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How Does E-Commerce Growth Influence the Traditional Retail in Kazakhstan?

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ABSTRACT

This paper examines how the growth of e-commerce influences traditional retail in Kazakhstan. While conventional theory often assumes that online retail substitutes for offline stores by lowering search costs, increasing price transparency, and expanding product choice, the evidence from emerging markets remains mixed. Kazakhstan presents an important case, as e-commerce has expanded rapidly in recent years, while traditional retail continues to play a significant role in the national economy. The study addresses this puzzle by combining macro-level and micro-level analysis.

At the macro level, the paper uses regional panel data for Kazakhstan over the period 2019-2024 to estimate the relationship between e-commerce volume and offline retail turnover. The empirical model is specified as a log-log OLS regression with controls for income per capita, population size, and inflation. The findings indicate a positive and statistically significant relationship between e-commerce growth and offline retail turnover: a 1% increase in e-commerce sales is associated with an approximately 0.13% increase in offline retail turnover. This suggests that, in Kazakhstan, e-commerce complements rather than replaces traditional retail.

At the micro level, the study draws on Central Asia Barometer survey data to explore individual patterns of e-commerce adoption across generational groups. The expected results suggest that younger cohorts, particularly Gen Z and Millennials, demonstrate higher levels of e-commerce adoption than older generations. Overall, the paper argues that e-commerce in Kazakhstan contributes to the transformation of retail toward a more integrated and hybrid model, rather than causing the decline of physical stores. These findings highlight the importance of local market conditions, consumer behavior, and digital development in shaping retail transformation.

KEYWORDS: e-commerce; traditional retail; Kazakhstan; retail transformation; consumer behavior; generational differences

INTRODUCTION

E-commerce is growing rapidly changing retail markets and their structure nowadays. Digital technologies lower search costs, develop logistics, and enhance price transparency, which could be the reason for switching from traditional offline retail to online resources. However, in some countries, offline retail shrinks, while on the other hand, in other countries it remains stable or grows. As the e-commerce in Kazakhstan has been rapidly developing in the past ten years, this study would be important to understand the trends and changes in retail: e-commerce is growing due to information technology and means of payment development, whereas offline stores still make a significant contribution to the country's economy.

LITERATURE REVIEW

One of the definitions of E-commerce describes that as a purchase and sale of goods and services over digital platforms, such as online search, payment, and delivery coordination (Chaffey, 2015). On the other hand, traditional retail can be defined as physical store-based format where transactions occur face to face (Levy at al., 2019). Different studies examine the interaction between these two channels and the influence of online retail development on the performance of offline stores. One of the main expectations supposes that e-commerce competes with traditional stores. As a consequence, traditional brick-and-mortar retail experiences declining sales, store closings, and overall the transformation of stores into purely electronics channels lowers search costs and offers enhanced assortment (Verhoef et al., 2015). Nevertheless, empirical evidence suggests that e-commerce is highly dependent on market structure, logistics, trust and internet literacy. Some consumers still prefer physical contact and proximity of traditional retailers, so in transition economies, they continue to experience sustained performance. In such economies, offline retails that also maintain their online presence are preferred. This is supported by evidence from Kazakhstan. An analysis of literature reveals that the adoption of e-commerce can spur the development of logistics, the use of hybrid models, as well as improvement in order processing systems, but this does not necessarily lead to a downfall of physical stores. This can be related to the explanation advanced by Tobakabylova et al. (2023) and Zhussupova et al. (2015), which suggests that online and offline spaces supplement but do 4 not substitute for each other, especially in an emerging market like Kazakhstan that has yet to develop trust as well as delivery networks among consumers. In general, there are no predictions of e-commerce development in Kazakhstan from the literature: it either substitutes traditional sales or develops alongside. This ambiguity justifies the empirical analysis that has been conducted as part of this project by analyzing how e-commerce growth relates to regional offline retail turnover with the use of macro-level data.

METHODOLOGY

The basis of this research is the regional panel data set for Kazakhstan for the period of 2019-2024. The data set comprises 20 regions and three major cities. The data is collected from the Bureau of National Statistics and comprises important economic and retail data.

The independent and dependent variables that are used in this research are:

- Dependent Variable: Offline retail turnover
- Independent Variable: E-commerce volume
- Control Variables: Income per capita, population size, and inflation

The regression that is used in this research is the log-log OLS regression. The coefficients obtained in this regression can be treated as elasticities. The data might be skewed because of the presence of extreme values. The log transformation helps in overcoming this problem.

The regression model used in this research is based on the cross-sectional and time variations. This helps in performing a robust analysis of the impact of the variations in the economic conditions and the level of digitalization.

The diagnostic tests that are carried out in this research to check the validity of the regression model are:

- Multicollinearity
- Heteroskedasticity
- Autocorrelation

- Normality of the residuals

Besides the macro-level analysis, this study also employs a micro-level analysis, where the study utilizes the Central Asia Barometer survey results (CAB, Wave 12, 2022), covering around 1,520 respondents. This allows for the analysis of individual-level factors of e-commerce adoption.

At the micro-level, the dependent variable measures e-commerce adoption (operationalized as the frequency of mobile internet usage), whereas the primary independent variable of interest is the generational cohort, including Gen Z, Millennials, Gen X, and Boomers.

EXPECTED FINDINGS

The results show that there is a positive relationship between e-commerce and offline retail turnover, which is statistically significant. This implies that if e-commerce sales increase by 1%, then the offline retail turnover increases by about 0.13%.

This implies that e-commerce is not a substitute but complements the offline retail sector in Kazakhstan. This could be explained by the potential positive impact of e-commerce on logistics and consumer engagement, which could be beneficial to the retail sector.

The results show that the control variables perform well. For instance, the positive coefficient of the income per capita implies that the more people are willing to spend, the larger the demand for retail. The positive coefficient of the population size implies that the larger the market size, the larger the retail turnover. The negative coefficient of the inflation rate implies that the more people are affected by inflation, the less they are willing to spend. The results show that the hypothesis that e-commerce is not a substitute but complements the offline retail sector is true.

At the micro level, the expected results imply that the younger generations, i.e., Gen Z and Millennials, are expected to have significantly higher levels of e-commerce adoption compared to older generations. This result is expected to hold even after controlling for digital literacy, education, and urbanization.

This would imply that demographic and behavioral factors are important determinants of e-commerce growth, and this result would complement the macro-level evidence.

CONCLUSION

One of the key contributions of this study is that it combines both macro-level and micro-level analysis. This is significant in that it provides a more comprehensive view of how e-commerce influences both markets and consumers.

This paper aims to explore the relationship between e-commerce development and offline retail in Kazakhstan using regional panel data and an econometric method. The findings indicate that, contrary to what is normally theoretically expected, e-commerce development is positively related with offline retail performance.

While e-commerce is not displacing traditional retail, it is contributing to its transformation in a way that is more integrated or hybrid. This is because of the significant role that local conditions play.

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Policy Transfer and Translation in Building Alatau City/SEZ: How the Policy Idea of a Global Special Economic Zone Model Travels to and Translates into Kazakhstan

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ABSTRACT

The proliferation of Special Economic Zones (SEZs) is a defining feature of global policy, yet Kazakhstan's experience reveals a "performance paradox" where imported models frequently fail due to local governance challenges. This study addresses the problem of "fragmented implementation", where sophisticated policy designs clash with administrative realities, resulting in inefficiencies such as overlapping mandates between ministries, local akimats, and management companies.

The launch of Alatau City represents a critical test of the state's capacity to overcome these institutional constraints. While existing literature discusses policy instruments and coordination in isolation, there is a lack of empirical research tracing how these factors intersect during the high-stakes launch of a new zone. This research seeks to fill that gap by showing how global policy instruments are translated into practice, identifying the specific coordination bottlenecks that undermine effective implementation.

KEYWORDS: Policy Tranfser, Policy Translation, Special Economic Zones

1 INTRODUCTION

The proliferation of Special Economic Zones (SEZs) represents one of the most significant trends in contemporary economic governance. By 2019, the United Nations Conference on Trade and Development (UNCTAD) estimated that more than 5,400 zones existed across 147 economies, a dramatic increase from 176 zones in 47 countries reported in 1986 (*UNCTAD, 2019*). Governments across Asia, Africa, the Middle East, and Latin America have adopted SEZ models as instruments for attracting foreign direct investment (FDI), stimulating export-oriented industrialization, and piloting regulatory reforms that can later be scaled nationwide (*Zeng, 2016*). Yet despite this enthusiasm, the empirical record remains decidedly mixed: a recent analysis by the European Bank for Reconstruction and Development (EBRD) suggests that only approximately 40% of SEZs can be named successful by any meaningful performance metric (*EBRD, 2024*).

In the grand scheme of things, Kazakhstan is in a very interesting place. Kazakhstan has used special economic zones (SEZs) as a policy tool since it became independent in 1991 to help its resource-based transitional economy diversify. *Astana Times (2025)* says that the country has 16 special economic zones spread out over 12 regions. These zones offer investors lower taxes, easier

customs processes, and ready-to-use industrial land. But problems with governance, not enough private sector involvement, and lack of openness have always kept the zones from reaching their full potential *(Charter Cities Institute, 2025; CAREC/ADB, 2018)*. The Asian Development Bank (ADB) did a full analysis and found systematic shortfalls across most performance indicators. They said these were caused by responsible agencies having overlapping mandates, management companies not having enough resources, and complicated administrative processes *(CAREC/ADB, 2018)*.

The newest and maybe most ambitious version of Kazakhstan's zone plan is Alatau City, which will open in 2023 as a new integrated SEZ in the Almaty Region. The project, which covers about 99,000 hectares and is divided into four themed districts: Gate (a financial and business center), Golden (a place for education and health care), Growing (a place for industrial manufacturing and logistics), and Green (a place for fun and relaxation), is meant to bring in about 3.7 trillion tenge in investments by 2048. Alatau City is going to be the first digital smart city and international business center in Central Asia. It has plans for a new international airport, three light rail transit lines, and a lot of other urban infrastructure. In September 2025, Presidential Decree No. 1015 made Alatau City a “city of accelerated development”, which meant that a constitutional law had to be written to set up the city's government.

Despite the sophistication of its legal design, Alatau City confronts a fundamental challenge that pervades the global SEZ landscape: the gap between policy design and practical delivery. The existing legal framework governing the zone is the 2019 Law on Special Economic and Industrial Zones and its associated regulatory instruments was designed for specialized industrial zones rather than a comprehensive city-type SEZ with urban, industrial, educational, and recreational functions. This structural misalignment creates what this paper terms a “performance paradox” that manifests across multiple governance dimensions.

This study fills in a big gap in the research: there isn't any in-depth research that looks at how SEZ policy instruments interact with local government facts during the crucial start-up of a new zone, especially in Central Asian settings. Some studies have looked at how policies get from one area to another (Dolowitz & Marsh, 2000; Stone, 2012), and others have looked at how well SEZs work in different areas (Farole, 2011; Zeng, 2016). But not many have looked at the specific "translation" process that happens when abstract policy designs meet the real-world limits of interagency coordination and bureaucratic capacity. Not much research has been done on how imported tools like tax breaks, one-stop shops, land-allocation processes, and regulatory provisions are interpreted, changed, or resisted by people in the country who have to work within certain institutional limits.

This study is based on the research question: How are Special Economic Zone (SEZ) policy is translated into practice within the governance of Alatau City/SEZ? The government has often used global growth models, often because they think they work in China or the UAE. However, not much research has been done on how these policies actually work in the local government. Not much study has been done on the specific “translation” process that happens when abstract policy designs meet the real-world limits of interagency coordination and bureaucratic capacity. Getting rid of this gap will help us understand why big development projects are often hard to carry out, even when there are strong legal systems in place.

2 LITERATURE REVIEW

2.1 Policy Transfer and Policy Translation Theory

The systematic study of policy transfer emerged in the 1990s, consolidated by Dolowitz and Marsh's *(1996)* foundational article defining policy transfer as "a process in which knowledge about policies, administrative arrangements, institutions and ideas in one time and/or place is used in the development of policies, administrative arrangements and institutions in another time and/or place" *(p. 344)*. Their next framework *(Dolowitz & Marsh, 2000)* organised research around seven questions: why people transfer, who transfers, what is transferred, where it comes from, how much is transferred, what limits there are, and how transfer affects policy results. This framework created a range of transfer levels, from willingly learning from mistakes to being forced to do so by international financial institutions. This range is especially important when it comes to SEZ adoption, where transfer is a mix of genuine learning, outside pressure, and strategic copying of successes seen elsewhere (Zeng, 2015).

When a policy is transferred, *Dolowitz and Marsh (2000)* found three main reasons why it doesn't work: uninformed transfer, which means the borrowing country doesn't know enough about the policy being transferred; incomplete transfer, which means important parts of the policy aren't transferred; and inappropriate transfer, which means the differences between the transferring and borrowing jurisdictions aren't taken into account enough. These categories offer a diagnostic language that can be directly applied to Kazakhstan's SEZ experience, where complex legal systems have often failed *(CAREC/ADB, 2018)*. *Ugyel and Daugbjerg (2020)* showed that successful transfer depends on strong internal motivation and the creation of institutions to manage transfer processes. This makes us wonder how much Kazakhstan's adoption of the SEZ is a reflection of domestic learning and how much it is just following international rules.

A big change in how people think about transfer is that they used to think of it as just copying policies, but now they think of it as active "policy translation" *(Stone, 2012)*. This perspective, informed by science and technology studies and actor-network theory, posits that policies do not merely shift between jurisdictions. Rather, they undergo active processes of reassembly, transformation, and reinterpretation as they traverse networks comprising diverse actors, institutional frameworks, and conceptual frameworks. *Clarke et al. (2015)* took this idea even further by showing how policies change through interpretation, contestation, and adaptation at every step of their trip. This reframing is critical for the present study: rather than asking whether Kazakhstan has "successfully" transferred a particular SEZ model, the translation perspective asks how specific policy instruments are interpreted, adapted, or resisted by local actors operating within specific institutional constraints.

In Central Asia, the policy translation point of view is especially important. *Liu, 2021* study of the China-Singapore Suzhou Industrial Park showed that both sides had to negotiate and adjust to changing ecosystems over the course of almost 30 years. This shows that successful transfer is not a one-time event but an ongoing process of learning within an organization. These results make it clear that more research needs to be done on the specific ways that SEZ knowledge gets to Kazakhstan's policymakers, such as through foreign consulting jobs, study trips, and partnerships between two governments.

2.2 Special Economic Zones: Global Models and Performance

Even though SEZs are common around the world, no one can agree on what they mean. The definition that is used most often for a SEZ is a clearly defined area with a single manager, location-based investor benefits, and a separate customs area with duty-free rules *(FIAS, 2008; Zeng, 2016)*.

This idea includes free trade zones, technology parks, transportation hubs, export processing zones, and zones the size of whole provinces *(UNCTAD, 2019)*.

China has the most well-documented and thoroughly researched experience with SEZs around the world. China's program started with four experimental zones in 1978 as part of Deng Xiaoping's "Open Door" policy. It later grew to include different types of zones all over the country. By the 2010s, Chinese SEZs at all levels accounted for approximately 22% of national GDP, 46% of FDI inflows, and 60% of exports (*Zeng, 2015*). Important factors for success included a strong commitment from the government along with practical steps that could be taken at a time, institutions that could act quickly on investor needs thanks to their independence, good infrastructure, and early on, broad-based tax breaks that helped the ecosystem grow before switching to more industry-specific approaches *(Zeng, 2016; Konysbek et al., 2021)*. Conversely, the Chinese model's transferability has been subject to scrutiny, as researchers have highlighted the challenges of replicating its success due to its distinctive political and economic context, robust state apparatus, investment networks among its diaspora, and gradual reform trajectory *(Farole & Moberg, 2014)*.

Central Asian policymakers might consider the Middle Eastern model, particularly Dubai's free zones, as a potential alternative. These zones in Dubai facilitate complete foreign ownership, offer tax exemptions, provide state-of-the-art infrastructure, and implement highly efficient regulatory frameworks *(UNCTAD, 2019)*. But experts warn that this model depends on certain factors that are hard to replicate in bigger political systems, like being in a transit hub position, getting money from sovereign wealth funds, and having a small, highly centralised government *(Farole & Akinci, 2011)*.

The accumulated global evidence presents what might be termed an "SEZ paradox": zones continue to proliferate despite largely disappointing results. The EBRD's Transition Report 2024-25 found that only 40% of zones could be classified as successful, and that among infrastructure factors, only port proximity significantly predicted success (*EBRD, 2024*). *Farole (2011)* showed that the amount of tax incentives had no discernible impact on performance, while the dependability of infrastructure was strongly linked to zone success around the world. This result is very important for Kazakhstan because SEZ policy has traditionally focused on giving businesses generous tax breaks while paying less attention to the quality of governance.

The lessons from zones that didn't work are just as useful. One of China's original four special economic zones, along with Shenzhen, was Shantou. It didn't do well for many years because policies were unstable, not enough money was spent on infrastructure, and institutions didn't work together well. Even though India put a lot of money into the Dahej SEZ at the start, it had problems because of too many rules, complicated ways to get land, and poor communication between federal and state governments. Malaysia's Delapan Special Border Economic Zone had trouble with bad facilities and not being clear about where it fit in the market. These failure cases all have things in common, like broken institutions, inadequate infrastructure, and problems matching policy design with implementation ability. These problems are very similar to the ones Alatau City is facing *(Zeng, 2015; CAREC/ADB, 2018)*.

2.3 SEZ Governance and Institutional Design

The government structure of SEZs has become an important but little-studied factor in determining how well the zones do. Interagency coordination is one of the biggest problems with governance that keeps coming up. For SEZs to work, trade, finance, land, labour, customs, and

environmental authorities all need to work together. But when these agencies work separately, implementation gets jumbled *(Farole & Akinci, 2011).*

The one-stop shop (OSS) concept has become synonymous with modern SEZ governance. Approximately one-third of SEZ laws globally include specific OSS provisions (*UNCTAD, 2019*). However, implementation is considerably more complex than design: providing a genuine single window requires "a well-structured investment regime, effective interagency collaboration and coordination, thorough investment process analysis, data harmonization and document simplification, as well as technical capacity in terms of IT infrastructure" (*UNCTAD, 2019*). This observation highlights the gap between the policy instrument as design concept and its practical delivery a gap frequently magnified in developing country contexts where interagency coordination mechanisms are weak.

The challenge of interagency coordination represents the most persistent governance obstacle in SEZ implementation globally. SEZs require aligned action from trade, finance, land, labor, customs, and environmental authorities. When these agencies operate in institutional silos pursuing different objectives, following different procedures, and reporting to different political principals the result is fragmented implementation. This problem is made worse in countries with multiple levels of government, where national policymaking and subnational application need to work together *(Farole & Akinci, 2011). Dorozynski et al. (2021),* using data from Poland's fourteen special economic zones, discovered that the quality of management companies in these zones significantly affected their performance. They also found that the stability of zone leaders, along with how much management companies spent on advertising and infrastructure, were important factors in attracting investment.

A second way that SEZs help with governance that is getting more and more notice from scholars is as policy laboratories or regulatory sandboxes. China's plan is based on using zones to test reforms that could then be applied across the whole country *(Zeng, 2011). UNCTAD, 2019* found examples of how governments used the limited scope of SEZs to test new policies with the help of foreign investors. This idea applies to Alatau City, which is set up to try out new ways of running the government. Presidential Decree No. 1015 set up a unique set of laws that are different from the usual national rules and regulations. It remains to be seen whether this leads to real policy innovation or just an exemption from stricter responsibility standards.

2.4 Kazakhstan's SEZ Experience and Alatau City

Kazakhstan has 16 SEZs. The 2019 Law on Special Economic and Industrial Zones and the Tax Code, Customs Code, and Land Code make up the laws that govern them. The structure of the incentives includes not having to pay company income tax, land tax, or property tax, getting zero-rated VAT on certain goods, making it easier to hire people from other countries, and getting duty-free customs treatment. The *CAREC/ADB (2018)* diagnostic, on the other hand, found systematic shortfalls due to overlapping mandates, weak management company ability, inadequate infrastructure investment, and complicated administrative processes. *Konysbek et al. (2025)* found important differences between Kazakhstan's more strict and centralised institutional environment and China's more flexible and decentralised SEZ governance.

Since it became independent, Kazakhstan's growth has been shaped by the task of diversifying its economy in a resource-rich one. The hydrocarbon sector has historically made up about a third of GDP and about two thirds of export income. It has oil reserves of about 30 billion barrels. Several strategic plans, such as Kazakhstan 2030, Kazakhstan 2050, and the State Program of Forced Industrial-Innovative Development, have been made by the government to encourage

development. SEZs have been a big part of all of these plans. But Kazakhstan's exports have stayed very focused, and the country is still not very good at coming up with new ideas *(OECD, 2017).* Because these problems keep happening, they make me wonder how well the institutions that have been used to implement diversification strategy, such as SEZs, have been working.

Kazakhstan's Special Economic Zones are run by a complicated system with many levels: zone control companies, central government ministries, and regional administrations. The Ministry of Industry and Construction is in charge of making and overseeing SEZ policies. The regional akimat in charge of that area is in charge of local implementation and building facilities. The management company is in charge of running the business and keeping investors happy. Over-centralization was named as a major problem by the OECD in 2017. They said that having most of the power to make decisions in a few central offices slows down the whole process of running the government. This means that management companies in SEZs often don't have the power to handle simple investor problems without going to higher-level groups.

Alatau City, which opened in 2024 with four functional districts and will be in use until 2048, is very different from Kazakhstan's past zones. The Alatau Master Plan, which was passed in May 2024, calls for three light rail lines, a new international airport, and planned urban growth that happens in stages until 2050. In September 2025, Presidential Decree No. 1015 gave the city special status as a "city of accelerated development", which meant that a constitutional law had to be made right away. The zone is divided into four different areas, each with its own purpose. The Gate District is a hub for finance and business, the Golden District is all about healthcare and education, the Growing District is for industry and logistics, including a new airport, and the Green District is for leisure and tourism. In 2026, investments hit about 250 billion tenge. However, the current legal system is set up for specialised industrial zones, which is not compatible with the project's larger, urban-scale goals. This study looks into the difference between bold design and the way things work in institutions.

3 METHODOLOGY

3.1 Research Design

This study employs a qualitative research design utilizing a single case study approach, selected as the most appropriate methodology for investigating how SEZ policy is translated into practice within a specific governance context. Alatau City/SEZ serves as the case, with specific policy instruments tax incentives, one-stop-shop services, land allocation mechanisms, and regulatory provisions examined as constituent elements of the translation process. The case study approach is particularly suitable given the thin empirical base for a zone still in its early implementation phase, where the research seeks to trace how global policy instruments are translated into practice and to identify the specific coordination bottlenecks that undermine effective implementation.

3.2 Data Collection

This conference paper draws primarily on document analysis as its empirical foundation. The documentary corpus includes: (a) the 2019 Law on Special Economic and Industrial Zones and its subsidiary regulations; (b) the Alatau Master Plan and associated government resolutions; (c) the Presidential Decree No. 1015 on the development of Alatau City; (d) official reports and

assessments of the SEZ legal framework; and (e) international benchmarking studies from UNCTAD, EBRD, the World Bank, and the Charter Cities Institute. The researcher's professional familiarity with the administrative context of Alatau City provides an additional interpretive lens, consistent with the insider-outsider positionality described below. Semi-structured expert interviews with officials, SEZ management personnel, investors, and policy experts are underway as part of the broader thesis research and will be incorporated into subsequent publications.

3.3 Data Analysis

A directed content analysis method is applied to the documentary data. Initial coding categories were derived from the research questions and the conceptual framework, while additional themes were generated inductively through repeated review of the legal texts and policy documents. The analysis traces each policy instrument from its legal definition through its operational design to identify points of misalignment between the framework's assumptions and Alatau City's actual governance requirements. The researcher's professional knowledge of the administrative environment informed the interpretive process, with reflexivity maintained through systematic recording of assumptions and potential biases.

3.4 Ethical Considerations

The broader thesis research, of which this paper forms a part, was approved by the KIMEP University Institutional Review Board (IRB) in November 2025. The IRB approval covers the semi-structured expert interviews that are currently underway. Ethical considerations for the interview phase include voluntary participation, informed consent, confidentiality, and anonymization. There are no target populations that are at risk, and the risk associated with the study is minimal. The selected approach is such that the research questions can be answered in a systematic way maintaining high ethical and methodological standards.

The researcher occupies an "insider-outsider" positionality, possessing professional familiarity with the local administrative context (insider) while maintaining analytic distance as an academic observer (outsider). This dual status informs the document analysis presented in this paper by enabling interpretation grounded in practical knowledge of how governance processes operate in the Kazakhstani context. At the same time, it carries the risk of "assumed understanding" that may lead to interpretive blind spots. To mitigate this, the researcher practices structured reflexivity and systematically records assumptions throughout the analytical process.

3.5 Limitations

Several limitations should be acknowledged. This paper presents preliminary findings based primarily on document analysis and the researcher's professional familiarity with the policy environment. While this foundation provides a robust basis for identifying structural misalignments in the legal framework, the analysis will be deepened through semi-structured expert interviews currently underway as part of the full thesis research. The policy environment is rapidly evolving, with the constitutional law under active development during the research period. These limitations are partially offset by the breadth of the documentary evidence base and the systematic cross-referencing of legal texts with international benchmarks.

4 FINDINGS

This section presents findings organized around six thematic areas of misalignment identified through systematic analysis of the legal framework governing Alatau City/SEZ, cross-referenced with international benchmarks and the Alatau Master Plan. Each subsection traces a specific dimension of the design–delivery gap, drawing on documentary evidence and the researcher's analytical interpretation to illustrate how imported policy instruments are shaped and often constrained by the existing institutional architecture.

4.1 Institutional Misalignment: A Framework Designed for Small Zones Applied to a City

One of the most important conclusions is that the current legal system doesn't work well with Alatau City's big plans for the city. The *2019 Law on Special Economic and Industrial Zones* was made for small, specialised industrial zones that focus on a few specific industries. Alatau City, on the other hand, is meant to be an integrated urban center that includes residential, educational, recreational, and economic uses spread out over almost 99,000 hectares. The law sets up a standard way for all 16 SEZs to be governed. This means that all 16 SEZs will use the same ways to delegate power, handle finances, and run their businesses, no matter how big or small their area is. This one-size-fits-all method was never meant to work with things as big and complicated as Alatau City.

The lack of a permanent national coordination tool makes this institutional misalignment stand out the most. An examination of the governance structure shows that decisions are made through central ministries, and there is no specific interagency body in charge of coordinating the many government players involved in running Alatau. Every day, the management company deals with issues that need input from more than one ministry. However, each problem has to be taken up through the formal administrative hierarchy one at a time. This setup might work in a normal industrial zone with limited needs for government oversight. It causes systemic delays for a city-type SEZ that needs unified action in dozens of areas at the same time, including urban planning, transportation, education, healthcare, and more. This coordination problem is made worse by the fact that the management company doesn't have much working freedom. The company's official job is to provide investment services and oversee zone operations, but it doesn't have the power to bind the central government on issues that are within its purview. It is important to note that these skills cover a lot more problems in a city-type SEZ compared to a normal industrial zone. This dynamic is reminiscent of the "dual track" governance problem documented in China's Shantou SEZ, where authority was split between an SEZ Administrative Committee and the municipal government, creating prolonged decision-making and coordination costs that ultimately discouraged international businesses from entering the market.

From the researcher's perspective, this institutional architecture reflects a deeper tension in Kazakhstan's approach to SEZ governance: the ambition to create something qualitatively new a comprehensive city-type zone while retaining the institutional template designed for something fundamentally different. The legal assessment of the SEZ framework confirms this diagnosis, noting that the current model requires transformation from managing a simple production site to governing a complex, multi-functional city. The absence of a mechanism for delegating additional central government competencies to the zone authority means that even routine matters must follow standard national administrative channels, regardless of whether those channels are equipped to serve the zone's accelerated development timeline.

International experience suggests a clear alternative. The recommendations emerging from the legal framework assessment call for establishing a high-level steering committee directly under the central government to coordinate inter-ministerial decision-making, while empowering local authorities with greater autonomy in economic matters. This would represent a significant departure from the current uniform governance template, but one that is arguably necessary given the qualitative difference between Alatau City and Kazakhstan's other SEZs.

4.2 The One-Stop-Shop: From Policy Concept to Delivery Reality

The principle of "one-stop" investor services exists in Kazakhstan's SEZ legislation and is central to Alatau City's governance design. The Entrepreneur Code establishes the "one window" principle with implementing rules, and digital platforms such as the National Digital Investment Platform (NDIP) and e-Licensing system provide electronic service channels. However, analysis of the institutional arrangements reveals a significant gap between this design concept and its operational reality. The one-stop-shop functions less as a single window for comprehensive investor services and more as a referral point that directs investors to the relevant government agencies.

The core issue is one of mandate versus capacity. The management company's formal authority covers registration functions and basic investor facilitation. For anything involving land allocation, tax matters, customs procedures, or construction permits, the matter must be referred to the relevant agency. Systems between agencies are not harmonized, which means the management company cannot access information from other ministries in real time. The result, in practice, is less a single window and more of a concierge service that makes appointments at different offices on the investor's behalf. This gap between the one-stop-shop as a legal concept and its operational delivery is not unique to Kazakhstan UNCTAD (2019) has emphasized that genuine single-window services require data harmonization, interagency coordination, IT infrastructure, and financial support that are frequently lacking in developing and transitional economies.

From a policy translation perspective, the one-stop-shop represents a case where the label has traveled successfully but the institutional substance has not. The concept was adopted from international best practice, but the interagency coordination mechanisms, data-sharing protocols, and delegated authority that make it functional in benchmark zones were not transferred alongside the formal provision. This observation aligns with the broader pattern of "incomplete transfer" identified throughout the analysis.

4.3 Fiscal and Tax Instruments: Narrow Preferences for a Broad Vision

The fiscal and tax regime applicable to Alatau City reveals a misalignment between the breadth of the zone's development vision and the narrowness of available incentive instruments. The current List of Priority Activities for SEZ Alatau contains only 31 sub-industry categories, concentrated in three domains: processing and manufacturing, warehousing and logistics, and construction. Sectors that are central to Alatau's development plan—finance, education, healthcare, IT, culture and tourism, digital services—are not covered. The priority activities list was drafted following the standard template used for all SEZs, which assumes that zones primarily need manufacturing enterprises to create stable employment. This template was not designed for a zone that must incentivize hospitals, universities, financial services firms, and digital economy companies simultaneously.

Additional fiscal constraints reinforce this narrowness. Zero-rated VAT applies only to goods consumed in operations rather than services a significant limitation for a zone aspiring to develop a services-oriented economy. There is no individual income tax relief for attracting skilled professionals, and no dedicated foreign investor incentives beyond national treatment. The legal framework assessment recommends expanding the priority activities list to match the zone's development plan, extending the 0% VAT regime from goods to services, establishing a "List of Priority and In-Demand Talents" with personal income tax preferences, and adopting a budget revenue-sharing mechanism more favorable to the local managing authority.

The international comparison is instructive. Successful city-scale zones tend to adopt broad-based incentive structures in their early phases to attract the critical mass of enterprises and talent needed to create a self-sustaining ecosystem. Hong Kong's simple, low-tax regime applies economy-wide. Singapore uses targeted innovation incentives across a wide range of sectors. Dubai's free zones offer comprehensive packages covering corporate tax, personal income tax, and customs duties. Alatau's current fiscal architecture, by contrast, offers a narrow set of instruments calibrated for conventional manufacturing zones, applied to what is intended to be a comprehensive urban economy.

4.4 Land Management: Sequential Leasing and Rigidity

Land management emerges as a critical area of misalignment creating constraints that affect both the management company's financial capacity and investors' long-term planning. Under the existing framework, land is provided through sequential leasing from local government to the management company, then to investors. The law does not expressly permit the management company to purchase state-owned land or to use it as collateral for financing. Most industrial investors must wait until the SEZ term expires before they may repurchase land. This inflexible supply arrangement lacks long-term property-rights certainty for industrial investors and constrains the management company's ability to conduct mortgage financing or capital operations necessary for mobilizing urban-development funds.

The practical implications of this rigidity are significant. Because the management company cannot leverage land assets, it is unable to use one of the most important financing mechanisms available to zone developers internationally. For the government, a "lease only, no sale" approach makes it difficult to obtain one-off revenues from land transfers for SEZ infrastructure investment and, especially after the SEZ matures, to capture the premium arising from land appreciation. Land management challenges also include weak idle-land enforcement, with a three-year waiting period before proceedings for withdrawal, and cumbersome expropriation procedures that constrain the dynamic needs of a city-scale development project.

The international comparison underscores the gap. In Shenzhen's early development phase, the local government retained all fiscal revenues locally and established state-owned development companies that used land assets as collateral for large-scale infrastructure financing. Shanghai's Pudong New Area similarly leveraged land transfer revenues to fund its rapid infrastructure buildout. Singapore's Jurong Town Corporation uses long-term land leases of 30, 60, or 99 years to balance centralized control over land resources with the practical needs of development. These mechanisms were essential to the financial viability of city-scale zone development. The absence of diversified land supply mechanisms represents one of the most significant gaps between Alatau's current legal framework and the institutional arrangements that enabled successful city-scale zones in Asia.

4.5 Temporal and Strategic Misalignment

The 25-year operating term of SEZ Alatau (through 2048) creates a temporal misalignment with the zone's development trajectory. The Alatau Master Plan phases urban construction through 2030, 2040, and 2050, with backbone road networks, rail transit, and municipal engineering systems scheduled for full completion by 2050 two years after the SEZ term expires. This means the SEZ status with its associated preferential policies would formally end before the city's infrastructure is fully built. A 25-year term simply does not cover the 30-to-50-year payback horizon typical of urban infrastructure investments, and no serious long-term investor will commit billions to a zone that might lose its preferential status before the investment is recouped.

None of the major international benchmarks for city-scale SEZs operate with a fixed expiry date. Shenzhen has been running for over 45 years and continues with no end date. Shanghai's Pudong New Area has operated for 35 years. China's Hainan Free Trade Port advances in stages to 2025, 2035, and 2050, with incentives continuing beyond 2050 and no fixed termination. The legal framework assessment recommends either extending the term to 50 years or more, or removing the fixed term altogether. This is not merely a technical adjustment but a fundamental question of investor confidence: the temporal horizon signals whether the state is committed to the long-term institutional stability that city-scale development requires.

The constitutional law process currently under development presents a critical opportunity to address this misalignment, either by extending the term substantially or by removing the fixed deadline altogether. From the researcher's perspective, the 25-year term reflects the same pattern observed across the other dimensions of misalignment: the application of a standard framework designed for conventional zones to a project that is qualitatively different in its ambition and time horizon.

4.6 International Openness: Barriers to Global Positioning

Despite its positioning as an international business center and Central Asian hub, Alatau City currently operates under a legal framework that applies nationwide restrictions on foreign investment, professional qualifications, labor mobility, and capital flows. No free customs zone has yet been established within the SEZ. Foreign equity holdings remain subject to nationwide caps, including a 20% aggregate cap in mass media, 49% in air transport, and 0% in private security services. Labor quotas restrict the proportion of foreign employees to 30% for senior management positions and 10% for specialist roles. There is no operative mechanism for recognizing international professional qualifications. Foreign exchange and cross-border financing are subject to strict regulation.

This relatively conservative opening model raises the entry and operating costs of foreign-invested enterprises, increases barriers to the movement of capital and technology, and is not conducive to attracting high-end talent. The successful international zones Dubai, Singapore, Hong Kong all share one characteristic: they removed barriers to the movement of capital, talent, and goods as a foundational principle, not as an afterthought. The legal framework assessment recommends that, beyond affirming national treatment, the framework should grant more favorable treatment in priority fields, diversify settlement and financing channels, and establish systems for dedicated quotas for foreign personnel, long-term visas, and a catalog of recognized international qualifications. Without these measures, Alatau's aspiration to function as a genuinely international

hub remains constrained by institutional arrangements that were not designed with global openness as a priority.

5 DISCUSSION

5.1 Policy Translation in Action

The findings reveal that Alatau City represents a case of what *Dolowitz and Marsh (2000)* term "incomplete transfer". Sophisticated policy instruments SEZ legislation, tax preferences, one-stop-shop provisions, land allocation mechanisms were formally adopted, but critical elements that enabled the success of benchmark zones were not transferred. Specifically, the institutional autonomy that allowed Shenzhen's authorities to respond rapidly to market conditions, the broad-based fiscal regimes that supported ecosystem development in Singapore and Hong Kong, and the unrestricted foreign investment frameworks that attracted global capital to Dubai were not incorporated into Alatau's governance architecture.

The policy translation perspective (*Stone, 2012*) shows why this incompleteness is not simply an oversight but a structural outcome of the transfer process. SEZ policy instruments did not travel intact from their originating contexts to Kazakhstan. They were filtered through the country's centralized governance traditions, limited culture of delegating authority to subnational entities, and narrow fiscal policy tools calibrated for conventional industrial zones. The result is a hybrid governance arrangement that bears formal resemblance to international models the legal texts reference one-stop shops, preferential tax regimes, and investor facilitation, but diverges substantially in operational substance. *Clarke et al.'s (2015)* concept of policy "mutation" captures this dynamic: the policies have changed form as they moved between contexts, retaining their labels while acquiring fundamentally different operational characteristics.

This finding extends the policy translation literature by demonstrating that translation is not merely a matter of local adaptation but can involve structural constraints that systematically filter out specific policy elements. In Alatau's case, the elements most consistently filtered out: broad fiscal discretion, genuine institutional autonomy, liberal foreign investment provisions are precisely those that challenge Kazakhstan's centralized governance model. This suggests that policy translation is shaped not only by the technical capacity of recipient institutions, but by the political economy of the receiving context, which determines which elements of imported models are "translatable" and which are resisted at the systemic level.

5.2 Implications for Adaptive Governance

The findings suggest that successful implementation of Alatau City's development vision requires not wholesale transplantation of any single foreign model but adaptive governance of discrete policy instruments aligning legal frameworks to the actual scale and ambition of the zone while learning selectively from international experience. The constitutional law process mandated by *Presidential Decree No. 1015* represents a critical window for systemic recalibration.

International experience offers instructive precedents. China's approach to SEZ governance has been characterized by pragmatic incrementalism a willingness to experiment with policy instruments in confined geographic spaces, evaluate outcomes, and adjust frameworks based on evidence *(Zeng, 2016)*. Shenzhen's institutional evolution from a small experimental zone to a comprehensive metropolitan area involved continuous recalibration of governance mechanisms as

the zone's scale and complexity increased. Singapore's unified economic agencies demonstrate an alternative path: concentrating planning, investment promotion, and regulatory functions in a single streamlined institutional structure that minimizes coordination costs.

6 CONCLUSION

This study traced how SEZ policy is translated into practice within the governance of Alatau City/SEZ, finding major areas of misalignment between the current legal framework designed for specialized industrial zones and the needs of a comprehensive city-type SEZ: institutional coordination gaps, fiscal and tax narrowness, one-stop-shop delivery challenges, land management rigidity, temporal mismatch between the SEZ term and urban development horizons, and international openness limitations.

The study makes three contributions. Theoretically, it provides empirical evidence from an understudied Central Asian context that extends policy transfer and translation theory. The findings demonstrate that the gap in Alatau City is structural rather than merely operational the legal architecture itself was calibrated for a different type of zone, making the gap a product of the transfer process rather than an implementation failure per se. This supports the policy translation perspective's emphasis on how institutional contexts actively shape and filter imported policy instruments, and demonstrates that some elements of successful international models may be systematically "untranslatable" within specific governance traditions.

Methodologically, the study demonstrates the value of tracing specific policy instruments from legal definition through actual delivery as a technique for identifying where and why imported governance models diverge from their intended operation.

Practically, the findings point to several concrete policy directions that merit consideration within the constitutional law process currently under development.

Several limitations should be acknowledged. This paper presents preliminary findings based primarily on document analysis and the researcher's professional familiarity with the governance environment. Semi-structured expert interviews currently underway as part of the broader thesis research will deepen and nuance these findings. The policy environment is rapidly evolving, and the constitutional law under development may address some of the misalignments identified here. Future research should adopt a longitudinal approach, tracking how the constitutional law's provisions once enacted translate into governance practice over time, and whether the adaptive governance mechanisms established prove sufficient to close the gaps identified here. Comparative studies examining parallel reform processes in other Central Asian states implementing SEZ programs would also contribute to the theoretical generalizability of the findings.

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Risk signals and corporate resilience: Weather alerts, firm value, and the role of sustainability committees

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Abstract

We examine whether persistent exposure to weather alerts, as institutionalised signals of climate risk, is associated with firm value. Using data on UK Met Office alerts, we document a negative relationship between the annual frequency of weather alerts and firm value. This effect is more pronounced for severe (red) alerts and for alerts related to wind, snow, and ice hazards. The negative valuation effect is amplified for firms in weather-vulnerable industries and for alerts linked to named storms, which attract more public attention and increase salience. We find evidence that higher operating expenses constitute a partial channel through which weather alerts are associated with reduced firm value, consistent with firms incurring precautionary costs in response to increased climate risks. Importantly, firms with sustainability committees experience a significantly weaker negative effect, particularly when such committees exhibit greater independence and gender diversity, highlighting the role of governance in mitigating exposure to weather-related risks. Overall, our findings show that weather alerts function as economically meaningful climate risk signals and highlight the role of governance in shaping firm resilience.

JEL classification: G30; G34; M41

Keywords: Firm value; Climate risk; Risk signals; Sustainability committee; Weather alerts

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Downsizing and Firm Performance: Evidence on Distributive and Procedural justice

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Abstract

This study revisits the performance consequences of workforce downsizing during a period of substantial economic disruption, emphasising the theoretical roles of distributive and procedural justice within firms. We argue that CEO–employee pay disparity, made more salient through recent pay disclosure regulations, heightens distributive fairness concerns that undermine the legitimacy of managerial actions and weaken the performance benefits that downsizing can generate. We further propose that board independence helps counteract these concerns by strengthening procedural justice through more credible oversight and fair, transparent decision-making. Drawing on 1,067 firm-year observations from FTSE 350 firms between 2019 and 2024, we find that downsizing is positively associated with subsequent firm performance, but that this effect is significantly attenuated when the CEO–median employee pay gap is larger. Consistent with our framework, board independence mitigates the negative moderating role of pay disparity. These findings are robust to alternative measures of downsizing, firm performance, and governance, as well as to potential sample selection and endogeneity concerns. Overall, the study demonstrates how distributive and procedural justice mechanisms jointly shape the effectiveness of downsizing and highlights the importance of managing internal pay structures and governance arrangements during turbulent periods.

Keywords: Downsizing, Organisational Justice, CEO–to-Median Employee Pay Ratio, CEO–Employee Pay Disparity, Economic Disruption

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Climate Change Exposure and Managerial Discretion

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ABSTRACT

Despite growing attention to corporate climate risk, empirical evidence on whether firms' climate change exposure influences managerial discretion remains limited. Using a sample of UK listed firms from 2002 to 2024, this study examines the relationship between climate change exposure and income smoothing. The results reveal that climate change exposure is negatively associated with income smoothing, indicating that firms facing greater climate-related risks tend to engage in less income smoothing. The results remain robust to alternative measures and endogeneity concerns. Overall, this study is among the first to provide new evidence on the role of firm-level climate risk in shaping financial reporting behavior and provides strong support that corporate climate change exposure can significantly constrain managerial discretion over time, particularly in a stringent regulatory environment such as the United Kingdom.

KEYWORDS: Climate change exposure, income smoothing, managerial discretion, sustainability, United Kingdom

Managerial Perceptions and the Strategic Positioning of Public Relations in Kazakhstan's B2B Logistics Sector

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ABSTRACT

This paper examines how senior managers in Kazakh business-to-business (B2B) logistics firms perceive public relations (PR), focusing on three dimensions: managerial perceptions of PR's strategic value, perceived structural positioning, and perceived strategic integration. Drawing on upper echelons theory and the normative–descriptive gap framework, the study addresses an underexplored empirical context: an emerging economy, a non-Western institutional environment, and a B2B sector in which communication serves coordination and trust functions across institutional partners rather than consumer-facing brand promotion. An exploratory, cross-sectional survey was administered to senior managers and communications professionals at 42 Kazakhstan-based logistics firms, using a 20-item Likert instrument organized into three composite indices. Results reveal a clear normative–descriptive gap: endorsement of PR's strategic value is near-universal and compressed against the ceiling, while perceived structural positioning and strategic integration are considerably lower and far more dispersed. The weakest-endorsed items concern formal decision authority and pre-decision consultation, suggesting that PR is perceived as present in organizational processes but not yet authoritative within them. Firm size produced no meaningful differences; internationally owned firms scored modestly higher on the Perception index, though this contrast is confounded with firm type. The most consistent correlate of perceived embeddedness was the presence of a dedicated in-house PR function. Structural positioning and strategic integration were empirically difficult to separate, behaving largely as a unified PR-embeddedness dimension. The findings extend the normative–descriptive gap to a new institutional and sectoral context and suggest that the principal challenge for PR in Kazakh B2B logistics is converting widespread belief in PR's value into formal authority and genuine decision-making access.

KEYWORDS: public relations; managerial perceptions; B2B communication; Kazakhstan; logistics sector; strategic positioning

1 INTRODUCTION

1.1 Background

Strategic communication scholarship has, for two decades, documented a persistent puzzle: senior managers and the firms they lead say that public relations is a strategic function (Grunig & Grunig, 2000; Tench et al., 2009; Zerfass et al., 2022), yet the structures and decision-making

behaviors of those same firms often treat PR as a tactical service (Berger, 2005; Moss et al., 1996; Reber & Berger, 2006). Macnamara's (2023) review of global communication-leadership research finds that majorities of senior managers endorse the principle that PR contributes to long-term success and reputation, while only a minority of communication functions actually report to senior leadership or participate in strategic decisions. The European Communication Monitor reports the same disjunction across more than 40 countries (Zerfass et al., 2022). Volk et al. (2024) frame the gap as a value-recognition paradox: communication is widely believed to drive intangible firm value, yet it is rarely organizationally placed where it could most influence decisions about that value.

This normative–descriptive gap has been the empirical centerpiece of Western strategic communication research (Grunig & Grunig, 2000; Moss et al., 1996; Reber & Berger, 2006; Macnamara, 2016). It is interpreted as evidence that managerial perception alone is insufficient to elevate communication's organizational role, and that something else — organizational inertia, professional turf, leadership templates — intervenes between belief and structure (Meng & Berger, 2022). Two observations make this gap relevant beyond its original Western contexts. First, the empirical evidence underlying the gap is overwhelmingly from North America, Western Europe, and Australia — mature institutional environments with established PR professional bodies, standardized managerial templates, and consumer-facing industries where reputation has long been a quantifiable concern. Whether and how the same pattern is observable in emerging economies, where institutional environments are still consolidating and managerial templates are not yet locked in, has not been described (Sriramesh & Verčič, 2019). Second, the gap has been documented predominantly in consumer-facing sectors — FMCG, financial services, telecoms — where PR's value is most legibly tied to brand and reputation (Anani-Bossman, 2022; Zerfass et al., 2023). In B2B sectors, where communication serves coordination and trust functions across institutional partners rather than brand-promotion functions toward end consumers, both the perception of PR and its structural placement may follow a different logic (Balmer et al., 2020; Hingley et al., 2015). These two observations motivate the present study, which describes how senior managers in Kazakh B2B logistics firms perceive PR; how they describe its structural positioning and strategic involvement in their firms; and how perceptions vary across firms of different size and ownership.

1.2 Sector Context: Kazakhstan and the Logistics Industry

Kazakhstan provides a relevant empirical context for examining the organizational role of public relations. The country serves as a key transit hub between Europe and Asia and handles a significant share of overland transit between China and Europe (Kushkumbayev & Satpayev, 2022). Three features make this setting analytically distinctive for a study of managerial perceptions of PR. First, the institutional environment is in transition: regulatory frameworks, professional norms, and managerial templates are still consolidating, which means perceptions of communication functions are not yet locked into the patterns documented in mature Western markets (Bokayev et al., 2022; Filipov, 2024). Second, ownership is mixed. Locally owned firms with centralized owner-led decision structures coexist with subsidiaries of international corporations that import formalized communication practices from headquarters (Mahmood & Alimanov, 2023; OECD, 2023). This creates within-country variation that allows perceptions across these two organizational templates to be compared in a single study. Third, the B2B sector itself is operationally complex (Davis et al., 2011). It requires continuous interaction with diverse stakeholders — suppliers, customers, infrastructure operators, customs authorities, and regulatory agencies (Wu et al., 2023). Transactions in the B2B industry are high-value, involve multiple

decision-makers, and depend on long-term trust-based relationships (Hingley et al., 2015). Communication facilitates this trust through transparency, information sharing, and relationship management (Grönroos, 2015), serving functions distinct from the brand-promotion focus that has dominated consumer-oriented PR research. Balmer et al. (2020) argue that corporate identity and communication are critical for differentiation in industries where service quality is intangible and dependent on coordination across multiple actors. Kazakhstan's evolving institutional environment, diverse ownership structures, and business-to-business operational model together position the logistics sector as a significant context in which to study managerial perceptions of PR.

1.3 Problem Statement and Research Gap

To date, no systematic empirical evidence appears to exist on how senior managers in Kazakh B2B logistics firms perceive public relations, despite three features of this setting that make it analytically distinctive (Grunig & Grunig, 2000; Macnamara, 2016; Moss et al., 1996; Reber & Berger, 2006). Kazakhstan's logistics sector combines an institutional environment still in active consolidation, where governance arrangements, professional norms, and managerial role expectations remain in formation (Mahmood & Alimanov, 2023; OECD, 2023); a predominantly inter-organizational B2B operating context in which communication supports coordination, reciprocal feedback, relationship quality, and trust across organizational partners; and a mixed ownership structure in which locally controlled firms coexist with foreign-owned firms and multinational subsidiaries shaped by more formalized organizational templates. These conditions differ from the organizational settings that dominate existing perception-of-PR research, which has been developed primarily in Western contexts and more consumer-facing sectors. While existing scholarship on Kazakhstan has examined corporate governance reform, institutional modernization, and communication capacities within governance and administration (Temirbayev & Abakanov, 2019), it has not systematically explored how senior managers in private-sector B2B firms conceptualize public relations as a strategic organizational function. This gap is especially relevant in the logistics sector, where firms depend on inter-organizational coordination, trust-based relationships, and sustained stakeholder engagement rather than primarily consumer-facing communication. This study addresses this Kazakhstan-specific, B2B-sector, and manager-focused gap directly, by describing how senior managers in Kazakh logistics firms perceive PR's strategic role, structural positioning, and involvement in strategic decision-making, and by examining how those perceptions vary across firms of different size and ownership.

1.4 Research Purpose, Research Questions, and Significance

The purpose of this study is to describe how senior managers in Kazakh B2B logistics firms perceive public relations, how they describe its structural positioning and strategic involvement in their firms, and how those perceptions vary across firm characteristics. The study is descriptive and exploratory; it does not test causal effects. Four research questions guide the study, with a fifth, exploratory question examining co-variation among the perceptual domains:

- RQ1. How do senior managers in Kazakh B2B logistics firms perceive PR's strategic vs. operational character?
- RQ2. How is the structural positioning of PR perceived within these firms (reporting line, leadership access, authority, resources)?

- RQ3. To what extent is PR perceived to be involved in strategic decision-making, crisis communication, and stakeholder engagement?
- RQ4. How do these perceptions vary by firm size and ownership structure (locally owned vs. internationally owned)?
- RQ5 (exploratory). How do the three perception domains co-vary within respondents? Because all three are measured by self-report from a single respondent per firm, this analysis describes co-variation among managerial perceptions, not causal links among organizational variables.

Academically, the study extends descriptive evidence on managerial perceptions of PR to an underexplored empirical context — an emerging economy and a B2B industry — addressing the Western-centric and consumer-oriented bias in current research. Practically, the findings may help logistics firms understand how their senior staff currently view PR, where perceived gaps lie between PR's strategic potential and its actual involvement, and how these perceptions vary across firms of different size and ownership.

2 LITERATURE REVIEW

2.1 The Normative–Descriptive Gap in Strategic PR

Public relations have been theorized as a strategic management function for at least two decades (Grunig, 2006). Contemporary scholarship attributes four interrelated functions to PR: stakeholder management (Andersson & Wikström, 2023), reputation management (Volk et al., 2024), legitimacy maintenance (Ditlevsen & Ihlen, 2024), and advisory input to strategic decision-making (Macnamara, 2023). At the level of managerial endorsement, this view is widely accepted; at the level of organizational practice, it is widely unrealized. Macnamara's (2023) review of the global communication-leadership literature documents the consistent finding that majorities of senior managers report perceiving PR as a strategic function while only a minority of communication functions actually report to senior leadership, hold formal decision authority, or participate in strategic-planning episodes. The European Communication Monitor, the largest cross-national survey of communication professionals, reports the same pattern across more than 40 countries (Zerfass et al., 2022). Volk et al. (2024) observe that this gap persists despite robust evidence that intangible assets — reputation, legitimacy, stakeholder trust — account for a substantial proportion of firm value, particularly in industries exposed to public scrutiny.

The gap, taken as a stable empirical pattern, has shaped the field's research agenda toward asking what mechanisms produce or sustain it. Three classes of explanation appear in the literature. The first locates the cause in managerial cognition: senior leaders may endorse PR's strategic value abstractly while not converting that endorsement into resource-allocation or decision-inclusion behaviors (Meng & Berger, 2022). The second locates the cause in organizational inertia: even when leadership shifts toward a more strategic view of PR, structures, reporting lines, and budgets adjust slowly and incompletely (Dozier et al., 1995; Zerfass et al., 2022). The third locates the cause in professional and sectoral templates: in some industries and national contexts, the dominant template for organizing communication is technical and promotional, and individual managerial perceptions are insufficient to override it. The present study cannot adjudicate among these three explanations, but each predicts that the gap should manifest differently in a context where the templates are not yet locked in — precisely the case for emerging-economy B2B logistics.

2.2 Managerial Cognition and Upper Echelons

Upper echelons theory (Hambrick & Mason, 1984) provides a framework for thinking about why managerial perceptions are theoretically important even when they appear to be only loosely coupled to organizational practice. The theory holds that organizational outcomes reflect the cognitive bases and values of senior leaders. Applied to communication, it implies that managerial beliefs about PR's purpose are linked — eventually and imperfectly — to resource allocation, communication authority, and inclusion in strategic discussions. The looseness of this coupling is itself the empirical phenomenon the present study is designed to describe. Meng and Berger (2022) refine this by distinguishing leadership expectations (what senior leaders believe PR should do) from leadership decisions (what senior leaders allow PR to do). Their argument is that the two are correlated but not identical, and that the divergence between them is the cognitive component of the normative–descriptive gap. In the present study, Section A of the instrument captures expectation-type perceptions, Section B captures positioning-type perceptions, and Section C captures behavioral-involvement perceptions. The relationships among these three — both their average levels and the configurations they form — are the study's central object of description.

2.3 Structural Positioning of PR

Structural positioning in this study refers to where PR sits in an organization's formal architecture as perceived by senior managers — reporting relationships, access to leadership, decision authority, and resource adequacy (Dozier et al., 1995; Zerfass et al., 2022). Departments perceived to be positioned closer to senior management are theorized to participate more substantively in strategic processes, but the empirical record is clear that this association is far from deterministic: many firms report formally elevated communication functions that nonetheless do not participate in strategic decisions, and some firms report informally consultative communication functions despite weak formal positioning. Because positioning is measured by perception rather than by external organizational records, results describe how senior managers see the placement of PR — itself a meaningful object of study — rather than the objective placement.

2.4 Strategic Integration of PR

Strategic integration refers to PR's involvement in organizational decision-making — strategic-planning discussions, crisis communication, stakeholder advice, and shaping the organization's response to external issues (Macnamara, 2023). In the present study, integration is captured through senior managers' perceptions of these involvements within their firms. Structural positioning and strategic integration are conceptually distinct: the former captures where PR sits in the formal architecture, the latter captures how PR is involved in decision-making processes. As Section 5 shows, however, this conceptual distinction is not always cleanly recovered in the empirical data, and the possibility that the two constructs behave as a single 'PR-embeddedness' dimension is treated explicitly as a finding rather than assumed away.

2.5 The Kazakh B2B Logistics Setting and What to Expect

Whether the normative–descriptive gap appears in Kazakh B2B logistics firms in the form documented in Western evidence depends on whether the conditions theorized to produce or

sustain the gap apply here. The literature suggests three considerations relevant to forming descriptive expectations for the present study.

2.5.1 Institutional environment

Mature Western markets — where the gap was originally documented — feature established PR professional bodies, decades of internalized managerial templates for organizing communication functions, and a strong norm that communication should be "seen as" strategic even when it is not structurally treated as such. Kazakhstan's institutional environment is in active consolidation: regulatory frameworks for transport and trade are evolving, professional communication bodies are emerging rather than entrenched, and managerial templates are being imported, adapted, and contested rather than inherited (Bitabarova, 2018; Kushkumbayev & Satpayev, 2022). One implication is that perceptions of PR in this setting may be more variable across managers and firms than in mature markets, because they depend more on individual cognition and less on inherited templates.

2.5.2 Sectoral logic

In B2B logistics, communication serves coordination and trust functions across institutional partners — suppliers, customers, infrastructure operators, customs authorities — rather than the brand-promotion functions that have shaped consumer-oriented PR research (Hingley et al., 2015; Grönroos, 2015; Balmer et al., 2020). One implication is that managers in this sector may endorse PR's strategic role specifically in coordination and crisis terms more than in brand or visibility terms.

2.5.3 Firm-level heterogeneity: ownership and size

Internationally owned firms typically import managerial templates from headquarters that may include formalized communication functions, dedicated reporting lines, and established practices for involving communication in strategic and crisis decisions (Sriramesh & Verčič, 2019). Locally owned firms, by contrast, tend toward more centralized, owner-led decision-making in which communication is less likely to be a separate strategic function. Larger firms tend to formalize organizational functions more than smaller firms (Hambrick & Mason, 1984). These contrasts motivate the comparison of managerial perceptions across ownership and size under RQ4.

2.6 Conceptual Orientation

The study describes three perceptual domains and compares them across firm characteristics: managerial perceptions of PR — how senior managers view PR's strategic vs. operational character (Section A; RQ1); perceived structural positioning of PR — how senior managers describe where PR sits in their firm and what authority and resources it has (Section B; RQ2); and perceived strategic integration of PR — how senior managers describe PR's involvement in strategic, crisis, and stakeholder decisions (Section C; RQ3). These three domains are described separately (RQ1–RQ3), compared across firm size and ownership (RQ4), and explored for bivariate co-variation (RQ5). They are not modeled as a causal chain.

3 METHODOLOGY

This section specifies the operational details of the study. Section 3.1 covers the research design; Section 3.2 covers sampling and recruitment; Section 3.3 the unit of analysis; Section 3.4 the instrument; Section 3.5 operationalization; Section 3.6 the data-analysis plan; and Sections 3.7–3.8 cover limitations and ethical considerations.

3.1 Research Design

This study adopts a quantitative, cross-sectional, descriptive–exploratory research design. The aim is to describe how senior managers in Kazakh B2B logistics firms perceive PR (RQ1–RQ3), to compare those perceptions across firm characteristics (RQ4), and to explore how the three perception domains co-vary (RQ5). The study does not test causal effects and does not claim that any one perception causes another. All three constructs are measured by self-report from a single senior respondent per firm, and findings are interpreted accordingly. A self-administered online survey is used, deployed via an online survey platform with mobile-responsive formatting. This delivery mode is appropriate because (a) the target respondents are senior managers whose availability for in-person interviews is limited, (b) online deployment supports the multi-language deployment described in Section 3.4, and (c) it permits efficient reach across the geographically dispersed Kazakh logistics sector.

3.2 Population, Sampling, and Recruitment

The target population comprises logistics firms operating in Kazakhstan and registered under OKED codes 49–52 (transportation and storage). Within these firms, the unit of observation is the senior manager or communication professional with current knowledge of communication practices: CEO/COO/commercial director, marketing manager, PR/communications manager, or equivalent. A non-probability purposive sampling strategy is used, drawing on the membership directory of KazLogistics (the Association of National Forwarders of Kazakhstan), the Ministry of Transport public registry of licensed transport and freight-forwarding firms, and direct outreach via LinkedIn and industry contacts. The recruitment plan aimed for roughly balanced representation across firm size (small/medium <250 employees vs. large ≥250) and ownership (local vs. international, where international = ≥50% foreign ownership). Each sampled firm received a personalized email or LinkedIn message in Russian and Kazakh, identifying the researcher and university, summarizing the study, linking to the online survey, stating the estimated completion time (10–12 minutes), and offering an aggregate sector benchmark report as a non-monetary incentive; one reminder was sent two weeks after first contact. The study was designed as an exploratory survey; recruitment aimed for the largest achievable sample within the fieldwork window rather than a fixed statistical target. The realized sample was N = 42 firms. This exceeds the rule-of-thumb minimum of roughly 30 cases for exploratory quantitative work but is underpowered for detecting small-to-medium group differences: the independent-samples comparisons under RQ4 are sensitive only to large effects (Cohen's d of roughly 0.60–0.80 at α = .05, two-tailed). These power limitations are acknowledged throughout and in Section 3.7, and all group comparisons are read as descriptive rather than confirmatory.

3.3 Unit of Analysis

The unit of analysis is the firm, represented by a single senior respondent per firm. Where multiple responses were received from the same firm, only the response from the most senior communications-relevant role was retained for analysis.

3.4 Instrument

3.4.1 Structure and item sources

Data were collected with a structured online questionnaire of 20 substantive Likert items, organized in three thematic blocks (Managerial Perceptions of PR, 7 items; Perceived Structural Positioning, 5 items; Perceived Strategic Integration, 8 items), plus a respondent and firm profile of six items. All Likert items use a uniform 5-point scale (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree). Section A (Managerial Perceptions of PR) is adapted from Meng and Berger's (2022) leadership and communication-excellence research, capturing normative beliefs about PR's strategic role. Section B (Perceived Structural Positioning) is informed by the European Communication Monitor reporting-structure framework (Zerfass et al., 2022). Section C (Perceived Strategic Integration) draws on Macnamara's (2023) strategic-role conceptualization. All statements are positively worded.

3.4.2 Scoring, translation, and pilot testing

The realized instrument contains no reverse-coded items; a higher score always indicates stronger endorsement, more developed structural positioning, or greater strategic integration. Reverse-keyed items were considered at the design stage but were not retained in the fielded questionnaire; the implications of all-positive wording for acquiescence bias are discussed in Sections 4 and 5. Following the measurement logic specified in the instrument, three index scores are computed as the unweighted mean of the items in each block: Perception Index = mean of the 7 items in Block A; Positioning Index = mean of the 5 items in Block B; Integration Index = mean of the 8 items in Block C. The instrument was translated into Russian and Kazakh by bilingual translators familiar with the logistics sector and reviewed for clarity by sector contacts before fielding, and was administered in both languages, with items presented in a consistent thematic order within each block. A pilot of approximately 30 respondents drawn from the same population was conducted before main fieldwork; pilot data supported item-level statistics, preliminary internal-consistency estimates, timing checks, and qualitative feedback on item clarity, and were not included in the main analysis.

3.5 Operationalization

Table 1 specifies the role of each construct in the study, the number of items, the response anchors, and the scoring rule.

Table 1. Operationalization of constructs

Construct	Role	Items	Scoring
Managerial Perceptions of PR (Perception Index)	Primary descriptive focus (RQ1)	7	Mean of Block A items (5-pt Likert)

Construct	Role	Items	Scoring
Perceived Structural Positioning (Positioning Index)	Descriptive focus (RQ2)	5	Mean of Block B items (5-pt Likert)
Perceived Strategic Integration (Integration Index)	Descriptive focus (RQ3)	8	Mean of Block C items (5-pt Likert)
Firm size	Grouping variable (RQ4)	1	Small/medium (<250) vs. large (≥250 employees)
Ownership structure	Grouping variable (RQ4)	1	0 = local; 1 = international (≥50% foreign owned)
Controls (descriptive only)	Profile only	3	Activity type, respondent role, years in role

3.6 Data Analysis Plan

Analysis was conducted in either jamovi or SPSS, both of which provide a standard menu-driven interface for the descriptive statistics, reliability analysis, t-tests, and correlations used in this study; output was exported and archived to support replication, and statistical procedures followed Boateng et al. (2018) for scale-validation best practices. Analysis proceeded in five stages. Stage 1, data screening, inspected distributions, missingness patterns, and out-of-range values; responses with very fast completion times or obvious patterned responding (e.g., the same answer for all 20 items) were reviewed and flagged. Stage 2, reliability, computed Cronbach's α for each of the three composite scales, treating $\alpha \geq .70$ as acceptable (Boateng et al., 2018) and inspecting corrected item-total correlations. Stage 3, descriptive statistics, reported means, standard deviations, and percentage agreement for each Likert item, and means, standard deviations, and 95% confidence intervals for each index (RQ1–RQ3). Stage 4, group comparisons, used independent-samples Welch t-tests to compare each index across (a) firm size and (b) ownership, reporting group means, mean differences, t-statistics, p-values, and Cohen's d, with Mann–Whitney U as a non-parametric robustness check (RQ4); because the realized sample is sensitive only to large effects, non-significant results are not interpreted as evidence of no difference. Stage 5, exploratory correlations, reported Pearson and Spearman correlations among the three indices; because all three are measured by the same respondent at the same time, correlations describe how perceptions of PR cluster within respondents and are not interpreted as causal effects of organizational variables (RQ5). Table 2 summarizes this analytic mapping.

Table 2. Summary of analytical procedures by research question

Question	Procedure	Reporting
RQ1–RQ3	Descriptive statistics per item (mean, SD, % agreement) and per index (mean, SD, 95% CI)	Item- and index-level tables; brief narrative interpretation

Question	Procedure	Reporting
RQ4	Welch t-tests per index by firm size and ownership; Mann–Whitney U as robustness check; Cohen's d	Group means; mean difference; 95% CI; d; p; narrative on direction/magnitude
RQ5 (exploratory)	Pearson and Spearman correlations among the three indices	Correlation matrix with significance; narrative framed as descriptive co-variation, not causation

3.7 Limitations

Three limitations are acknowledged at the design stage and revisited in light of the results in Section 5.3. First, the cross-sectional design captures perceptions at a single point in time; findings describe how managers currently view PR, not how perceptions change or what shapes them over time (Maxwell & Cole, 2007). Second, all three constructs are measured by self-report from a single senior respondent per firm, raising same-source bias and common-method-variance concerns: a respondent's general attitude toward PR is likely to color responses across all three sections, inflating the apparent co-variation among the indices (Podsakoff et al., 2003). The descriptive–exploratory framing is itself the principal mitigation, because no claim is made that one perceptual variable causes another. Third, despite the registry-based and stratified recruitment described in Section 3.2, purposive sampling cannot fully approximate a probability sample; results are interpreted as analytically generalizable to similar B2B logistics contexts in Kazakhstan rather than as population estimates, and power for detecting small group differences ($d < 0.30$) under RQ4 is limited at the realized sample size ($N = 42$), so a non-significant test does not rule out a small true difference.

3.8 Ethical Considerations

Ethical approval was obtained prior to any data collection. Participation was voluntary; respondents received an informed-consent statement covering purpose, procedures, expected duration (10–12 minutes), voluntary nature, the right to withdraw at any time without consequence, and contact details for the researcher and the institutional ethics committee. Only respondents aged 18+ were eligible. Firm identifiers and respondent name (where given) were stored in an encrypted lookup table separate from response data, accessible only to the principal researcher; this lookup table was destroyed after data collection closed. Analysis and reporting used aggregated, pseudonymized data only. Data were stored on password-protected, encrypted devices and on the institutional restricted-access cloud, retained for the period required by institutional policy and then securely deleted.

4 RESULTS

This section reports the findings of the exploratory survey following the analysis plan set out in Section 3.6 (Stages 1–5). Given the small realized sample, the results are presented and interpreted as exploratory and descriptive: emphasis is placed on item- and index-level description,

effect sizes, and 95% confidence intervals, and the inferential tests under RQ4 and RQ5 are read as hypothesis-generating rather than confirmatory.

4.1 Instrument, Data Screening, and Sample Profile

Data were collected with a self-administered online questionnaire in Russian and Kazakh comprising 20 substantive statements, each rated on a 5-point Likert scale, together with a short profile section. Across the two language versions, 43 questionnaires were returned (42 in Russian, 1 in Kazakh); one Russian respondent declined consent and was removed, leaving 42 cases for analysis (41 Russian, 1 Kazakh). Item-level missingness was negligible (one missing cell on one item). Four respondents gave the same answer to all 20 items (all "5"); these are flagged as potential straight-lining and are retained in the main analysis but examined separately in the robustness check (Section 4.4). Completion time was self-reported in broad bands, which limits its use as a careless-response filter; 17 respondents reported under five minutes.

Two profile variables were used as grouping factors. Ownership was recorded in four categories and grouped for analysis as domestic — private-local plus state/quasi-state firms (n = 27 excluding the joint venture for some tabulations, n = 29 for the binary RQ4 comparison) — versus international/transnational firms (n = 12); the single joint venture is set aside from the binary ownership comparison. Firm size, recorded in employee bands, was grouped as small/medium (≤250 employees, n = 28) versus large (>250, n = 14). Seniority, years operating, presence of a dedicated PR function, and PR-head gender were also recorded and are used descriptively (Table 3).

Table 3. Sample profile (n = 42)

Characteristic	Category	n (%)
Seniority	Senior management / Middle management	18 (43%) / 24 (57%)
Company type	Private-local / State-quasi-state / International / Joint venture	19 (45%) / 10 (24%) / 12 (29%) / 1 (2%)
Firm size	Small/medium (≤250) / Large (>250)	28 (67%) / 14 (33%)
Years operating	<5 / 5–15 / >15	7 / 21 / 14
Dedicated PR function	Yes / No / Handled by parent	27 / 10 / 5

Two cross-tabulations describe the structure of the sample and show that the variables later used as grouping factors are not independent of one another. Company type and firm size are strongly associated: every private-local firm is small or medium, whereas state/quasi-state and international firms are predominantly large (binary ownership × size, Fisher's exact p = .068; Table 4). Firm size therefore largely stands in for firm type in this sample, so the size and ownership comparisons reported in Section 4.3 cannot be cleanly separated — a difference attributed to one could equally reflect the other.

Table 4. Company type by firm size — counts (row %)

Company type	Small/medium	Large	Total
Private-local	19 (100%)	0 (0%)	19
State / quasi-state	3 (30%)	7 (70%)	10
International	5 (42%)	7 (58%)	12
Joint venture	1 (100%)	0 (0%)	1
Total	28	14	42

A dedicated in-house PR function is most common among state/quasi-state firms (80%) and least common among private-local firms (53%), consistent with greater formalization in larger, state-linked organizations (Table 5).

Table 5. Company type by dedicated PR function — counts

Company type	Has own PR	No PR	By parent	% own PR
Private-local	10	6	3	53%
State / quasi-state	8	1	1	80%
International	9	3	0	75%
Joint venture	0	0	1	—
Total	27	10	5	

Internal consistency was acceptable to good for all three composites (Table 6); consistent with the small-sample caveat noted in Section 3.7, each coefficient is reported with a 95% confidence interval and treated as provisional.

Table 6. Internal consistency of the three composites

Composite	Items (k)	Cronbach's α	95% CI
Perception	7	.79	[.67, .88]
Positioning	5	.83	[.73, .90]
Integration	8	.90	[.84, .94]

4.2 Descriptive Findings and the Normative–Descriptive Gap (RQ1–RQ3)

At the index level, managerial perceptions of PR's strategic value are high and tightly clustered (M = 4.36, SD = 0.56), while perceived structural positioning (M = 3.69, SD = 0.97) and strategic integration (M = 3.88, SD = 0.93) are lower and far more dispersed (Table 7). All three sit above the scale midpoint of 3, but the distributions differ in kind: endorsement of PR's value is near-universal and compressed against the ceiling — no respondent scored below 2.0 and roughly two-thirds fall in the top band — whereas perceived positioning spreads across the whole scale,

with about 30% of firms (12 of 41) rating PR as poorly positioned. The substantively interesting variation in these data therefore lies in positioning and integration, not in whether managers value PR.

Table 7. Index-level descriptives (n = 42)

Index	Mean	SD	95% CI
Managerial Perceptions (RQ1)	4.36	0.56	[4.19, 4.53]
Structural Positioning (RQ2)	3.69	0.97	[3.39, 3.99]
Strategic Integration (RQ3)	3.88	0.93	[3.59, 4.17]

The normative–descriptive gap. Managers endorse PR's strategic value more strongly than they report PR being structurally embedded or behaviourally involved: on average Perception exceeds Positioning by 0.67 points (paired $t = 5.07$, $p < .001$) and Integration by 0.48 ($t = 4.05$, $p = .0002$). At the individual level, however, the gap is a majority rather than a universal pattern — 69% of respondents personally score Perception above Positioning and 62% above Integration — and the median gaps (+0.43 and +0.25) are roughly half the means, inflated by a minority of large-gap respondents (Table 8). The pattern is best read as a ceiling effect on belief rather than a symmetric divergence of two independently varying quantities: because almost everyone strongly endorses PR's value, the Perception index is compressed near the top, while the lower and more variable positioning and integration scores open up the difference. The gap is not, however, an artefact of response style — it correlates negatively with each respondent's overall positivity ($r \approx -.5$), the opposite of what acquiescence would produce. With these qualifications, the belief-outruns-practice disjunction documented in Western, consumer-facing settings is visible here in an emerging-economy B2B context.

Table 8. Within-respondent normative–descriptive gap (n = 42)

Contrast	Mean gap	Median gap	% with positive gap
Perception − Positioning	+0.67	+0.43	69%
Perception − Integration	+0.48	+0.25	62%

Item-level patterns (RQ1). Endorsement of PR's value is broad: the most strongly agreed items are that long-term firm value depends on reputation (M = 4.62; 90% agree), that partner trust is as important as operational efficiency (4.60; 88%), and that PR requires professional management knowledge (4.57; 86%). The lowest perception item is the normative claim that the PR head should be a key strategic advisor (4.05; 71%) — still high.

Item-level patterns (RQ2–RQ3). The weakest items overall concern concrete decision involvement and authority: only 45% agree that management consults PR before key decisions (M = 3.31), 48% that the PR head has formal authority (3.40), and 50% that the CEO informally consults PR (3.52). By contrast, PR's presence in cross-functional teams (4.33; 79%) and the use of PR data in strategy (4.05; 74%) are comparatively high. The pattern suggests PR is perceived as present and consulted, but less often as holding formal authority or a seat at the decision table. Table 9 reports the full item-level breakdown by construct.

Table 9. Item-level descriptives by construct (n = 42)

Construct	Item (abbreviated)	Mean	SD	% agree
Perception	PR is a key management function (not support)	4.21	0.87	76
Perception	Long-term value depends on reputation	4.62	0.66	90
Perception	PR head should be key strategic advisor	4.05	1.10	71
Perception	Partner trust as important as operational efficiency	4.60	0.70	88
Perception	PR needed for KZ regulatory environment	4.21	0.90	74
Perception	Transparency = commercial success	4.24	0.97	78
Perception	PR needs professional knowledge	4.57	0.74	86
Positioning	PR specialist has necessary competencies	3.88	1.15	62
Positioning	PR reports directly to chair/CEO	3.83	1.38	64
Positioning	PR has its own budget	3.81	1.27	60
Positioning	PR head has formal authority	3.40	1.25	48
Positioning	CEO informally consults PR	3.52	1.33	50
Integration	PR in annual strategic planning	3.79	1.35	64
Integration	Mgmt consults PR before key decisions	3.31	1.28	45
Integration	PR identifies supply-chain risks early	3.64	1.32	55
Integration	PR builds international partner relations	3.79	1.28	64
Integration	PR consulted on government/regulators	3.69	1.28	55
Integration	PR in cross-functional teams	4.33	0.95	79
Integration	Mgmt uses PR data in strategy	4.05	1.10	74
Integration	PR goals tied to business goals	4.45	0.92	86

4.3 Exploratory Group Comparisons (RQ4)

Each composite was compared by firm size and by ownership using Welch t-tests with Mann–Whitney U as a robustness check, reporting mean differences with 95% CIs and Cohen's d (Table 10). With groups of roughly 12–28, these tests are underpowered for all but large effects; the confidence intervals are correspondingly wide and most straddle zero, so results are read as tentative.

Firm size. No meaningful differences emerged. All effect sizes are small ($|d| \leq 0.20$) and every confidence interval comfortably includes zero, so the data give no indication that small/medium and large firms differ on any composite. As Section 4.1 showed, size is also confounded with firm type, so a size comparison here is only weakly distinct from an ownership one.

Ownership. International/transnational firms scored higher than domestic firms on Perception (4.60 vs. 4.24; d = 0.64), a difference that reached nominal significance (Welch p = .043) with a 95% confidence interval that just excludes zero, though the rank-based test was only marginal (Mann–Whitney p = .081); there was no comparable ownership difference on Positioning or Integration (both $|d| \leq 0.17$). The direction would fit the idea that internationally owned firms import more formalized communication templates, but the comparison rests on only twelve international firms and, as noted, ownership is confounded with size, so the contrast cannot be attributed to ownership as such. It is at most a hypothesis for a larger study, not a robust finding.

What accounts for the variation. Because the firm-level comparisons are confounded and underpowered, no measured firm characteristic cleanly explains the wide spread in perceived positioning and integration. The largest single contrast is that firms with an in-house PR function score higher on Positioning than those with no PR or PR handled by a parent company (d = 0.74), whereas firm size (d = 0.00) and ownership (d = −0.08) are essentially null for positioning. Even this is not decisive — several of the lowest-positioning firms do have a dedicated PR function — so the most defensible reading is that the measured characteristics account for little of the substantial between-respondent variation, which is itself the dominant feature of the data.

Table 10. Exploratory comparisons by firm size and ownership

Index	Means (grp1/grp2)	Diff	95% CI of diff	d	p (t / MWU)
By firm size — Perception	4.34 / 4.41	−0.07	[−0.48, 0.34]	−0.13	.721 / .510
By firm size — Positioning	3.69 / 3.70	−0.01	[−0.68, 0.65]	−0.01	.965 / .968
By firm size — Integration	3.94 / 3.77	+0.17	[−0.52, 0.86]	+0.18	.616 / .697
By ownership — Perception	4.25 / 4.60	−0.35	[−0.69, −0.01]	−0.64	.043 / .081
By ownership — Positioning	3.63 / 3.73	−0.10	[−0.74, 0.54]	−0.10	.752 / .966
By ownership — Integration	3.83 / 3.99	−0.16	[−0.89, 0.58]	−0.17	.657 / .574

Size: small/medium (n = 28) vs. large (n = 14). Ownership: domestic (n = 29) vs. international (n = 12). Positive difference = group 1 higher.

4.4 Correlations Among the Composites (RQ5)

All three composites are positively and moderately-to-strongly inter-correlated, and Pearson and Spearman estimates agree closely (Table 11). They are reported as describing how perceptions cluster within a single respondent, not as evidence of an organizational mechanism, and at n = 42 the confidence intervals are wide. The strongest association is between perceived positioning and perceived integration (r = .69): managers who see PR as structurally embedded also tend to see it as behaviourally involved. Perception is more weakly tied to positioning (r = .48) than to

integration (r = .56), echoing the gap finding — belief in PR's value travels only partway into perceived placement.

Table 11. Pearson (Spearman) correlations among the three composites

Pair	Pearson r [95% CI]	Spearman ρ	p
Perception – Positioning	.48 [.20, .68]	.45	.001
Perception – Integration	.56 [.31, .74]	.58	<.001
Positioning – Integration	.69 [.49, .82]	.70	<.001

Two cautions temper RQ5. First, the associations are inflated by a general response-positivity (halo) factor: each composite correlates strongly with the respondent's mean across all 20 items (r = .74 to .93, highest for Integration), and once that overall positivity is partialled out, the inter-composite correlations collapse, leaving little construct-specific covariation. Second, positioning and integration may not be empirically distinct — their observed correlation of .69 rises to roughly .80 when disattenuated for reliability, implying they share most of their true-score variance and behave largely as a single 'PR-embeddedness' dimension. The sample is too small for a trustworthy factor analysis to settle this (42 cases for 20 items, well below the usual minimum), so the separation of positioning and integration should be treated as a conceptual distinction rather than one confirmed in these data.

4.5 Robustness Check and Summary

Robustness. The conclusions are stable under sensitivity checks. Excluding the four straight-lining respondents (all-"5" answers; n = 38) shifts the index means only slightly (Perception 4.29, Positioning 3.55, Integration 3.76) and leaves the overall picture intact: Perception remains compressed near the ceiling while positioning stays the most dispersed composite. The normative–descriptive gap persists and, if anything, widens (Perception − Positioning = 0.74; Perception − Integration = 0.53), which is consistent with reading it as a ceiling-on-belief effect rather than the product of a few inattentive respondents. The inter-composite correlations likewise remain moderate-to-strong (e.g., Positioning–Integration r = .62), though they carry the same general-positivity caveat noted above and should not be taken as evidence of distinct, separately varying constructs. Finally, the one firm-level pattern that survives — firms with an in-house PR function rating Positioning higher than those without (3.93 vs. 3.25) — matches the d = 0.74 reported in Section 4.3, reinforcing that perceived embeddedness, not firm size or ownership, is where the meaningful variation lies.

To summarize: RQ1 managers perceive PR predominantly as strategic, with near-universal and ceilinged endorsement of its value. RQ2 perceived structural positioning is more modest and, crucially, far more variable — weakest on formal authority and direct consultation — and it is the main axis on which firms differ. RQ3 perceived strategic integration is intermediate, but it carries little signal independent of general response positivity and is hard to separate empirically from positioning. RQ4 there are no size differences; the one ownership contrast that reached nominal significance — higher Perception in international firms — is confounded with size, rests on twelve firms, and is not robust, while the largest single correlate of positioning, having an in-house PR function, is itself only suggestive. RQ5 the three domains co-vary positively, but much of that

covariation reflects a general-positivity factor rather than distinct constructs. The clearest picture is therefore not a set of group differences but this: senior managers in Kazakh B2B logistics firms almost uniformly endorse PR's strategic value, yet differ widely in how embedded PR actually is, variation that the measured firm characteristics explain only weakly.

5 DISCUSSION

This section interprets the findings reported in Section 4 in relation to the study's three research questions (RQ1–RQ3), its comparative question (RQ4), and its exploratory co-variation question (RQ5). Three headline findings emerge from the data. First, managers in this sample endorse PR's strategic value near-universally — belief is high, compressed against the ceiling, and leaves almost no room for variation — while perceived structural embeddedness is markedly lower and far more dispersed, reproducing the normative–descriptive gap documented in Western, consumer-facing PR research within a new institutional and sectoral context. Second, the real variation across firms resides in how embedded PR is perceived to be, not in how much it is valued, and the firm characteristics measured — size and ownership — explain little of that embeddedness variation. Third, the two embeddedness constructs — perceived structural positioning and perceived strategic integration — were empirically difficult to separate, behaving largely as a single dimension in these data. Each of these findings is developed in the subsections that follow.

5.1 Principal Findings: Answering the Research Questions

The normative–descriptive gap (RQ1–RQ3). The headline result of this study is a clear and consistent gap between what managers believe PR should be and what they describe PR as actually being in their firms. Endorsement of PR's strategic value is near-universal and ceilinged: the Perception index reached M = 4.36 (SD = 0.56), no respondent scored below 2.0, and roughly half fell in the top response band. The most strongly endorsed items were that long-term firm value depends on reputation (M = 4.62; 90% agreement), that partner trust is as important as operational efficiency (M = 4.60; 88%), and that PR requires professional management knowledge (M = 4.57; 86%). Even the weakest perception item — that the PR head should be a key strategic advisor to the CEO — was endorsed by 71% of respondents (M = 4.05). Managers in this sample, in short, overwhelmingly regard PR as a legitimate strategic function.

Against that ceilinged belief, perceived structural positioning and strategic integration are both lower and far more variable. The Positioning index reached M = 3.69 (SD = 0.97) and the Integration index M = 3.88 (SD = 0.93) — both above the scale midpoint, but with standard deviations roughly twice that of the Perception index, and with roughly 21% of firms (9 of 42) rating PR as poorly positioned. On average, Perception exceeded Positioning by 0.67 points (paired $t = 5.07$, $p < .001$) and exceeded Integration by 0.48 points ($t = 4.05$, $p = .0002$). At the individual level the gap was a majority but not a universal pattern: 69% of respondents personally scored Perception above Positioning, and 62% above Integration, with median gaps of +0.43 and +0.25 respectively — roughly half the means, inflated by a minority of large-gap respondents. The belief-outruns-practice disjunction is therefore real and substantial, but heterogeneous: a minority of firms show little gap at all.

The texture of the gap is at least as telling as its overall size. The items with the lowest endorsement are precisely those that mark genuine organizational authority: only 45% of respondents agreed that management consults PR before key decisions (M = 3.31), 48% that the

PR head holds formal authority (M = 3.40), and 50% that the CEO informally consults PR (M = 3.52). By contrast, items describing PR's presence and data use — that the PR team is embedded in cross-functional project groups (M = 4.33; 79% agreement) and that management uses PR data in strategy development (M = 4.05; 74%) — are among the highest-rated items in the entire instrument. PR, in these managers' perceptions, is present and consulted but not yet authoritative: it is at the table but not consistently given a deciding voice.

RQ4: Variation by firm size and ownership. The study set out to test whether perceptions differ across firm size and ownership. The clearest finding from the group comparisons is that neither characteristic explains much. Firm size produced no meaningful differences on any composite (all $|d| \leq 0.20$; all confidence intervals comfortably including zero). International/transnational firms scored higher than domestic firms on Perception ($d = 0.64$), a difference that reached nominal significance (Welch $p = .043$, with a confidence interval just excluding zero), though the rank-based test was only marginal ($p = .081$); there was no comparable ownership difference on Integration ($d = 0.17$). This signal must still be treated with caution: it rests on only twelve international firms, and — critically — ownership is strongly confounded with size in this sample. Every private-local firm is small or medium; state/quasi-state and international firms are predominantly large (Fisher's exact $p = .068$). Any apparent size effect and any apparent ownership effect are therefore largely indistinguishable from one another, and neither was decisive. The one firm-level pattern that survived robustness checks was that firms with a dedicated in-house PR function perceived PR as better structurally positioned than firms without such a function ($d = 0.74$ on the Positioning index). Even this is suggestive rather than conclusive — several of the lowest-positioning firms do have a dedicated PR function — and the association is partly tautological: if a function is formally established, managers naturally rate its structural position more favorably. The net reading of RQ4 is that measured firm characteristics account for little of the substantial between-firm variation in perceived embeddedness.

RQ5: Co-variation among the three domains. All three composites are positively inter-correlated (Perception–Positioning $r = .48$; Perception–Integration $r = .56$; Positioning–Integration $r = .69$), and Pearson and Spearman estimates agree closely. The strongest association — between Positioning and Integration ($r = .69$, rising to approximately .80 when disattenuated for reliability) — suggests that managers who see PR as structurally embedded also tend to see it as behaviourally involved, and that the two constructs may function as a single PR-embeddedness dimension rather than two distinct organizational properties. Two cautions are essential. First, all three composites share method variance from a single respondent, and each correlates strongly with that respondent's overall mean across all 20 items ($r = .74$ to .93, highest for Integration); once general response positivity is partialled out, the inter-composite correlations collapse substantially, leaving little construct-specific covariation. Second, the sample ($n = 42$) is too small for a trustworthy factor analysis to adjudicate this. RQ5 is therefore reported as descriptive and heavily caveated: the correlations describe how one person's perceptions cluster, not how organizational variables are causally linked.

5.2 Findings in Relation to Theory

The normative–descriptive gap. The most directly supported theoretical framework is the normative–descriptive gap itself (Grunig & Grunig, 2000; Macnamara, 2016; Reber & Berger, 2006). This gap — managers endorse PR's strategic value while organizational structures and decision practices fall short — was originally documented in North American and Western European, predominantly consumer-facing settings. The present data show that the same pattern is

visible in an emerging-economy, B2B, non-Western institutional context. This is not a replication in the strict sense — the study is exploratory and the sample small — but the direction of the finding is unambiguous: belief is ceilinged and near-universal, while perceived positioning and integration are lower, more variable, and weaker specifically on the authority and pre-decision consultation items that mark genuine strategic influence. The contribution is therefore a boundary-condition extension: the gap is not limited to the institutional and sectoral contexts in which it was first described.

Upper echelons theory and the loose coupling of belief and practice. Hambrick and Mason's (1984) upper echelons theory, as adapted to PR by Meng and Berger (2022), frames the gap as a loose coupling between what senior leaders expect PR to do (endorsement) and what they allow PR to do (resource allocation, decision access). The present data are a direct illustration of this loose coupling. Belief in PR's value is near-universal and leaves almost no room to vary; what varies substantially across firms is the degree to which that belief translates into structural positioning and behavioral involvement. The pattern is precisely what the theory predicts: endorsement is necessary but not sufficient to produce embeddedness, and the gap between the two is itself the empirical phenomenon. The fact that this loose coupling appears in an institutional environment that is still in active consolidation — where managerial templates for organizing communication are being imported and contested rather than inherited (Mahmood & Alimanov, 2023; OECD, 2023) — is consistent with the expectation in Section 2.5.1 that perceptions would be more variable here than in mature Western markets.

Power, authority, and the dominant coalition. Berger's (2005) framework distinguishing "power over," "power with," and "power to" relations provides a useful lens for reading the item-level texture of the gap. The items with the weakest endorsement concern formal authority and pre-decision consultation — the markers of "power over" (the PR head has formal authority; management consults PR before key decisions; the CEO informally consults PR). The strongest endorsement goes to items describing cross-functional presence and data use — closer to "power with" and "power to" (PR is part of cross-functional teams; management uses PR data in strategy). PR is perceived, in these firms, as having been admitted to organizational processes but not yet granted decisive authority within them. This reading aligns with Reber and Berger's (2006) finding that communication practitioners frequently occupy informally influential but formally constrained roles.

Firm-level heterogeneity: ownership and size expectations. Section 2.5.3, drawing on Sriramesh and Verčič (2019), anticipated that internationally owned and larger firms would show more formalized PR structures, reflecting headquarters-imported managerial templates. This expectation is neither confirmed nor refuted at this sample size. The ownership contrast ($d = 0.64$ on Perception; $d = 0.17$ on Integration) reached nominal significance on Perception ($p = .043$) but rests on only twelve international respondents, with a confound between ownership and size that cannot be disentangled. The honest reading is that, in a sample of this size with this collinearity, the data do not permit a verdict on the Sriramesh–Verčič expectation. Whether the formalization advantage of internationally owned or larger firms materializes in Kazakh B2B logistics remains an open empirical question for a larger and better-powered study.

5.3 The Shape of the Gap: Near-Universal Belief, Variable Embeddedness

The normative–descriptive gap in these data is best understood not as a symmetric tug-of-war between two freely varying quantities, but as a ceiling-on-belief pattern. Because almost every respondent strongly endorses PR's strategic value, the Perception index is compressed near the top

of the scale (SD = 0.56; no respondent below 2.0) with little room to vary. The genuine between-firm variation is not in belief but in embeddedness: roughly 21% of firms rate PR as below the scale midpoint on the Positioning composite, and the Positioning and Integration indices carry standard deviations of 0.97 and 0.93 respectively — substantially larger than Perception's. The gap is therefore partly a structural artefact of this ceiling: when belief is near-universal, any shortfall in positioning or integration automatically opens a gap, even when both constructs are themselves reasonably high.

This reading carries a substantive implication. The interesting empirical question for this sector is not whether managers value PR — they do, almost without exception — but why embeddedness varies so substantially across firms that share a similar belief environment. What makes some firms perceive PR as well-positioned and others as poorly positioned, when both sets of managers express the same commitment to PR's strategic value? That question is beyond the scope of the present descriptive study but is a natural next step for future research (Section 5.6).

One possible objection to the gap finding is that it simply reflects a general tendency to agree with positively framed statements — acquiescence bias, or a halo over the entire questionnaire. The data provide internal evidence against this reading: the within-respondent gap between Perception and Positioning correlates negatively with each respondent's overall positivity across all items ($r \approx -.5$). That is, the respondents most prone to high overall scores show the smallest gap, not the largest. If acquiescence were producing the pattern, the opposite would be expected — higher overall endorsers would show wider gaps because they are agreeing more indiscriminately. The observed negative correlation is the signature of a genuine perceptual distinction, not a response-style artefact. Taken together, these observations suggest a typological reading in which the most common configuration in this sample is "high-belief / variable-embeddedness," where near-universal normative endorsement of PR's value coexists with a wide spread in whether PR is actually structurally placed and behaviourally involved. Embeddedness — the combination of positioning and integration — is the axis on which firms in Kazakh B2B logistics most meaningfully differ from one another.

5.4 Why Firm Characteristics Explained So Little

The study's most instructive null is not an absence of results but a finding in its own right: the measured firm characteristics — size and ownership — carry almost no explanatory weight for perceived embeddedness. Three reasons account for this, and each carries an implication. First, confounding. In this sample, size and firm type are nearly the same variable: every private-local firm is small or medium, while state/quasi-state and international firms are predominantly large (Fisher's exact $p = .068$). Any comparison of size groups is therefore simultaneously a comparison of ownership types, and vice versa; neither variable can be cleanly separated from the other. Second, statistical power. With groups of twelve to twenty-eight respondents, the tests reported in Section 4.3 are sensitive only to large effects (roughly Cohen's $d \geq 0.60$–0.80). The null findings for firm size (all $|d| \leq 0.20$) are inconclusive rather than disconfirmatory: they are consistent with a true null, but equally consistent with small-to-medium effects that a larger, better-powered study would detect. Non-significance at this sample size does not license the conclusion that size does not matter.

Third, and most substantively: what did track perceived embeddedness was not a broad structural category but a specific organizational feature — having a dedicated, in-house PR function. Firms with such a function rated Positioning higher than those without one ($d = 0.74$), while size ($d = 0.00$) and ownership ($d = -0.08$) were essentially null for the same composite. This

finding is partly tautological — a formally established function is almost by definition one that managers rate as structurally present — but it points toward a practical lever that broad categorical variables miss. The implication, consistent with the institutional argument in Section 2.5.1 (Mahmood & Alimanov, 2023; OECD, 2023), is that in a sector whose managerial templates are still in formation, formalization of PR may be driven more by firm-specific choices and organizational histories than by the category of ownership or size the firm happens to occupy. This is a hypothesis for later work, not a confirmed result: the dedicated-PR contrast is suggestive but not decisive — several of the lowest-positioning firms do have a dedicated function.

5.5 Measurement and Conceptual Reflections

Structural positioning and strategic integration were conceived in Section 2 (Sections 2.3 and 2.4) as conceptually distinct dimensions of PR's organizational role — the former capturing where PR sits in the formal architecture, the latter capturing how PR is involved in decision-making processes. The empirical data bear this out less cleanly than anticipated: the observed correlation between the Positioning and Integration composites is $r = .69$, and when this is corrected for measurement error using each composite's Cronbach's α, the disattenuated correlation rises to approximately .80. Two constructs sharing the bulk of their estimated true-score variance are difficult to treat as empirically distinct, and the robustness check (Positioning–Integration $r = .62$ excluding straight-liners) does not substantially alter this picture.

This does not mean that the distinction is conceptually meaningless. Positioning and integration capture different aspects of PR's organizational reality — formal reporting relationships versus behavioural involvement in decisions — and a larger, better-designed instrument might separate them more cleanly. But in these data, and with this sample, they behave largely as a single "PR-embeddedness" dimension. The practical implication for future measurement is that instruments studying PR's organizational role in similar contexts should either explicitly test the two-factor versus one-factor structure with adequate sample sizes, or include items that are more diagnostically distinct — for example, items targeting formal reporting lines (a structural feature largely independent of day-to-day behavioural involvement) versus items targeting specific decision episodes (a behavioural feature that can occur without formal authority).

A second measurement issue concerns general response positivity. Each composite correlates strongly with the respondent's overall mean across all 20 items (r ranging from .74 to .93, highest for Integration), indicating a substantial halo or acquiescence factor running through the questionnaire. This is a known hazard of all-positive-wording instruments (Podsakoff et al., 2003), and the present instrument included no reverse-keyed items. Future iterations should incorporate reverse-coded statements to curb acquiescence and allow a cleaner estimate of construct-specific variance. The halo factor is also the primary caution on RQ5: the positive inter-composite correlations describe in part how one person's general positivity toward PR expresses itself across all three sections, not only how organizationally distinct constructs co-vary. Partial-correlation analyses controlling for overall positivity reduce the inter-composite associations substantially, which confirms that RQ5 correlations should be read as descriptive of perceptual clustering, not as evidence of distinct organizational mechanisms.

5.6 Implications

Practical implications for the sector. For Kazakh B2B logistics firms, KazLogistics member organizations, and the Ministry of Transport ecosystem, the most actionable implication of this

study is about where the constraint on PR actually lies. It does not lie in persuading managers that PR matters: that argument is largely won, as the near-universal and ceilinged endorsement of PR's strategic value demonstrates. The constraint lies in converting that belief into structural authority and decision access — precisely the items with the lowest endorsement in the survey (pre-decision consultation at 45% agreement; formal authority at 48%; informal CEO consultation at 50%). Interventions aimed at raising PR's status in this sector are more likely to be effective if they target the authority and decision-access deficit directly, rather than investing in further advocacy for PR's general value. Professionalization is one avenue that the sector already accepts: the most strongly endorsed belief in the entire instrument was that PR requires professional management knowledge, suggesting an existing consensus that could underpin structured professional-development pathways for communication practitioners.

The finding that firms with a dedicated in-house PR function perceived PR as better positioned — and that firm size and ownership as broad categories do not cleanly differentiate firms on embeddedness — suggests that the most tractable organizational lever is the decision to create and resource a communication function, rather than the type of firm one happens to be. Sector-level initiatives that support small and medium-sized private-local firms (the predominant type among low-embeddedness firms in this sample) in establishing dedicated communication capacity may therefore have more impact than category-level policy distinctions by ownership type.

Theoretical implications. The study makes two modest theoretical contributions. First, it extends the normative–descriptive gap and the upper-echelons loose-coupling framework to an underexplored empirical context: an emerging economy, a B2B sector, and a non-Western institutional environment. The gap is not a peculiarity of Western consumer-facing contexts; it generalizes, at least tentatively, to Kazakh B2B logistics. Second, the empirical near-indistinguishability of perceived structural positioning and perceived strategic integration in this setting suggests that PR's organizational role may need to be conceptualized and measured as a unified embeddedness dimension — rather than as two separable constructs — in institutional contexts where PR's organizational position is still in formation and where formal and behavioral dimensions of PR's role track closely together.

5.7 Limitations Bearing on Interpretation

Six limitations shape how far the findings may be taken, and each defines a scope condition on the claims made above. Small exploratory sample: with n = 42, the study is sensitive only to large effects. The null findings on firm size and ownership (RQ4) are inconclusive, not disconfirmatory: they are fully consistent with small-to-medium true differences that this sample had no power to detect. All findings should be read as descriptive patterns and hypotheses for larger-scale research. Size–ownership confounding: the near-perfect alignment between firm type and firm size in this sample (every private-local firm small; state and international firms predominantly large) means that the RQ4 comparisons cannot be cleanly attributed to either variable; any apparent ownership effect could equally reflect a size effect, and vice versa.

Ceiling and range restriction on Perception: because almost all respondents score near the top of the Perception scale, the range available to the Perception index is restricted. This limits how large correlations involving Perception can be and means that the normative–descriptive gap partly reflects a ceiling artefact rather than a genuine divergence of two independently varying constructs. The gap is real — the negative correlation with overall positivity confirms it — but its quantitative size is partly inflated by the ceiling on belief. Single senior respondent per firm, self-report only:

all three constructs are measured by one manager's self-report, at one point in time. This creates same-source and common-method variance (Podsakoff et al., 2003): a respondent's general attitude toward PR colors responses across all three sections, inflating the apparent co-variation among the indices. The halo factor (r = .74–.93 between each composite and the overall mean) is the most visible symptom. Findings describe how one senior manager perceives PR in their firm, not an audited organizational fact.

Cross-sectional design: the study captures perceptions at a single point in time. All associations reported — including the co-variation among the three composites — are descriptive and cross-sectional. The language of "embeddedness" and "gap" is interpretive; no causal mechanism is established, and there is no evidence on whether belief shifts over time or whether elevated belief eventually pulls embeddedness upward. Purposive, PR-mature sample: the sample was drawn partly through KazLogistics membership directories and professional networks, which are more likely to include larger, more formalized, and PR-aware firms. With 64% of firms reporting a dedicated in-house PR function and a substantial proportion state/quasi-state or international, the sample overrepresents firms that have already formalized communication to some degree. Perceptions are therefore likely upward-biased relative to the broader population of Kazakh logistics firms, which would include many small owner-led forwarders with no communication function at all.

5.8 Directions for Future Research

Each of the limitations above points toward a specific research design need. Together they sketch a research agenda for PR in Kazakh and Central Asian B2B contexts more broadly. A larger, stratified sample is the most immediate need. A study with $n \geq 150$, designed to balance ownership (domestic vs. international) and size (small/medium vs. large) while breaking the confound between the two, would enable genuine group comparisons with adequate power to detect medium effects. Oversampling of small private-local firms — where embeddedness is likely lowest and PR function rarest — would specifically address the upward bias in the present sample.

Revised instrumentation with reverse-keyed items is the second priority. An instrument that includes both positively and negatively worded statements would curb acquiescence bias, produce a cleaner separation of construct-specific variance from general response positivity, and allow a formal test of whether structural positioning and strategic integration separate into two factors or collapse into a single embeddedness dimension. A confirmatory factor analysis with adequate sample size (minimum 5:1 item-to-respondent ratio) would provide the evidence needed to settle this conceptual question. Multi-respondent and objective measurement would strengthen the validity of positioning and integration claims. Triangulating the single senior manager's perceptions with those of the PR function head within the same firm — or with objective organizational records (reporting lines, budget figures, meeting minutes) — would reduce same-source variance and allow a distinction between perceived and actual structural position.

A longitudinal or comparative design would test the upper-echelons prediction that belief eventually pulls embeddedness upward. If managers who strongly endorse PR's value also gradually allocate more authority and decision access to communication functions, the gap should narrow over time. A panel of firms followed across two or three data-collection waves would provide evidence on this coupling that cross-sectional data cannot supply. Finally, deliberate oversampling of low-embeddedness firms — those with no dedicated PR function, small private-local ownership, and managers who rate positioning near the scale midpoint — would redirect research attention toward the firms where the gap is largest and where practical interventions are

most needed. The present sample is too skewed toward PR-mature organizations to describe the full distribution of perceptions in the sector.

6 CONCLUSION

In this exploratory sample of senior managers in Kazakh B2B logistics firms, belief in PR's strategic value was near-universal and ceilinged, while perceived structural positioning and strategic integration were considerably lower, more dispersed, and weakest precisely on the items that mark genuine organizational authority: formal decision power, pre-decision consultation, and direct access to the CEO. The normative–descriptive gap, developed as a field-defining empirical pattern in Western, consumer-facing PR research, is visible here in a new institutional and sectoral setting. What varies across firms in this sample is not whether managers believe in PR, but how embedded PR actually is, and the measured firm characteristics — size and ownership — explain little of that variation. The task for PR in Kazakh B2B logistics is therefore not to win the argument for PR's strategic value, an argument that is already largely won, but to convert that widespread belief into structural authority and a genuine seat at the decision table.

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APPENDIX A: SURVEY INSTRUMENT

All 20 statements below were rated on a 5-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree). All statements are positively worded; none are reverse-coded, so a higher score always indicates stronger endorsement, more developed structural positioning, or greater strategic integration. The questionnaire was administered in Russian and Kazakh; English translations are shown here for reference. Items are grouped by construct below; in the fielded questionnaire they appeared together in three thematic blocks.

A.1 Respondent and Firm Profile

- Current role / position of the respondent.
- Company type (private-local; international/transnational; state/quasi-state; joint venture).
- Company size (small/medium, <250 employees; large, ≥250 employees).
- Years the company has been operating (less than 5; 5–15; more than 15).
- Whether the firm has a dedicated PR/communications employee or department (yes; no; handled by the parent/holding company).
- Gender of the PR/communications lead.

A.2 Block A — Managerial Perceptions of PR (7 items)

- A1. PR is a key management function, not merely a support activity.
- A2. A company's long-term value depends substantially on its reputation.
- A3. The PR director should be one of the CEO's principal strategic advisers.
- A4. In B2B logistics, partner trust is as important as operational efficiency.
- A5. PR is essential for operating in Kazakhstan's complex regulatory environment.
- A6. In our industry, transparency is becoming a precondition for commercial success.
- A7. PR requires professional management knowledge, not merely 'common sense.'

A.3 Block B — Perceived Structural Positioning of PR (5 items)

- B1. The PR specialist in our company has the necessary professional competencies.
- B2. The senior PR/communications specialist reports directly to the Chair of the Board or the CEO.
- B3. PR has a dedicated budget for reputation management and stakeholder engagement.
- B4. The PR head has formal authority to decide the company's public position.
- B5. The Chair of the Board / CEO regularly consults the PR director informally.

A.4 Block C — Perceived Strategic Integration of PR (8 items)

- C1. The PR director takes part consistently in the company's annual strategic planning.
- C2. Management consults PR before making major decisions.
- C3. PR is involved in identifying supply-chain risks before they escalate into crises.
- C4. We use PR to build long-term relationships with international partners.
- C5. The company takes PR's views into account when dealing with government bodies and regulators.
- C6. The PR team is part of cross-functional project groups (e.g., marketing, sales, IT).
- C7. Management uses PR data (e.g., stakeholder analysis) when developing strategy.
- C8. PR goals are directly linked to the company's overall business goals.

A.5 Scoring

Perception Index = mean of the 7 Block A items. Positioning Index = mean of the 5 Block B items. Integration Index = mean of the 8 Block C items. All items are positively worded, so no reverse-coding is applied.

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Americanomics in South Korea

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Assem Izbassar

Abstract

This paper examines the spatial relationship between Americano prices and regional wealth metrics such as Gross Regional Domestic Product (GRDP), and Individual Income. By drawing upon the Big Mac Index, we conceptualize an "Americano Index" and by extension an "Americano Affordability" metric to bet- ter understand regional disparity in purchasing power and cost of living. Moving beyond aggregated statistics, we leveraged a computationally constructed dataset via geospatial scraping of the Naver Maps platform. Our analysis explores South Korea's unique correlation between local economic indicators and Americano pric- ing using Geospatial visualization and the Gini coefficient. The results show that Americano prices are uniform in South Korea and exhibit statistical independence from regional wealth metrics. The South Korean market for Americanos is highly stratified, resulting in negligible regional inequality despite varying regional wealth. Thus, the primary objective of this study is to determine whether it is possible to gauge a country's economic health by examining a specific item and how its affordability and price levels reflect that condition.

INTRODUCTION

The Economist Magazine coined the term "Big Mac Index" in 1986 and it serves as a digestible alternative to understanding Purchasing Power Parity (PPP) between countries (The Economist, 2024). Its appeal lies in the global availability of the Big Mac. This allows it to function as a benchmark for comparing currencies across borders. Since its conception, The Big Mac Index has spawned numerous indices such as the Starbucks Index (Rao, 2023). These indices are grounded by the assumption that a ubiquitous good reveals underlying economic realities.

However, applying this framework to regional analysis in South Korea has its limitations. While McDonalds' franchises are present in major cities, they are sparse in some regions. Our objective of measuring inequality requires a more ubiquitous product.

Therefore, we propose the "Americano Index". In the South Korean context, the Americano is somewhat of a cultural staple (Swiers, 2023). As illustrated in Figure 1, the sheer volume of businesses marked as cafes provides a dataset that exceeds the coverage of McDonald's or standalone large franchises. This is further substantiated by Market research estimates of 102,000 cafes in South Korea (South Korea Coffee Market Growth Analysis - Forecast Trends and Outlook (2025-2034), n.d.).

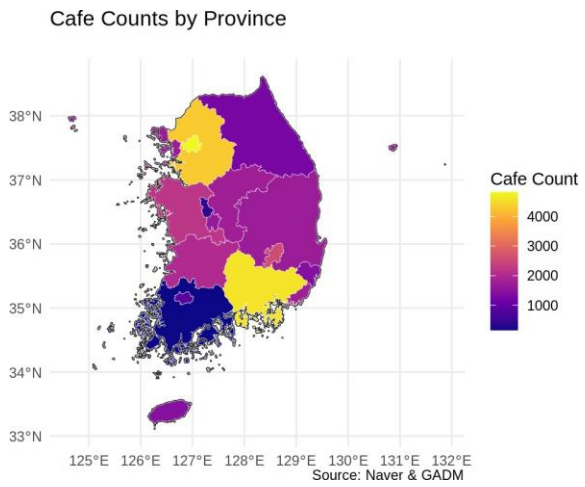


Figure 1: Cafe counts by province

Therefore, this study leverages Americano's ubiquity to reconstruct the Big Mac Index framework. By pairing Americano prices from Naver Maps with GRDP and Individual income data, we aim to uncover the relationship between regional wealth and cost of living thereby introducing a novel perspective to inequality in South Korea.

LITERATURE REVIEW

Big Mac Affordability

The Big Mac Index is primarily a currency tool. However, some scholars have repurposed it to measure inequality. Gharehgozli and Atal (2019) pioneered the use of "Big Mac Affordability" (BMA). They calculated purchasing power across income groups in 29 countries. They demonstrated that real consumption inequality often looks very different from simple income inequality.

Akarsu et al. (2024b) further applied this to the European Union. Their findings highlighted significant gaps between core and peripheral EU nations proving the validity of such an approach. They proved that the affordability of a single standardized good can serve as a robust indicator of economic stratification.

Regional Inequality in South Korea

To properly apply this framework to South Korea, it warrants cross referencing scholarly findings in inequality. Research by the Korea Development Institute (KDI) highlights the complexity of Korean regional disparity. Kim & Han (2024) utilized Gini decomposition to analyze these gaps. They found that inequality between regions is a significant driver of national inequality. This challenges the common narrative that disparity is solely a function of the Seoul Capital Area versus the rest of the nation.

The same study identified a complex relationship between economic growth and inequality. It found that gaps in Gross Regional Domestic Product (GRDP) widened significantly between 2015 and 2020. However, a key distinction exists between production and income. GRDP disparities in Korea are large by OECD standards due to industrial clusters

in cities like Ulsan. However, this does not always translate to differences in household purchasing power. This discrepancy creates a need for alternative metrics that capture the actual cost of living.

Price and wealth

Economic theory suggests that prices should be higher in wealthy regions. Costa et al. (2019) estimates that a 10% difference in regional income typically correlates with a 7% difference in price levels. In the Korean context, Chang & Kim (2017) confirmed the existence of significant price differences across cities. These are usually driven by local demand and rent costs.

Consequently, if the coffee market followed standard economic rules, Americano prices should be higher in wealthier cities. However, the unique market structure of South Korea may disrupt this relationship. The market is characterized by high franchise density and intense competition. This study tests these assumptions. We utilize Americanos to observe the relationship between regional wealth and pricing.

DATA

Methodology

For this study, our analysis is centered around the relationship between regional economic indicators of wealth and the average price of the Americano.

The economic indicators were sourced from the Korean Statistical Information Service (KOSIS) for the year 2022 (KOSIS, 2024). While GRDP per capita is a common measure, this study includes Individual Income per Capita. This is a deliberate choice as GRDP measures economic output within a regional boundary while Individual Income reflects individual purchasing power.

Data Collection

Americano price data was compiled into a custom dataset from cafes in major cities using Naver maps. The following highlights the key steps taken in collecting and cleaning the data.

Step 1. We reversed engineered Naver API calls (Appendix A) using a custom python requests script, naver_cafes.py. The script manipulates the API call to conduct a grid search for cafes across each of the major city in South Korea. This coupled with custom scraping functions allows us to compile place information about cafes.

Step 2. With place information, notably the url, we can scrape menu information using a second script, naver_menu_scraper.py. It loads the menu iframe and extracts the menu into an array. combined_scraped_output.csv encompasses these fields (Appendix A).

Data Summary

1. **GRDP per capita (in millions South Korean Won):** In 2022, Ulsan emerges as the most productive region with a GRDP per capita of 77.51 million KRW. This is attributed to its focus in heavy industries such as ships and automotive, and manufacturing. In stark contrast, Daegu has the lowest GRDP per capita at 26.74 million KRW (Figure 2). This

provides early insights into the economic disparity between the provinces.

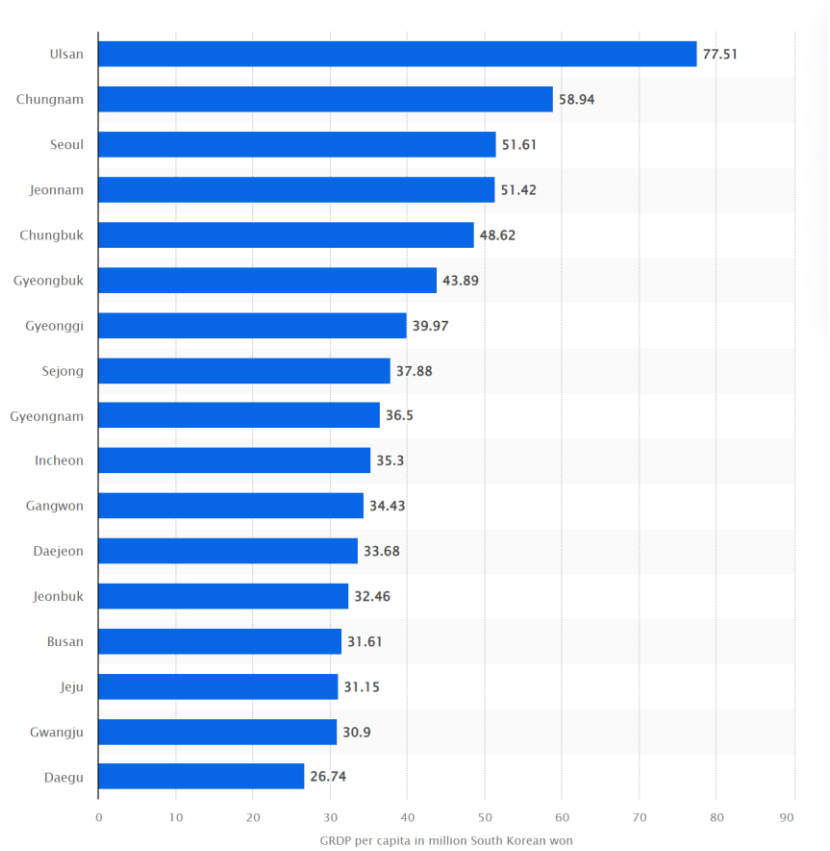


Figure 2: GRDP per capita in million South Korean won, 2022. Source: KOSIS, 2024

2. **Americano Prices:** Initial analysis of the price data indicates that Americano prices are not uniform across the nation. Provinces such as Sejong and Daegu show the high mean prices, an interesting preliminary finding given Daegu's lower GRDP per capita.

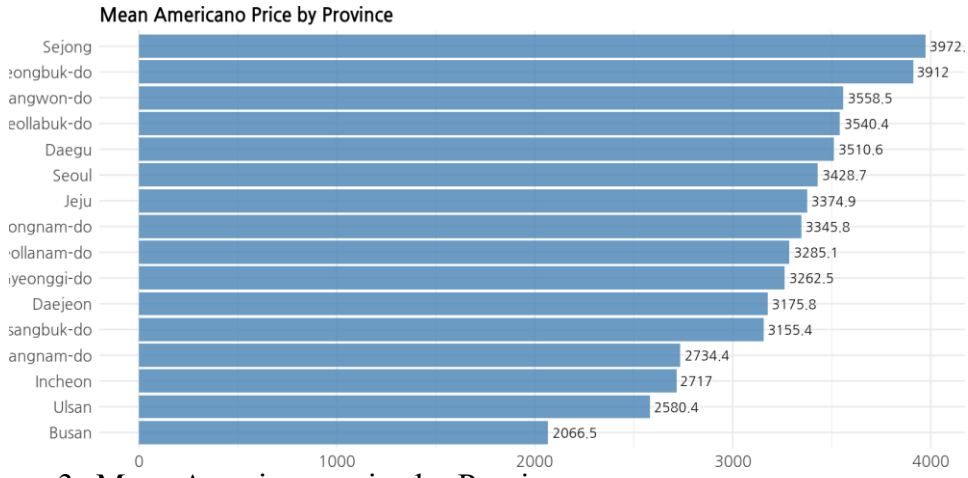


Figure 3: Mean Americano price by Province

A box and whisker plot (Figure 4) offers a more granular look into the Americano

market by observing the distribution within cities. The data shows that prices are not uniform across the country. The Americano market appears to be in 2 distinct price groups. The first group includes cities such as Busan, Incheon, and Gimhae where the median price exists around 2,500 KRW, and the interquartile range (IQR) is relatively small. The second group consists of Seoul, Daegu, and Suwon, etc. This group exhibits an upward shift. Median prices in this group hover between 3,500 KRW and 4,000 KRW. Seoul remains a unique outlier within this group. While its median aligns with other high-cost cities, the distribution (IQR) is much wider. It suggests that the Americano market in Seoul is stratified supporting budget friendly options to the biggest outliers in the data. There exist a thriving luxury coffee market and a low-cost Americano market in Seoul.

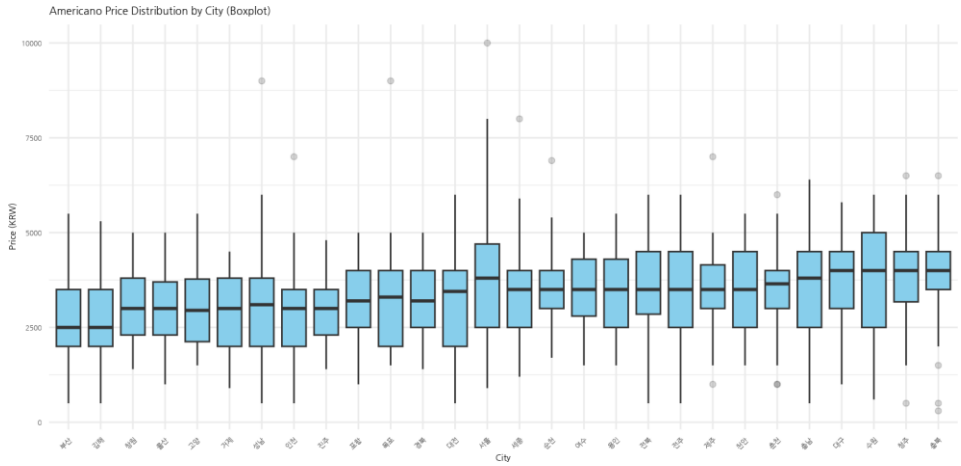


Figure 4: Box and Whisker plot of Americano price by city

Mapping the mean Americano prices reveals a contrast beyond the box and whisker plot. The highest price clusters exist around the Capital region and around Sejong. In contrast, the southeastern coastal region displays significantly lower mean prices. This geographical split implies that there are economic differences at the local economy level that influence the base cost of the Americano. It can be said that the manufacturing heavy south-eastern belt is one of the distinct traits of that region in South Korea and plays a heavy hand in shaping the local economy (K-Developedia, n.d.).

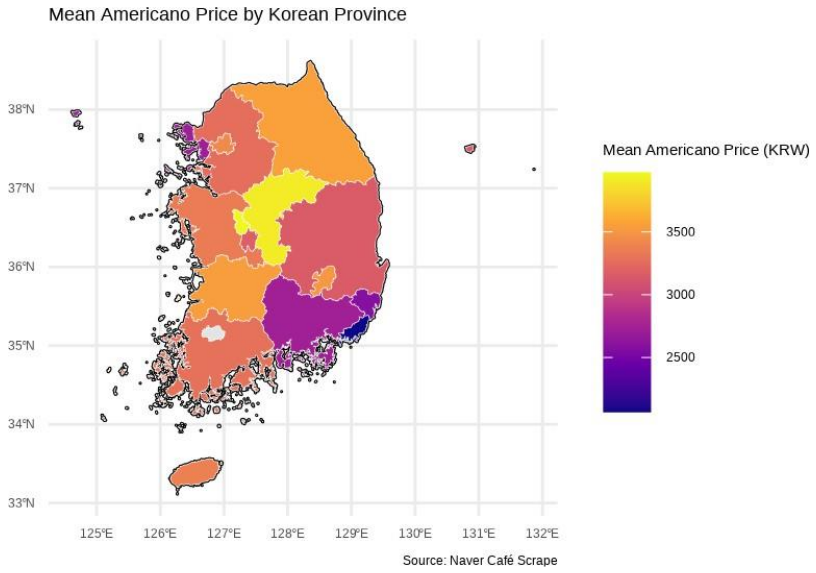


Figure 5: Mean Americano price mapped by Korean Province. Source: Naver Cafe Scrape

3. **Individual income data:** The inclusion of Income per Capita data provides a more nuanced measure of a Korean's wealth. As seen in the data, Seoul records the highest Individual Income per Capita at 29.37 million KRW, followed by Ulsan at 28.10 million KRW (Figure 6). The lowest observed Gyeongsamnam-do is at 22.77 million KRW. Crucially, this highlights the divergence between regional productivity (GRDP) and Korean resident income. Strikingly, Ulsan had the highest GRDP by a large margin, but its Individual Income per capita is lower than Seoul's. De- spite Ulsan's industrial dominance, a large portion of the economic value generated by the region is retained by firms operating in the region rather than the Ulsan resident.

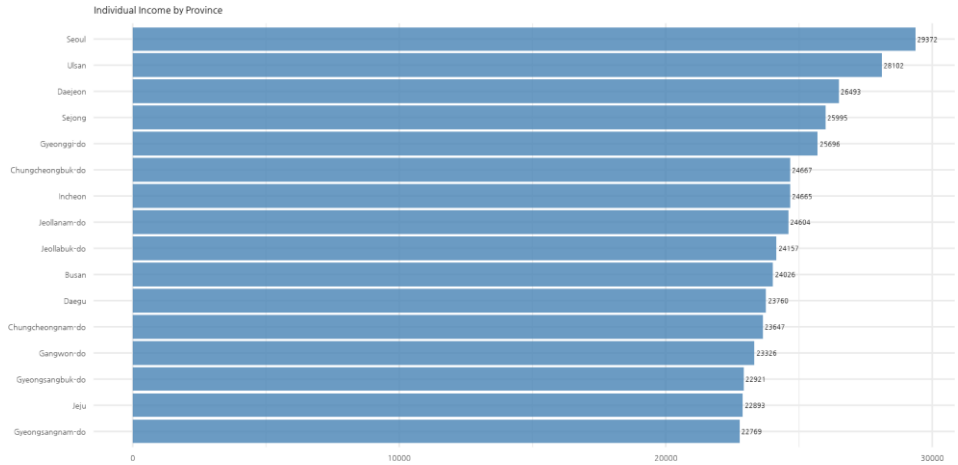


Figure 6: Individual Income by Province (in millions South Korean Won), 2023. Source: KOSIS, 2025

Why this data matters:

It is important to consider that while Gyeonggi and Seoul leads in nominal GRDP (South Korea, n.d.), the per capita calculations penalize Gyeonggi far more heavily and results in the order in Figure 2. Comparing both GRDP and Individual Income will allow greater nuance to observe how it translates to consumer purchasing power.

Findings

Americano Affordability

In this study, we borrowed the Big Mac affordability formula as described by Akarsu in equation 1 (Akarsu et al., 2024b). At its core, it is an income-to-price ratio. While we earlier established regional disparity in terms of income and Americano prices, the Americano affordability formula allows us to build on this to discern the real disparity between the cost of living between the regions. The formula takes the Metric, nominal GRDP per capita or Individual Income, as a fraction of the price of the Americano in said region. The result is further divided by 365 to obtain a daily affordability measure. Affordability represents the number of Americanos an individual in region i could purchase per day. This shifts the perspective from nominal wealth to real purchasing power.

$$Affordability\ i = \frac{Metric}{Mean\ Price\ \times 365} \qquad (1)$$

Interestingly, the GRDP based affordability (Figure 7) differs greatly from the Individual Income based affordability (Figure 8). While Income based Americano Affordability is generally weaker, Ulsan exhibits a substantial disparity. In GRDP terms, Ulsan is an outlier. An Ulsan resident can afford 82 cups per day. However, when adjusted for Individual Income, this figure collapses to 29 cups. This indicates that while Ulsan generates high economic value per capita, wealth doesn't translate to individual purchasing power. Conversely, Busan demonstrates the highest affordability. Despite a lower ranking in nominal metrics such as 14th in GRDP (Figure 2) and 10th in Individual income (Figure 4), Busan ranks 1st in Income based affordability, 31.8 cups/day (Figure 8). Busan is advantageous where the lower price of coffee, a mean of 2,066 KRW, reflects a lower cost of living.

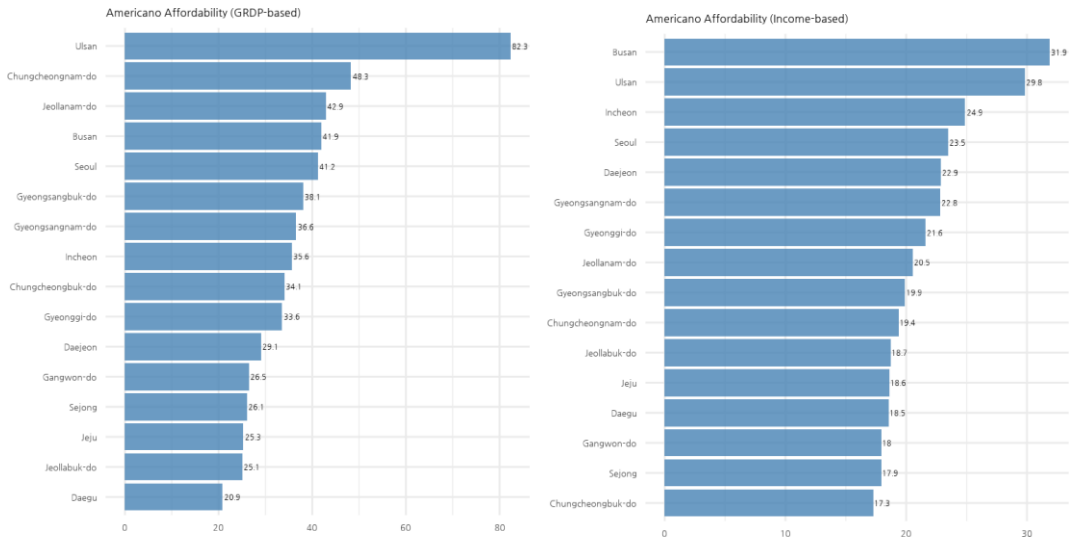


Figure 7: Affordability by GRDP (Left) and Individual Income (Right)

Geographically, a trend does seem to emerge in the Southeastern region around Busan. While one could theorize that Busan's standing as a port (The Official Website of Busan Metropolitan City., n.d.) reduces costs from imports, it doesn't fully explain the disparity given that the same pattern doesn't occur around Incheon. It's plausible that this affordability divide is due to the economic difference between the Southeastern Industrial Belt and the other regions.

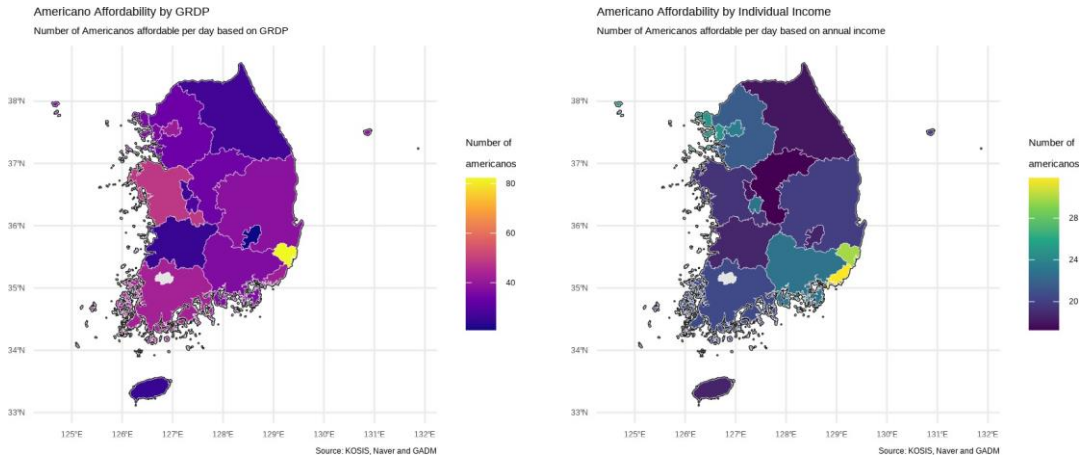


Figure 8: Affordability mapped by GRDP (Left) and Individual Income (Right)

Gini Coefficient

Working with Americano for affordability allows us to explore income inequality between the regions. We leveraged Gini Coefficient as a tool for this. As described in equation 2, we sum the absolute affordability difference between every pair of regions and normalize the mean using R (Appendix B).

$$Gini = \frac{1}{2m^2\tilde{n}} \sum_{a=1}^{m} \sum_{b=1}^{m} |n_a - n_b| \qquad (2)$$

where m is the number of observations, n is the affordability value, and $\tilde{n}$ is the affordability mean.

The results show that the GRDP-based Gini is 0.1827 and Income based Gini is 0.0996. This suggests that the Gini is close to perfect equality. This implies that the market forces regulating Americano prices seem to be correct for regional wealth disparities. Incomes may vary, but the price of Americano does not scale with local wealth. In terms of Americano consumption, the inequality gap is negligible.

Statistical Independence of Price and Wealth

To test the relationship between regional economic strength and Americano pricing, we

carried out a Pearson correlation analysis. Contrary to standard economic theories where higher income drives higher prices, the result reveals that the Americano prices are decoupled from regional wealth metrics. The correlation coefficients are negligible across all metrics (Table 1). In addition, high p-values ($p>0.05$) indicate that the results are not statistically significant (Table 2). We cannot reject the null hypothesis whereby a region's wealth is unrelated to the price of Americano.

Table 1: Correlation Matrix (Americano price against Wealth metrics)

	mean_price	median_price	grdp	individual_income
mean_price	1.000	0.900	-0.104	0.016
median_price	0.900	1.000	-0.153	-0.110
grdp	-0.104	-0.153	1.000	0.509
individual_income	0.016	-0.110	0.509	1.000

Table 2: Statistical Test (P-value)

	mean_price	median_price	grdp	individual_income
mean_price	–	–	0.7023	0.9544
median_price	–	–	0.5706	0.6848
grdp	0.7023	0.5706	–	0.0441
individual_income	0.9544	0.6848	0.0441	–

The statistical independence of Americano prices suggests that the price of an Americano has become a sort of constant in South Korea. It is a unique commodity that is resistant to inflationary pressures often associated with wealthy cities. Lastly, we observed a moderate correlation between GRDP and Individual income, $r = 0.5088$. Al- though positive, the correlation is not close to 1. It is a statistical confirmation that the regional economic output doesn't perfectly translate to one's individual income. Hence, accounting for the Ulsan anomaly.

LIMITATIONS

Data Coverage and Granularity

While our grid-based sampling strategy was highly effective for dense metropolitan areas, it faced challenges in sparsely populated regions where cafes are distributed irregularly. To maintain statistical rigor, we enforced a strict inclusion criterion requiring a city to have a minimum of 30 verified Americano prices. Consequently, specific lower-density regions, such

as Gwangju, did not meet this threshold and were excluded from the final granular analysis. This results in the specific "grey areas" visible in our choropleth maps and limits the study's ability to fully capture the coffee economy of these specific municipalities.

Furthermore, to maximize data density, we aggregated city-level data to the provincial level. This method assumes that major cities are representative of their respective provinces. For example, in Gyeonggi-do, data was pooled from four major cities (Suwon, Seongnam, Yongin, and Goyang). While these cities represent the bulk of the province's economic activity, this aggregation strategy may overlook price variance in the smaller, semi-rural counties.

Unweighted Gini Coefficient

When calculating the Gini coefficient for Americano affordability, our methodology treats each region equally. We utilized a standardized Gini calculation based on the mean price per city, rather than weighting these values against population size.

$$G_t = \frac{\sum_{a=1}^{m} \sum_{b=1}^{m} w_a w_b |n_a - n_b|}{2 \sum_{a=1}^{m} w_a n_a \sum_{a=1}^{m} w_a} \quad (3)$$

Consequently, our Gini coefficients represent inter-region inequality rather than inter-person inequality. While valid for assessing the disparity between administrative economies, this approach potentially understates the experience of the average citizen if high inequality exists within populous provinces.

Validation

To ensure that these constraints did not compromise the validity of the study, a rigorous validation protocol was implemented. Prior to the main data collection, a pilot study was conducted targeting the area surrounding Pusan National University (PNU). We physically verified the menu prices of 50 randomly selected cafes and compared them against the values returned by our scraper, confirming the accuracy of our parsing logic. Additionally, we monitored the data for statistical outliers; prices falling outside a logical range (below 900 KRW or above 20,000 KRW) were manually reviewed and removed to ensure the final dataset accurately reflected the market price of a standard Americano.

CONCLUSION

This study used the Americano Affordability Index to explore regional inequality in South Korea. However, results pointed to a compelling narrative. Americano prices are statistically independent of regional wealth. With correlation coefficients near zero, we can conclude that living in a wealthier city does not necessitate higher Americano prices. Against the backdrop of economic wealth, Americano prices do not move.

Extremely low Gini coefficient for Income based affordability suggests that Americano is an equalizer in consumption. The market is stratified to the extent that Americano is accessible at every price point. Beyond economic findings, this study demonstrates the viability of using scraping-based methodologies to overcome data scarcity. While the paper establishes independence of Americano price from wealth, it raises new questions regarding franchise dominance and market saturation that drives this price uniformity.

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Combined_scraped_output.csv fields

Field Name	Description
place_id	Unique identifier for the place
rank	Ranking or position based on popularity/rating
name	Name of the place
x / y	Longitude / Latitude of the place
distance	Distance from reference point
categoryName	Name of the category (e.g. Cafe)
reviewCount	Number of reviews
averagePrice	Average price range associated with the place
address	Full address of the place
americano	Information about the Americano menu item
menu_items	List of menu items offered by the place

Gini coefficient in R

```
calculate_gini <- function(affordability_values) {affordability_
 values <- affordability_values[!is.na(affordability
    _values)]
 n <- length(affordability_values) total_
 sum <- 0
 for (i in 1:n) {
  for (j in 1:n) {
   total_sum <- total_sum + abs(affordability_values[i] -affordability_
      values[j])
  }
 }
 mean_n <- mean(affordability_values) gini
 <- total_sum / (2 * n^2 * mean_n) return(
 gini)
}
```

City-Level Statistics

City	Count	n	Mean Price	Median	Min	Max
Geoje	38.00	36.00	2,811	3,000	100	4,500
Gyeongbuk	69.00	68.00	3,157	3,200	100	5,000
Goyang	40.00	39.00	2,892	2,900	100	5,500
Gimhae	89.00	86.00	2,752	2,500	100	24,900
Daegu	260.00	254.00	3,510	4,000	100	15,000
Daejeon	242.00	236.00	3,175	3,200	100	16,000
Mokpo	30.00	30.00	3,090	3,150	100	9,000
Busan	160.00	158.00	2,066	2,400	100	5,500
Seoul	672.00	656.00	3,428	3,500	100	41,000
Seongnam	108.00	106.00	2,904	3,000	100	9,000
Sejong	66.00	65.00	3,972	3,500	100	44,000
Suwon	127.00	122.00	3,661	4,000	100	6,000
Suncheon	59.00	58.00	3,341	3,500	100	6,900
Yeosu	46.00	46.00	3,341	3,500	100	5,000
Yongin	30.00	29.00	3,389	3,500	1,500	5,500
Ulsan	143.00	138.00	2,580	2,600	100	5,000
Incheon	203.00	200.00	2,717	3,000	100	7,000
Jeonbuk	144.00	141.00	3,558	3,500	100	12,000
Jeonju	170.00	166.00	3,525	3,500	100	12,000
Jeju	252.00	251.00	3,374	3,500	100	7,000
Jinju	43.00	42.00	2,878	3,000	100	4,800
Changwon	115.00	112.00	2,641	2,500	100	5,000
Cheonan	102.00	101.00	3,277	3,500	100	5,500
Cheongju	128.00	123.00	3,930	4,000	100	15,000
Chuncheon	95.00	94.00	3,558	3,650	1,000	6,000
Chungnam	81.00	78.00	3,434	3,800	100	6,400
Chungbuk	125.00	119.00	3,892	4,000	100	11,000
Pohang	74.00	71.00	3,153	3,000	100	16,000

Provincial Affordability Statistics

Province	Mean Price	GRDP	Income	Affordability (GRDP)	Affordability (Income)
Busan	2,066	31.61	24,026	41.91	31.85
Chungbuk	3,911	48.62	24,667	34.05	17.28
Chungnam	3,345	58.94	23,647	48.26	19.36
Daegu	3,510	26.74	23,760	20.87	18.54
Daejeon	3,175	33.68	26,493	29.05	22.85
Gangwon	3,558	34.43	23,326	26.51	17.96
Gyeonggi	3,262	39.97	25,696	33.57	21.58
Gyeongbuk	3,155	43.89	22,921	38.11	19.90
Gyeongnam	2,734	36.50	22,769	36.57	22.81
Incheon	2,717	35.30	24,665	35.60	24.87
Jeju	3,374	31.15	22,893	25.29	18.58
Jeonbuk	3,540	32.46	24,157	25.12	18.69
Jeonnam	3,285	51.42	24,604	42.88	20.52
Sejong	3,972	37.88	25,995	26.13	17.93
Seoul	3,428	51.61	29,372	41.24	23.47
Ulsan	2,580	77.51	28,102	82.29	29.84

Digital Leadership as Governance-in-Use: Cross-Sector Transfer and Adaptation in Kazakhstan's Public-Sector Digital Transformation

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ABSTRACT

This article explores how private-sector digital leadership and governance practices are transitioning to public-sector organizations in Kazakhstan within the context of digital transformation and how these practices are being adapted to fit the institutional context. The study uses a qualitative, interpretivist design based on 11 semi-structured interviews with respondents from various positions within the Kazakh digital transformation environment, from public, quasi-government and private organizations. Interview responses were analyzed using thematic analysis, with attention to transfer conditions, adaptation mechanisms, collaborations, and barriers. The findings showed that digital leadership is manifested not through the description of individual traits, but through operational governance and digital practices, such as coordination routines, platform integration, data arrangements, verification mechanisms, reporting requirements, and vendor management. Practices transferred to the public sector do not remain unchanged, but rather are translated and reformulated to meet legality, accountability, procedural, and public value requirements. The study also showed that while collaboration between sectors is necessary, it is fraught with challenges. Non-transfer routines are also analytically significant because they provide insights into practical institutional and political frameworks. The article contributes to the leadership literature by conceptualizing digital leadership as governance-in-use, and highlighting the fact that cross-sectoral transfer in public digital transformation is better understood as a process of selection, adaptation, and occasional friction, rather than direct adoption.

KEYWORDS: digital leadership; digital transformation; public sector; cross-sector transfer; governance practices; Kazakhstan

1 INTRODUCTION

Digital transformation has become a central development area in public administration (Mergel et al., 2019; UN DESA, 2024). As governments operate in increasingly complex digital environments, it is no longer enough for governments to simply digitize existing services; rather, they need to convert existing services and procedures into digital forms and platforms. Digital transformations encompass a more comprehensive approach, addressing coordination, decision-making, data management, and systematic approaches in government operations (Mergel et al., 2019; OECD, 2020; Vial, 2019). This challenge is especially significant in the public sector, where, in addition to implementing digital initiatives, the state must operate under constant demands for accountability, public trust, and institutional constraints (Bozeman, 1987; Janssen et al., 2018; Moore, 1995). Accordingly, the success of modern public sector digital initiatives depends not only on the proficient use of technological tools, but also on governance and leadership practices that

act as an enabling mechanism for digital transformation (Adie et al., 2024; OECD, 2020; Vial, 2019).

In this article, digital leadership in the public sector context is considered not only as individual managerial traits, but as a combination of managerial and organizational practices through which digital transformation occurs (Adie et al., 2024; Orlikowski, 2002; Raelin, 2017). This includes practices such as cross-unit coordination, governance of digital initiatives, platform and data arrangements, management of contractors and vendors, and mechanisms of accountability in implementation (Khatri & Brown, 2010; OECD, 2021; Weill & Ross, 2004). Accordingly, from a practice perspective, considering digital leadership as a set of organizational practices, allows for analysis of practices by looking through specific management actions, government mechanisms, procedures, management processes, and decision-making in the context of digital transformation (Adie et al., 2024; Orlikowski, 2002; Weill & Ross, 2004).

According to NPM (New Public Management), governments aim to apply practices from the private sector, especially in the areas of innovation, data usability, and digital delivery. This trend can be observed particularly in relation to digital transformations, where it is generally believed that private firms are much faster in decision-making, are able to experiment more freely, and develop capacity faster than public organizations (Boyne, 2002; Ospina, 2017; Tabrizi et al., 2019). However, the practices themselves rarely transition from private to public ownership unchanged (Czarniawska & Joerges, 1996; Kostova, 1999; Røvik, 2016). State-owned organizations face many constraints; they must operate within institutional logics formed by legality, public accountability, procedural obligations, and public value bonds, which distinguishes them from market-oriented firms (Bozeman, 1987; Moore, 1995; Scott, 2014). As a result, the question is not whether practices are transferred from the private sector to the public sector, but how they are transferred and adapted to the public context (Czarniawska & Joerges, 1996; Szulanski, 1996; Zahra & George, 2002).

Kazakhstan presents a unique case for studying public sector digitalization (Government of the Republic of Kazakhstan, 2017; OECD, 2023; UN DESA, 2024). Digitalization is being actively promoted at the state level through the ongoing modernization of strategies, practices, and the state program Digital Kazakhstan (Government of the Republic of Kazakhstan, 2017; Prime Minister of Kazakhstan, 2018). This is also reflected in the broader policy vector of developing more responsiveness, improving service, and modernizing the capabilities of government agencies (OECD, 2020; Tokayev, 2019). At the same time, Kazakhstan's digital transformation is underway and depends on more than just government institutions (OECD, 2020; OECD, 2023). Quasi-governmental organizations, private contractors, vendors, and other external actors play a significant role in implementing initiatives, designing services, developing infrastructure, providing vision technology, and, most importantly, providing the capacity for digitalization that the state alone cannot achieve. This creates a unique mixed institutional environment in which both public and private actors are closely intertwined in the practical work of digital transformation (Emerson et al., 2012; Mergel et al., 2019; OECD, 2020). In such settings, the cross-sectoral transfer of practices becomes a daily routine and a means through which digital change is achieved. For this reason, Kazakhstan provides a unique and useful case study for analyzing how private sector leadership and practices fit into the context of the public sector and the changes occurring within them (OECD, 2020; OECD, 2023; UN DESA, 2024).

Despite the increasing literature on digital governance, a clear research gap remains (Adie et al., 2024; Mergel et al., 2019; Weill & Ross, 2004). The topic of digital leadership itself remains vague in the literature, as there is no unified understanding of what digital leadership means among scholars (Adie et al., 2024; Bauwens & Cortellazzo, 2025; Cortellazzo et al., 2019). Additionally,

far less attention has been paid to how specific leadership and governance practices have transitioned and adapted in the public-sector context (Adie et al., 2024; Czarniawska & Joerges, 1996; Røvik, 2016). Consequently, this study examines the conditions under which private-sector digital leadership and governance practices are transferred to public-sector organizations in Kazakhstan. The study further examines the forms in which transferred digital leadership and governance practices take place in public organizations. Finally, it explores the forms of collaborative practices which enable or sustain the transfer and adaptation of these practices across the public-private boundary.

2 THEORETICAL BACKGROUND

2.1 Digital leadership in public and private contexts

The literature on digital transformations in public administration increasingly covers topics such as digital government reforms, integration of services and platforms, public value and state capacity through digitalization, while business literature primarily studies changes in business models, the renewal of organizational structures, and data-driven competition (Mergel et al., 2019; OECD, 2020; Verhoef et al., 2021; Vial, 2019). Digital leadership scholarship focuses on leadership and executive competencies and capabilities, as well as the role of leaders in driving organizational change in the context of constant technological change (Adie et al., 2024; Cortellazzo et al., 2019; Tagscherer & Carbon, 2023). Although these concepts often overlap in their manifestations, they should be considered distinct phenomena. What is much less clear is how specific practices in digital governance and leadership "migrate" across sectors, particularly between private organizations and public institutions, and how these practices change under the influence of different conditions and institutional rules (Adie et al., 2024; Mergel et al., 2019; Vial, 2019).

While previous leadership theories have roots in leader-centric interpretations, the context of today's organization and technological developments does not allow narrow interpretations to exist. A more practical approach would be to conceptualize digital leadership as an enabling set of organizational and governance practices through which digital transformation is coordinated, legitimized, and occurs, allowing for a detailed examination of how practices are transferred, enacted, and adapted across sectors (Adie et al., 2024; Orlikowski, 2002; Raelin, 2017). Framing digital leadership in such a narrative allows it to be empirically observable, as it becomes possible to study it through concrete organizational mechanisms and repeated practices, rather than just abstract personal qualities (Orlikowski, 2002; Vial, 2019).

From a practical perspective, digital leadership can be explored through the recurrence of organizational activities found in both the private and public sectors, even if they are justified or implemented differently. Such practices include coordination between units or departments, data-driven decision making, service streamlining, platform implementation, interoperable logic, experimental routines, service design, and risk and safety arrangements (Adie et al., 2024; Gawer, 2014; Khatri & Brown, 2010; Weill & Ross, 2004). Analytically, the mere presence of these practices is not important, since it is assumed that their emergence will be identical across sectors; rather, the forms and manifestations of these practices are of particular importance, since they are the basis for studying how similar governance and leadership logics are transferred to the contexts of other sectors and how they are reconstructed in different institutional conditions (Mergel, 2016; Mergel et al., 2019; Vial, 2019). This makes digital leadership a practical and comparative

phenomenon, rather than simply a descriptive label for management actions in the digital environment.

2.2 Cross-sector transfer of practices

Digital leadership and governance practices do not remain isolated within their sectors. In the context of modern digital transformation, organizational capabilities are increasingly being developed in unified ecosystems that bring together government agencies, private suppliers, consultants, quasi-government companies, and other external partners (Dunleavy & Margetts, 2013; Emerson et al., 2012; Mergel et al., 2019). Consequently, daily routines, accumulated knowledge, management approaches and governance mechanisms can flow from one sector to another rather than existing and developing in isolation in one institution (Argote & Ingram, 2000). This makes cross-sector transfer a convenient and useful analytical lens for understanding public-sector digital transformation, especially in contexts where the state depends on private expertise, capacity for digitalization, outsourcing, and intra-organizational collaboration to implement digital initiatives (Ansell & Gash, 2008; OECD, 2021).

From a theoretical perspective, digital leadership aligns with contingent and situational leadership. Contingent theory suggests that leadership effectiveness depends on the fit between the approach and the organizational context, rather than on any single, universally superior style (Fiedler, 1967). Similarly, situational leadership emphasizes the need for leaders to adjust directive and supportive style based on followers' readiness and needs in a given situation (Hersey & Blanchard, 1969). Along the same lines, digital research on digital leadership demonstrates that competencies required for digital transformation differ depending on driving forces, strategic objectives, and the organizational environment. Earlier studies on e-leadership also indicated that technology-mediated leadership is shaped through interaction with organizational structures rather than existing independently of them (Avolio et al., 2000; Müller et al., 2024). Consequently, practices adapted from one sector are likely to require contextual adjustments, as approaches effective in private organizations may need alteration to fit public accountability, bureaucratic procedures, and institutional limitations.

However, transfer should not be understood as the direct copying of practices and routines. Research on knowledge transfer and policy adoption shows that practices very rarely transfer unchanged from one environment to another. On the contrary, they are often subject to modification, reinterpretation and reconstruction as they move into another sector (Czarniawska & Joerges, 1996; Røvik, 2016). The literature on internal transfer also shows that transfer is typically difficult even within firms due to routine habits, vertical barriers, and limited ability to absorb knowledge, suggesting that movement across private and public boundaries should be even more conditional (Szulanski, 1996; Zahra & George, 2002). Thus, transfer is a complex process of translation and adaptation, and not just adoption. The practices that are transferred from the private sector to the state, and how these practices undergo change to become legitimate in the state context, as well as what forms these practices take are significant areas of study that need scholarly attention (Bozeman, 1987; Moore, 1995).

2.3 Public-sector constraints and adaptation

The need for adaptation is particularly strong in the public sector, as government organizations operate under institutional conditions that differ significantly from private firms, beginning with their fundamental purpose. The work of government agencies is defined by legal requirements, public reporting, political oversight, and formal procedures, all of which influence what digital practices can occur and how quickly they can change (Bozeman, 1987; Moore, 1995;

Rainey, 2014). In digital transformation, these constraints have particular consequences, as they affect decision rights, opportunities for experimentation, data sharing, and the legitimacy of technological tools (Janssen et al., 2018; OECD, 2020; UN DESA, 2024). Government organizations also often face a lack of institutional capacity, dependence on external suppliers, and the difficulty of restructuring established legacy systems, which complicates the comprehensive institutionalization into everyday routines (Heeks, 2002; Mergel et al., 2019; OECD, 2021). The limitations given do not make the transfer of practices impossible; rather, they make them extremely selective, conditional, and shaped by the context.

Kazakhstan is a particularly relevant field for studying the dynamics of practices. Digital transformation is actively promoted as a state-led modernization agenda and is being implemented through a strong, comprehensive state program. At the same time, the implementation of these solutions often relies on quasi-state elements, private entities, and private contractors and vendors (Government of the Republic of Kazakhstan, 2017; OECD, 2023; Prime Minister of Kazakhstan, 2018). In such a context, cross-sectoral relationships become the cornerstone of achieving digital change. Private sector practices can become important reference points or even drivers of change, making it even more crucial to understand how they are translated into institutional realities such as accountability, compliance, and public value considerations (Ospina, 2017; OECD, 2021). Therefore, analytically, Kazakhstan is becoming a valuable case with state-led but differentiated digital environments, where the state pursues ambitious goals of comprehensive digital modernization, while organizational capacities are achieved divergently through state, quasi-state, and private structures.

2.4 Analytical framing

On this basis, the article adopts an analytical framework based on the following four elements. First, it studies digital leadership and governance practices in the private sector that may be included in public sector digital initiatives. Secondly, it determines under what conditions the transfer occurs, so that practices become acceptable, achievable and/or legitimate in the public context (Argote & Ingram, 2000; Bozeman, 1987; Zahra & George, 2002). Third, it analyzes the adaptation mechanisms through which practices take on modified forms in the public setting (Czarniawska & Joerges, 1996; Røvik, 2016). Fourth, it considers outcomes from transfers, which may include enactment, adaptation, blockage, or symbolic adoption.

3 METHODOLOGY

3.1 Research design

The article is based on an exploratory qualitative design, from an interpretivist and constructivist perspective. This design is appropriate because the study focuses on how digital leadership and governance practices are understood, implemented, transferred, and adapted in organizational settings, rather than measuring variables or testing hypotheses in a statistical sense (Creswell & Poth, 2018; Maxwell, 2013; Merriam & Tisdell, 2016). According to this perspective, digital leadership is considered as a socio-technical construct in the form of organized institutional accepted practices, including routines of coordination, decision-making, accountability, and data governance, the appearance of which is justified by the context (Schwandt, 2014; Yanow, 2000). This approach is particularly suitable for this article, as the analytical focus is on the meanings, organizational processes, and institutional arrangements through which cross-sectoral transfer becomes possible, modifiable, or limited.

Kazakhstan provides an analytically relevant empirical setting for studying this inquiry. National initiatives like Digital Kazakhstan are promoted through public organizations, quasi-state actors, and private-sector providers, creating cross-sectoral interactions on a permanent basis rather than as rare events. International and OECD assessments also point to uneven distribution of organizational capacities, coordination problems, and dependence on external suppliers in achieving digital reforms (Government of the Republic of Kazakhstan, 2017; OECD, 2020; OECD, 2023; UN DESA, 2024). Therefore, Kazakhstan is a suitable and appropriate case study for this research design because it allows for the study of digital governance and leadership in a context where implementation is justified not only by formal government procedures but also by inter-organizational dependencies, direct coordination between the public and private sectors, and their constraints.

3.2 Data Collection

The article is based on 11 semi-structured interviews with participants occupying various positions in the digital environment of Kazakhstan. They were used as the primary data generation method because they allow participants to describe practices, constraints and interpretations in detail, while still remaining focused on the central themes of the study (Creswell & Poth, 2018; Kvale & Brinkmann, 2015). The interviews conducted represent a set of diverse institutional overviews relevant to the research question, including an assessment of private sector digital practices and solutions, the experiences of public and quasi-governmental organizations, and state-related digital integrations. Participants were selected through purposive, criterion-based sampling, also guided by their direct involvement in digital initiatives and the relevance of their experience to issues of cross-sectoral transfer, governance practices, and institutional adaptation (Patton, 2015; Robinson, 2014). The goal of the sample was not a statistical representativeness, but the creation of analytically rich material from various perspectives in the public-private digital transformation field.

3.3 Data analysis

The material was analyzed using thematic analysis, with process-oriented reading to examine how participants describe transfer, limitations and adaptations in practice (Braun & Clarke, 2006; Maxwell, 2013). The coding focused on themes directly related to the conceptual framework of the article, including transferred practices, adaptation mechanisms, barriers and limitations to transfer, and forms of collaboration across sectors. Particular attention was given to specific governance routines, such as collaboration agreements, data-related practices, supplier participation, implementation filters, and accountability limitations. The coding process remained iterative and provisional, combining both initial descriptive coding and more focused thematic clusters as patterns began to emerge between interviews (Miles, Huberman, & Saldaña, 2014; Saldaña, 2021). The aim at this stage was to identify analytically significant patterns linking the interviewees' narratives to the broader research question.

4 FINDINGS

Based on interview material, this section examines how digital leadership, cross-sector transfer, and institutional adaptation are described in practice. Based on a practical perspective, the findings highlight the interrelationships between operational routines, capacity gaps, adoption filters, and public sector constraints in shaping how digital practices are adapted and accepted.

4.1 Digital leadership through operational practices

The first and most consistent pattern is that respondents do not speak of digital leadership in abstract terms like vision, inspiration, or a personal management style. Rather, they describe digital leadership through practical elements that organize work in real-world settings. Across interviews, leadership was mentioned through references to platforms, system integrations, analytical tools, verification procedures, cybersecurity and reporting requirements, and the routines through which digital initiatives are implemented and coordinated. For example, Interview 1 described digital work through a dense operational architecture: “integration” with the First Credit Bureau and the State Credit Bureau, Smart Bridge connections, subscriber verification, consent signed through “OTP” or “ECP,” and “anti-fraud” controls (Interview 1). In this sense, leadership is perceived not as something that a leader "has," but rather as management practices that coordinate individuals, technologies, and decision-making processes, which together constitutes the very purpose of leadership. The empirically obtained material thus supports a practically oriented reading of digital leadership, where socio-technological and organizational shifts and everyday practices matter more than the rhetoric of leadership statements.

The same pattern becomes clearer when examining practices dynamics between sectors. These movements typically involve not a comprehensive leadership model or strategic philosophy, but rather clear operational practices, such as platform logics, system integration routines, analytics-based monitoring, authentication and compliance mechanisms, externally sourced digital solutions, and coordination agreements between private vendors and technical intermediaries. Even when respondents directly mention leadership, they do so by describing how the workflow is structured and how digital implementations were made. Interview 2, for instance, framed digital work mainly through administrative coordination, explaining that her role includes “reporting requests from the ministry” and submitting licensing materials through state digital platforms (Interview 2). In a similar way, Interview 1 referred not to leadership style, but to practical management projects such as heat maps, dashboards, and monitoring how often citizens call “102” or “103” in projects with public actors (Interview 1). This suggests that knowledge transfer occurs primarily at the level of management mechanisms and implementation tools. Analytically, the data shows that digital leadership is operationalized through specific practices that can be observed, adjusted, and, if necessary, transferred, rather than through normative leadership frameworks.

4.2 Capacity gaps create demand for private-sector

The second recurring theme is that private sector expertise is entering the realm of public and quasi-public initiatives, not only because it is seen as innovative or effective, but also because it is necessary in conditions of limited internal state capacity. One government official emphasized in the interview that most technology solutions and software providers originate from the business sector, primarily because government organizations lack the specialized competencies to independently develop, build, and maintain complex digital systems. In the researcher notes from Interview 4, this dependence was described especially directly: around 90 percent of software and program suppliers in the relevant quasi-governmental setting came from the business sector, while the state lacked sufficient competence for independent development (Interview notes, Interview 4). Along similar lines, in an interview with a private vendor operating in the telecom industry, the interviewee shared that the company closely collaborates with the government on anti-fraud projects, as the state is unable to independently build a comprehensive identification system, implement the latest technologies, and utilize up-to-date experience in this area. Interview 7 supports this point quite clearly. When asked whether state bodies turn to the company because they lack such capacity internally, the respondent answered: “Not only [because they lack it]. First

of all, we have models, targets and experience," and then described analytical and decision-support tools used in projects with akimats and other public actors (Interview 7). Similar patterns also emerge indirectly in other interviews, where digital infrastructure, compliance tools, and web platforms are described as existing systems that organizations use and rely on, rather than systems developed entirely in-house. Transfer thus appears demand-driven, necessitated not only by the recognition of private sector methods but also by the practical dependence of solutions on external technical capabilities, knowledge, and operational know-how.

4.3 Transfer is filtered by relevance, feasibility, and economic rationality

The collected data suggests that transfer does not occur automatically but involves a selective process. Participants do not portray public sector adoption as merely identifying and replicating best practices from the private sector. Instead, proposed practices and solutions are subjected to multiple evaluative stages prior to consideration for implementation. Three criteria were consistently evident across the materials: relevance and practical utility, feasibility with respect to resources and implementation capacity, and economic rationality. Research notes from Interview 4 explicitly identify these as the principal standards for project appraisal: relevance and usefulness, realism relative to available resources, and economic expediency (Interview notes, Interview 4). These criteria are not solely formal categories; they recur as substantive considerations in participants' descriptions of how digital initiatives are appraised, filtered, or rejected. This insight underscores that transfer hinges less on abstract appeal and more on whether a given practice withstands practical scrutiny within governmental contexts.

The first criterion is relevance and usefulness: a digital practice or solution must primarily be perceived as addressing a concretely defined operational or governance challenge. Respondents do not imply that a practice is transferable merely by virtue of its existence in the private sector or demonstrated success elsewhere. Rather, the initial inquiry concerns whether the practice serves a particular institutional objective, responds to a recognized administrative problem, or contributes to an articulated public policy goal. Hence, the perceived functional utility of an initiative acts as a gatekeeping condition for transfer. Practices lacking a discernible governmental purpose are unlikely to proceed, regardless of technological sophistication. Interview 11 reinforces this interpretation by framing public-facing projects around specific functions, such as emergency alerts, public notifications, and legally mandated communication, rather than innovation pursued for its own sake (Interview 11). This emphasis reflects the imperative in public administration that digital initiatives align with policy priorities, satisfy administrative needs, and secure public legitimacy, rather than being adopted solely on the basis of novelty.

The second criterion concerns feasibility in both technical and organizational dimensions. Even when a practice is deemed beneficial, participants note that adoption is improbable if the organization lacks the capacity for implementation, including time, skills, or infrastructural support. Feasibility thus encompasses not only theoretical functionality but also the realistic prospect of transferring the practice into public sector environments given existing administrative conditions. Interviews reveal that this involves the presence of internal expertise to evaluate and manage the innovation, a coordinated implementation structure, and an informed assessment of resource limitations. This constraint is exemplified in Interview 8 where the respondent recounts prolonged delays in technical support and describes having to escalate requests through multiple channels to secure timely response (Interview 8). Such accounts illustrate that positive assessments of a practice do not automatically translate into adoption if organizational readiness is inadequate.

The third criterion relates to economic rationality. Participants emphasize that considerations of cost-effectiveness, value, and financial prudence significantly influence decisions regarding

digital practice adoption. Public sector uptake generally requires economic justification framed in terms of efficiency, resource optimization, or broader cost-benefit analyses. However, the data also reveal that economic rationality alone does not ensure transfer. Some initiatives may appear both technically viable and economically sound yet fail to proceed owing to additional constraints. Notably, Interview 10 highlights cases where initiatives regarded as economically sensible were nonetheless rejected due to issues such as data-sharing restrictions, confidentiality concerns, and political factors (Interview 10). This observation is analytically salient, indicating that transfer decisions extend beyond efficiency calculations. While economic logic is integral, it operates within a wider institutional context where legality, procedural norms, data governance, and political considerations may supersede what might otherwise be deemed technically and economically rational.

4.4 Transfer involves adaptation

Another strong theme from the interview results is that practices, when entering public settings, are reformed rather than simply copied directly. When respondents described the transfer of routines from the private sector to public organizations, they often described this process as a modification of existing practices. Practices are deepened, narrowed, reformed, or even co-opted to fit and align with public-sector rules and expectations. Key conditions influencing adaptation include institutional procedures, reporting requirements, data governance constraints, internal approval chains, and accountability applications. In some scenarios, the original practice survives only in partial form after being transferred to the public environment. Interview 7 described this process very directly: the ministry changed the rules faster than technical specialists could update the portal, so users had to submit forms according to the new requirements while "the portal worked according to the old [rules]" (Interview 7). Interview 3 also described a similar process at the regulatory level. The respondent explained that, after the sandbox phase, authorities planned to introduce prudential norms and increasingly compare crypto-businesses to "classical" financial models, showing that experimental arrangements are gradually reformulated to fit more conventional regulatory structures (Interview 3). This further confirms that transfer is not simply the movement of ready-made models and solutions from the private sector, but a process in which practices are shaped to fit the institutional logic of the state, suggesting that transfer is better understood as institutional translation rather than direct adoption. The public sector does not simply receive some imported routine, rather, it reconstructs this routine to conform to legality, administrative procedures, and public accountability. Adaptation here is not secondary to the transfer, but central to what becomes and passes into practice.

4.5 Collaboration is necessary but difficult

The obtained material also shows that collaboration across sectors is both important and structurally complex. Digital initiatives in Kazakhstan rely heavily on relationships between government officials, quasi-governmental organizations, private suppliers and technical specialists, and intermediaries. In this sense, collaboration functions as a mechanism for transmitting information and as a channel through which practices, tools, and knowledge move to the public sector. At the same time, due to this complex configuration of intra-organizational relationships, participants describe collaboration as a site of constant friction rather than a smooth partnership model. Recurring challenges include dependence on suppliers, limited in-house capacity to assess suppliers, coordination issues between agencies or stakeholders, bottlenecks in the approval process chain, and restrictions on data sharing. Interview 6 illustrates this very clearly: the respondent stated that it is "very difficult" to build integration with state databases and added that

it is often easier to work with resellers because state bodies “do not always respond to requests immediately” and are “not always technically ready” for integration (Interview 6). Interview 8 described a comparable coordination burden from the user side, noting that ordinary technical-support channels were so slow that she had to keep calling multiple contacts in order to move the request forward (Interview 8). These patterns suggest that collaborations between the public and private sectors are not simply an enabling condition. It is itself a governance complexity that shapes whether transfer remains possible, how quickly it will occur, and what practices will ultimately emerge from joint interaction.

4.6 Non-transfer reveals the limits of mobility

Another important finding is that the non-transferability of practices is itself analytically significant. Interviews show that some practices may appear useful, feasible, and even economically practical, but fail to be transferred to government structures. This occurs because institutional, procedural, and political barriers can block adoption even after an initiative passes all practical assessments. The material shows that several such barriers include restrictions on data disclosure, administrative rigor, fragmented stakeholder interest, political unwillingness, and the broader problem of aligning external decisions with internal government procedures. The clearest example comes from the field notes of Interview 4, where some initiatives were viewed as economically reasonable but still not accepted because implementation would have required transferring sensitive data to external partners, including potentially protected infrastructure information such as pipeline maps. Interview 3 reinforces this logic from another angle: the respondent questioned how a digital asset could be sold when a statement from a foreign crypto exchange remained “not a legitimate document” for local authorities, thereby showing that documentary legitimacy itself may block movement of practices across settings (Interview 3). Interview 2 also illustrates how formal rules can constrain action, recalling situations where administrators themselves failed to remove an application on time but still “put the blame on us” for missing the deadline (Interview 2). Non-transferability should not be treated simply as a failed version of success, but something that reveals and demonstrates the limits of the mobility of digital practices across sectors. In this study, rejection, strong narrowing, or even symbolic adoption of measures are all significant outcomes that show how digital transformation in the public sector interacts with the private sector, and how it is shaped not only by what was accepted, but also by what was blocked, postponed, de-emphasized, or labeled institutionally impossible.

5 DISCUSSION

Findings of this study suggest that digital leadership in the Kazakhstani public transformation context is increasingly perceived as a set of governance practices related to implementation rather than a set of individual leadership styles. What is more significant is not the fact that digital leadership lacks leadership traits, but the forms in which leadership is demonstrated. In the data, leadership is expressed as organizing, coordinating, authorizing, and governing digital work within institutional boundaries. This interpretation contributes to digital leadership scholarship by strengthening and consolidating the argument that in today's digital environment, leadership cannot be reduced to personal traits alone, especially in the public sector environment, where transformation depends on collective coordination, formal agreements, and system-level implementation (Adie et al., 2024; Cortellazzo et al., 2019; Van Wart et al., 2019). In this context, the article contributes to an analytical shift in focus from the leader-centric image to governance-in-use as a practical expression of digital leadership.

This understanding is further supported when viewed through both socio-technical lens and practice lens. The data shows that digital leadership is created as a result of governance practices that combine people, data, platform, technical systems, decision-making processes and accountability mechanisms. Thus, leadership here is not merely about declaring the need for change, but it is also about creating the stable infrastructure and standards needed to coordinate and guide the information flows that enable transformations to occur as part of daily organizational life. This understanding is also similar to how organizations are described socio-technically; the purpose of technology is not to support or enhance leadership, but to create structures that define what leadership does in practice (Leonardi, 2011; Weill & Ross, 2004; Khatri & Brown, 2010). This can help explain why there has been little cross-sectoral diffusion of abstract ideas in this study. Instead, there have been many transfers of specific routines, practices, and governance templates from private to public sectors.

In this way, the capacity gap issue becomes more significant than just the observation that states will utilize private suppliers/vendors. The empirical evidence shows that when transferring from a private to a public environment is based on an unequal division of resources (technical and organizational), the public sector will depend on external expertise. As such, there exists a demand for the use of private sector practices due to their operational necessity, not due to attractiveness for adoption. Therefore, transfer appears to be a far less voluntary process and more so a reaction to the growing inequitable distribution of capabilities during digital transformation. The understanding presented above, parallels a broader conceptualization of digital government development that emphasizes the reliance upon external expertise, internal organizational dependencies, and capability building outside of traditional hierarchical structures of governments (Mergel et al., 2019; OECD, 2020, 2021, 2023). When transfer is understood in this manner, the most critical question shifts from "do practices move between sectors?", to "under what circumstances do transferred practices become meaningful/legitimate within the government domain?

The three filters identified in the results are best interpreted as a selective mechanism for practices rather than isolated observations. Relevance, feasibility, and economic rationality together create a structured selection process through which practices are evaluated before they become transferable. This means that practices do not migrate simply because they have been successful elsewhere or because they are accessible through private conduits. They migrate when those in the receiving context assess them as appropriate to an existing, recognized problem and able to operate within the existing settings and sufficiently justifiable within decision-making environment within the public sector. This interpretation connects this finding to the policy transfer and institutional fit literature, where mobility depends not only on accessibility and feasibility but also on the legitimacy, compatibility and organizational acceptance in the receiving context (Dolowitz & Marsh, 2000; Kostova, 1999; Oliver, 1991). Even after passing these three filters, it does not necessarily mean that a practice will enter the public context unchanged.

One important implication of finding is that adaptation is an integral part of the policy transfer process, rather than an afterthought. In the public sector, practices do not enter the public context and then adjust; rather, they move through constant adjustments. This is especially important in public administration, where legality, accountability, procurement rules, inter-agency coordination requirements, and public currency obligations completely reformulate what imported practices can become. Evidence supports the adaptation of practices to the local context, rather than simply copying a model. Under such constraints, practices are selectively edited, formalized, narrowed, or even reformulated within different frameworks to meet institutional requirements. This conclusion aligns with translation theory and public administration scholarship, emphasizing that the public

sector cannot be perceived as a passive recipient of the private sector models, as the publicity changes both the meaning, purpose, and acceptance of government practices (Boyne, 2002; Czarniawska & Joerges, 1996; Moore, 1995; Rainey, 2014; Røvik, 2016). Since translation occurs through intersectoral interaction rather than in isolation, collaboration becomes a central process and also a focal point for major friction between the parties.

This makes collaboration important not only as an enabling condition but also as a governance issue in itself. The findings suggest that government agencies, quasi-governmental organizations, private providers, technical support providers, and intermediaries not only connect existing practices across sectors; they participate in defining what is considered viable practice, who is authorized to manage it, and how this makes it institutionally acceptable. Collaboration therefore involves questions of coordination capacity, interdependencies, assessment capabilities, and boundary management, rather than simple partnerships. This interpretation aligns with the broader public governance debate, which frames cross-boundary coordination as a central goal and complexity of the digital state, especially where transformations depend on shared infrastructures of external expertise and collaboration, and agreements on joint delivery (Mergel et al., 2019; OECD, 2014, 2020; Ospina, 2017).

For these reasons, non-transfer of practices should be perceived theoretically as meaningful, rather than as failure or lack of success. The material suggests that blocking, slowing down, excessively narrowing or symbolic adoption of practices reveals the institutional barriers within which digital transformation resides. Specifically, non-transfer highlights the power of legislation, procedural rigor, public accountability, political constraints, and institutional logics that determine how and which private sector routines can be transferred to public governance. This is a crucial corrective to narratives about transfers, as it lends particular significance to successful adoption. Non-transfer can be as indicative as the transition of practices, because it reveals where institutional conformity breaks down and where symbolic agreements diverge from accepted practices (DiMaggio & Powell, 1983; Meyer & Rowan, 1977; Oliver, 1991). In this study, non-transfer is not simply a negative outcome but a significant indicator of how digital transformation is constrained in the public sector.

Kazakhstan is a valuable case precisely because these dynamics become particularly visible in the context of a digital governance environment. It underscores the conditions in which transfer and non-transfer adaptation can be seen not as exceptional events, but as recurring themes and as an aspect of digital transformation. The broader implication is that in transitional or capacity-differentiated administrative settings, digital change may depend less on the import of idealized practical models, but more on institutionally visible and viable agreements for negotiating these practices. In this light, Kazakhstan is useful not only as a national case study but also as an analytically informative setting for understanding how ambitious digital reforms interact with public accountability and practical implementation constraints.

Results of the study suggest that the cross-sector transfer of digital leadership and governance practices is best understood as contingent movements and adaptation based on capacity constraints, the ability to collaborate and institutional fit. Consequently, it is based on a contingency leader style which seeks to adapt leadership practices to the prevailing context. Further research is needed to confirm the consistency of these patterns across organizations, sectors, and types of digital initiatives. However, even at this stage, the findings suggest a more precise way to conceptualize digital leadership and its transfer in public transformation: not as diffusion or abstract leadership ideas, but as a context-bound translation of governance routines in practice (Adie et al., 2024; OECD, 2020; Vial, 2019).

6 LIMITATIONS OF THE STUDY

Since this article is based on 11 semi-structured interviews, the primary goal is to generate contextually grounded insights rather than broad statistical representativeness. Therefore, the findings should not be perceived as a generalization applicable to all private and public organizations in Kazakhstan, but rather as a qualitative interpretation derived from the interview sample (Maxwell, 2013; Patton, 2015; Yin, 2018). While the sample includes participants from diverse institutional positions across the Kazakh digital landscape, it did not cover the full range of organizational conditions, sectoral experiences, and managerial perspectives. Furthermore, qualitative interview research draws on the participants' situational experiences and the interpretive logic of thematic analysis. These limitations define the scope of the study, which focuses on the conditions of transfer, mechanisms and constraints of adaptation through which digital leadership and governance practices travel across sectors in Kazakhstan.

7 CONCLUSION

This paper examined how private sector digital leadership and governance practices are integrated into public sector digital initiatives in Kazakhstan, and under what conditions these practices are adapted to the public sector context. The article addressed the gap in the literature on digital government, which primarily focuses on state reforms and service transformation, and the digital leadership literature, which often reflects leadership capabilities and organizational change. By applying a practice-oriented approach to digital leadership and a focus on organizational practices, the article tries to address the issue of what practices government organizations are transferring from the private sector, how these are adapted, and why some practices are not accepted.

Findings suggest that digital leadership is framed less in abstract leadership meanings and more in terms of concrete governance and sociotechnical routines. In interviews, respondents, when describing digital leadership, referred to platforms, integration processes, analytic tools, verification mechanisms, reporting procedures, and implementation support providers, rather than visionary leadership, managerial personality, or individual traits. What appears to be cross-sector transfer is thus formulated as a narrow leadership model focused on more specific operational practices and government agreements. At the same time, practice adoption is not automatic; it is filtered based on perceived relevance, implementation feasibility, and economic rationality, while it also remains dependent on broader institutional requirements and the acceptability of procedures within the public sector. When practices are transferred to public sector contexts, they are not simply copied but translated and adapted to fit procurement rules, accountability requirements, data restrictions, inter-organizational coordination demands and to public value requirements. Findings also show that non-transfer is an important result in itself, since some practices, even when filtered, may end up blocked or inhibited.

The article contributes to the literature three levels. First, conceptually, it supports the view of digital leadership as governance-in-use, manifested through routine infrastructure and coordination mechanisms, rather than perceiving digital leadership as based on individual traits. Second, theoretically, it redefines core sector transfer, demonstrating that collaboration, adaptation, and even the blockage are central parts of the process, not secondary components. Third, empirically, the article offers evidence that in Kazakhstan's digital transformation environment, the transfer of practices across public-private boundaries is simultaneously active and constrained. Methodologically, the article remains cautious, claims are exploratory and based on the limited

qualitative dataset, but this limitation does not diminish its value. On the contrary, it allows the study to identify emerging mechanisms and analytical directions that can be further tested and more deeply explored through a broader research project beyond this study.

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Analyzing the Relationship of Digitalization and Health on Labor Productivity in Kazakhstan (2012 – 2024)

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ABSTRACT

Building on the foundational human capital studies by Grossman, this paper utilizes ordinary least squares (OLS) regression to investigate the relationship between health indicators proxied by hospital beds availability per 10,000 people, household internet access percentage, and urbanization on labor productivity in Kazakhstan between 2012 - 2024. We found that urbanization rate and hospital beds yield a negative relationship, while internet access boost labor productivity. This study provides insight into the macroeconomic inference of these variables over a 13-year timespan.

INTRODUCTION

In the evolution of economic growth theories across generations, labor productivity has become the primary drive of sustainable economic growth that is driven by physical capital and human capital components such as education [1]. However, the Grossman (1972) model identifies health as a "durable capital stock" that is equally fundamental; healthier workers are more likely to get more work done as they are less prone to absenteeism, directly enhancing their productivity [1]. Empirical evidence confirms that reducing mortality and leads to long-run GDP growth [2].

In the era of Industry 4.0, the drivers of productivity have become increasingly complex. According to Coupled Coordination Theory, the digital economy and public health are no longer isolated sectors but are "coupled" systems that mutually reinforce one another. Due to limited years of observation, this paper utilizes Ordinary Least Squares instead of Multivariate Regression to investigate the interaction between hospital resources, internet access, and urbanization in Kazakhstan between 2012 to 2024 to determine how these indicators influence labor productivity.

The structure of this paper is as follows: Literature Review section reviews the theoretical framework in the literature; Methodology section outlines the research methodology and data sources; and Result and Discussion section, presents the empirical results and discussion.

LITERATURE REVIEW

We built the foundation of our paper on the study conducted by Grossman in 1972 that highlights health as the endogenous capital in increasing labor productivity. Health was historically seen as an exogenous indicator in economic growth. Grossman's study significantly highlights that health is a capital that individuals can invest in [1]. Moreover, it directly impacts on the total productive hours, with education level among individuals determines how they invest in their health quality [1].

Several recent studies have proven digitalization's contribution to labor productivity. Within the context of Small Medium Enterprises, in Vietnam for instance, it significantly boost labor

productivity by 0.46 through tasks automation, allowing workers to focus on more demanding tasks [3]. In Kazakhstan, expenditure in ICT and digital literacy have become the primary factor of efficiency improvement in decision making within the medical system [4]. The significance of digitalization lies in its ability to boost production efficiency which in result boost economic growth [5].

A systematic review conducted by Bondanini et al. (2025) highlights the impact of digital tools usage, such as steady internet connection resulting in an increase of people's productivity levels by up to 59% compared to those with poor connectivity [6]. However, it also acts as a double-edged sword as people tend to get easily burned out, as the productivity level increases – noted by 'zoom fatigue' that causes people to experience trouble sleeping at night due to high screentime [6].

Regarding variable selection in quantitative literature, Wei et al. (2025) explicitly use hospital beds per 10,000 people as a key indicator for material resources within their healthcare investment framework. While Chen et al. (2025) utilize similar approach by using beds per thousand to measure medical resource input [7]. Internet broadband penetration was utilized as a variable to analyze digital economy [2]. Urbanization rate was included in previous studies to capture both the region's development stage and spatial structure. It serves as a control to account for agglomeration effects, ensuring that observed economic growth is accurately attributed to health or technology factors rather than just the benefits of population clustering [2].

While these studies have provided significant contributions to the growing discussion of digitalization and health contribution to economic growth, the discussion within the scope of Kazakhstan in this topic remain limited. This paper aims to analyze the impact of both indicators to labor productivity in Kazakhstan, specifically between 2012 to 2024.

METHODOLOGY

We gathered annual secondary data from the Bureau of National Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan from the year 2012 to 2024. Our dependent variable is Labor Productivity, whereas our independent variables include the availability of Hospital Beds per 10,000 people, the percentage of households with internet access (digitalization indicator). We utilize urbanization rate as our control variable. The model utilizes linear – linear form specified as below:

$$labprod_t = \beta 0 + \beta 1 beds_t + \beta 2 internet_t + \beta 3 urbrate_t + \varepsilon_t \quad (1)$$

Then we employ Ordinary Least Squares Regression as our primary method to estimate the coefficients. We implemented VIF test to check for multicollinearity, Breusch-Pagan (to check for heteroskedasticity) and Huber-White (HC3) as our robustness adjustments. Our diagnostic testing framework includes Breusch Godfrey (checking autocorrelation), Shapiro-Wilk test to confirm the normal distribution of the residuals.

Table 1. Variables Description

Variable	Description & Unit of Measurement
Labor Productivity (Y)	Real growth index of labor productivity compared to the previous period (Base = 100%)
Hospital Beds per 10,000 people	The density of healthcare infrastructure in Kazakhstan. Measured as absolute units.

Households with Internet Access	Percentage (%)
Urbanization rate	Percentage (%)

RESULT

Table 2. Correlation Matrix

Variables	Labor Productivity	Hospital Beds per 10,000	Internet Access %	Urbanization rate
Labor Productivity	1	-0.39682233	0.06257443	0.04256848
Hospital Beds per 10,000	-0.39682233	1	0.08594973	0.04478872
Internet Access %	0.06257443	0.08594973	1	0.77004443
Urbanization rate	0.04256848	0.04478872	0.77004443	1

Table 3. Regression Result

Variable	Coefficient (β)	Robust Std. Error	t-statistic	p-value	VIF
(Intercept)	112.00	45.62	2.4554	0.03643*	
Hospital Beds	-0.00009304	0.00	-0.53	0.61	1.0085
Internet Access	0.03	0.66	0.05	0.96	2.472
Urbanization Rate	-0.04	1.54	-0.03	0.98	2.459

Observations	**13.00**
R-squared	0.17
Adjusted R	-0.11
F-statistic	0.6031 on 3 and 9 DF
Breusch – Godfrey	0.6478
Breusch – Pagan	0.1421
Shapiro – Wilk	0.1752

Final model based on the coefficients:

$$labprod_t = 112 - 0.00009304 Beds_t + 0.03255 Internet_t - 0.0387 Urbanrate_t + \varepsilon_t \quad (2)$$

DISCUSSION

The model passed the fundamental validity tests such as Gauss-Markov assumptions to ensure unbiased estimations. The result of Shapiro-Wilk test confirms that the residuals are evenly distributed ($p = 0.1752$). The model has passed autocorrelation test, proven by the Breusch-Godfrey test ($p = 0.6478$), and the Breusch-Pagan test's ($p = 0.1421$) result proven that the model does not have heteroskedasticity. The absence of multicollinearity between variables was proven by VIF result all below 5.

From the result, we can see that the independent variables explain 17% of the variance in the labor productivity index. The Intercept ($\beta = 112.00$) is statistically significant ($p < 0.05$), establishing a stable baseline for productivity within the period. The regression result suggests that one addition in hospital bed per 10,000 people lower labor productivity even though the value is quite small (0.00009304). This aligned with the expected result as adding beds indicates sick people

which means an increase in absenteeism. Access to digitalization proxied by percentage of internet access from home shows a positive direction ((β = 0.03255). Urbanization rate lower labor productivity may be attributed to an increase in labor with lower job opportunities. Although the variables did not reach statistical significance, the result gives us an overview analysis in the period of 2012 until 2024. To get the robust macro level analysis of Kazakhstan, larger observation size is needed.

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Using Virtual Reality in Environmental Education: A Case Study of the Aral Sea

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ABSTRACT

Environmental challenges require innovative educational approaches, particularly in regions affected by ecological crises such as the Aral Sea. Traditional teaching methods often fail to effectively engage students with complex environmental issues. This paper explores the potential of virtual reality (VR) technologies as a tool to enhance environmental education and promote sustainable awareness.

The study focuses on the application of VR in teaching the English language and consequences of the Aral Sea disaster. By using immersive simulations, students can better understand environmental changes and their long-term impact. VR enables experiential learning, making abstract concepts more tangible and emotionally engaging (Radianti et al., 2020).

This research is based on the author's academic experience during an Erasmus+ mobility program in Bamberg, Germany, where exposure to digital tools and innovative teaching methods inspired the development of a VR-based educational approach. During this period, a project on integrating VR into environmental education was successfully developed and defended. As part of the project, a 360-degree virtual environment was created using the AR2VR application, allowing users to experience immersive visual content related to environmental topics.

Previous studies have shown that immersive technologies can significantly improve student motivation and learning outcomes (Makransky & Petersen, 2019). This supports the argument that VR can be effectively integrated into educational systems to address sustainability challenges.

In conclusion, integrating VR into environmental education can contribute to sustainable value creation by equipping students with knowledge and awareness necessary to address global challenges.

KEYWORDS: Virtual Reality, Environmental Education, Aral Sea, Digital Learning, Topic-based English language Teaching

1 INTRODUCTION

Environmental sustainability has become one of the most urgent global challenges of the 21st century. Regions affected by ecological crises, such as the Aral Sea, require increased awareness and education among younger generations. However, traditional educational methods often fail to effectively communicate the scale and complexity of such environmental problems.

In recent years, digital technologies have begun to transform the educational landscape. Among them, virtual reality (VR) has emerged as a powerful tool for enhancing learning

experiences. VR allows users to immerse themselves in simulated environments, making learning more interactive and engaging compared to conventional approaches (Radianti et al., 2020).

This paper aims to explore the role of VR in environmental education, focusing on the Aral Sea crisis as a case study. The research is based on practical experience gained during an Erasmus+ mobility program, where innovative digital tools were integrated into the learning process. The objective is to analyze how VR can improve student engagement and understanding of sustainability issues.

2 METHODOLOGY

This study adopts a qualitative approach based on project-based learning and practical teaching experience. The research was conducted during an Erasmus+ mobility program in Bamberg, Germany, where exposure to innovative teaching methods and digital tools inspired the development of a VR-based educational project.

As part of the study, a 360-degree virtual environment was created using the AR2VR application, focusing on the environmental changes of the Aral Sea. In addition to the development of the project, a 45-minute lesson was designed and conducted for 9th-grade students within the framework of an English language class. The lesson was part of the course "Virtual Reality & English Language Teaching."

During the lesson, students were introduced to the Aral Sea crisis through immersive VR content and visual materials created by the author. The integration of VR into language learning allowed students to engage with both environmental and linguistic content simultaneously.

Observational data was collected based on student engagement, participation, and feedback during the lesson, providing insights into the effectiveness of immersive technologies in education.

3 RESULTS AND DISCUSSION

The results of this study demonstrate that virtual reality can significantly enhance both environmental awareness and language learning outcomes. The conducted lesson showed a high level of student engagement and interest. Many students were previously unaware of the Aral Sea crisis, and the immersive experience helped them better understand the scale and importance of the issue.

The use of VR technology in an English language classroom also contributed to improving students' vocabulary and communication skills related to environmental topics. Students actively participated in discussions, asked questions, and expressed their opinions using newly acquired language skills.

Furthermore, the immersive 360-degree visual experience created a strong emotional response, which increased motivation and retention of information. These findings are consistent with previous research indicating that VR enhances learning engagement and comprehension (Radianti et al., 2020; Makransky & Petersen, 2019).

However, the study also highlights challenges related to accessibility. While such technologies are widely available in countries like Germany, their implementation in Kazakhstan remains limited. This gap creates inequality in access to innovative educational tools.

4 CONCLUSION

This paper highlights the importance of integrating innovative digital technologies into environmental and language education. The use of virtual reality not only improves student engagement but also enhances interdisciplinary learning by combining environmental awareness with language development.

The practical implementation of a VR-based lesson demonstrated the effectiveness of immersive learning approaches in real classroom settings. Students showed increased interest, improved understanding of environmental issues, and enhanced language skills.

Based on this experience, it is recommended to expand the use of VR technologies in educational institutions in Kazakhstan. Increasing access to VR tools, such as headsets and interactive platforms, could significantly improve the quality of education and align it with international standards, as observed during the Erasmus+ experience in Germany.

Future work should focus on implementing pilot programs and training educators to effectively integrate VR into their teaching practices.

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Automation of Managerial Decision-Making in the Media Industry Using Artificial Intelligence: Evidence from Kazakhstan

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ABSTRACT

As a result of the fast-paced digital transformation, the growing flow of information, and the increasing competition in the media industry in Kazakhstan, the traditional methods of making managerial decisions are being revealed as inefficient. The objective of this research study is to investigate the use of artificial intelligence (AI) automation to support decision making in order to improve the efficiency of management systems. AI offers a wide range of tools that leverage big data to perform analysis, recognize trends and patterns, make predictions, and support decision making. Media organizations are using these technologies to better understand their audience, evaluate the performance of their content, improve the effectiveness of their advertisements, and enhance their long-term strategic planning. This study will be conducted using a combination of qualitative research methods through a review of the literature and quantitative research methods through an online survey. We will also be looking at the factors that affect the effectiveness of solutions developed using AI, such as the quality of the input data, the organisational readiness to use AI. We anticipate that the findings of our study will support the positive effect of AI on the efficiency, speed, accuracy and overall quality of management decisions as well as assist in developing optimal conditions for the effective implementation of AI.

Key words: Artificial Intelligence, management, leadership, media industry, automation, strategy, decision-making.

I. INTRODUCTION

This study aims to explore determinants for automation of managerial decision – making in the media industry using artificial intelligence. This chapter includes the research background and motivation, research purpose, research process.

The rapidly changing commercial world is marked by a rapid increase in data volume, growing technological change and great uncertainty. These characteristics of modern business have made managerial decision making much more complex with the need for data-driven, faster and more accurate processes. With the digital transformation of the media sector and the convergence of platforms, fragmented audiences and increasing competition for advertising revenue and consumer attention, the media sector is one of the most threatened industries from these changes (Napoli, 2019). Therefore, AI (Artificial Intelligence) is now being relied on as the most important management resource for automation and support of decision-making processes. The term AI describes any computer system that can complete tasks that would usually require human thought, such as learning, reasoning, identifying patterns and making predictions and decisions (Raisch & Krakowski, 2021; Shrestha et al., 2019). The various applications of AI within a business context include machine learning algorithms, predictive analytics, recommendation engines and automated

decision support tools. The application of AI to the managerial function allows managers to leverage large data sets and identify trends, predict future results and evaluate strategic options with increased efficiency over traditional analytical processes. Research has shown previously that artificial intelligence (AI) can help decision-making, reduce cognitive bias, and enhance the effectiveness of organizations through the use of evidence-based management (Shrestha & others, 2019). AI is being used more often in the media industry for things such as audience analysis, evaluating content performance, optimizing advertisements, forecasting demand, and developing strategies for the future (Thurman & others, 2021). AI analytic tools used by global media firms inform their content investment decisions, allow them to optimize their distribution strategies, and help them allocate resources more efficiently (McKinsey Global Institute, 2018). Empirical evidence has found that using AI to enhance decision-making improves efficiency, accuracy, and responsiveness to changes in the market for data-rich industries like media (PwC, 2020). While previous research has studied AI adoption in developed economies (Raisch & Krakowski, 2021; Shrestha & others, 2019), there is a lack of studies examining emerging markets (i.e., Vial, 2019). In addition, much of the literature has focused on technology implementation instead of its impact on the effectiveness of managerial decision making (Davenport & Ronanki, 2018).

Empirical studies that directly connect AI to decision-making performance in media organizations have little literature supporting them. Most of the current studies are focused on large media companies in industrialized countries (e.g., the US, and Western Europe), and there is a lack of data on developing regions like Central Asia. In addition, there are few studies today that use technology or operational perspectives to study AI; there are, however, few studies that focus on how AI is being used to assist management in making both tactical and strategic decisions. This is particularly relevant to Kazakhstan. Over the past decade, Kazakhstan has undergone rapid digital transformation, increased online media, and increased use of data-driven approaches to business.

However, many media organizations are still struggling with management-related issues such as performance measurement, strategic planning, and resource allocation. This study investigates how AI is used to automate management decision-making within the media sector in Kazakhstan, in light of the above deficiencies. The study will use secondary data, empirical data, industry reports, and conceptual models to provide a comprehensive analysis of the role AI plays in automating decision-making processes in the developing market (Johnston, 2017).

The purpose of this study is to fully examine the factors that influence the successful implementation of AI technology to automate the process of management decision-making within the media sector in Kazakhstan. The study will be carried out using a methodology comprised of two components: analysis of secondary data and surveys.

The purpose of this study is as follows:

- The systematic review of scientific literature and secondary data to determine which factors play the most significant role concerning the success of implementing Artificial Intelligence in management processes.
- An examination of Artificial Intelligence applications currently in use within the media industry based on secondary information and proof through actual business scenarios and employee experiences.
- Developing and implementing a protocol for administering a quantitative survey aimed at gathering empirical evidence of the use of Artificial Intelligence in management decision-making processes within media organizations.

- Conducting a quantitative assessment of the various determinants' impact and significance on the effectiveness of management decisions using data from the surveys.
- Investigating the relationship between the level of Artificial Intelligence integration and qualitative/quantitative measures of the effectiveness of management decisions.
- Providing scientifically based practical recommendations that optimize decision-making processes in media organizations through the use of Artificial Intelligence technologies.

This study was designed to carry out a comprehensive analysis into the various factors that contribute to the success level of automating management decisions in AI for the media industry. As digitalization and data are increasing at a rapid rate, media organizations are increasingly using AI in order to expedite and enhance their decision-making processes; however, the success of these technologies depends upon several systematically researched factors.

A thorough review of the existing scientific literature (secondary data), comprising of articles, reports produced by international organizations, and textbooks/periodicals on the use of artificial intelligence in management and media (in both fields for both sets of literature), was conducted at the outset of the research. This research enabled us to determine the primary theoretical principles of automated management and provide insight into the critical success factors associated with the implementation of automated management, including: 1) data quality; 2) the level of technological readiness of the organization; 3) the level of competency of employees; and 4) the level of integration of AI (automated management, if business will) into business processes. This research resulted in the development of a conceptual research model that served as the basis for a questionnaire utilized to collect quantitative data regarding media representatives' opinions about and experiences using AI in the implementation of decision-making functions. Following the completion of the questionnaire, a set of online surveys of media representatives, including managers and employees who have some decision-making authority, were conducted. The data collected was used for quantitative analysis to determine patterns in AI usage. The data mining and analysis were conducted using quantitative techniques including descriptive statistics and comparative analysis. Using AI technology in administrative functions faces many challenges that hinder widespread use in Kazakhstan. To assess the importance of different factors and evaluate how they affect the efficiency of automation of management decision-making, this research focused specifically on determining the relationship between the implementation rate of AI and the improvement in management decision quality. The research identified the key factors that influence how well AI works in Kazakhstan’s media industry. As such, the research findings could provide guidance for managers wanting to adopt AI, as well as serve as a foundation for more scientific research going forward.

II. Literature Review

The arrangement of this chapter will allow for the consistent demonstration of important elements to realize the proposed objectives of the research. The first section will consist of a critical review of theoretical approaches that describe the factors which drive the success rate of management decision automation using AI. The second part will provide an analysis of the main management theories and decision-making theories. The third and final part will provide an overview of the current state of the media industry as it relates specifically to the development of the media industry in Kazakhstan.

Theory of AI in managerial Decision – Making

The goal of this study is to identify key factors that will affect the ability for organizations to successfully implement AI for automation of management decisions. Factors that will influence the success of this effort are: sufficient conditions, available resources, and developed competencies. Without these factors in place there can be no effective way to successfully apply AI to enhance the quality of organizational decision – making.

Theoretical Definition of AI in Decision – Making

The term 'critical success factors' (CSF) has been a frequently discussed topic in both the literature and practice of strategic management and organizational theory. In academic writing, there are several interchangeable terms for CSFs including "key success factors," "strategic factors," and "critical areas of activity" (Rockart, 1979; Aaker, 2004). An organization can achieve a competitive edge through excellence in these areas; conversely, poor performance in one or more of these areas can result in lower productivity and loss of competitive position (Daniel, 1961).

The factors are identified as the essential areas where an organization must perform successfully to achieve success. Although the specific factors vary among industries, researchers identify the factors from the industry characteristics, competition characteristics, external characteristics (economic and technological trends) and the development of the organization (Miller & Dess, 1996). With regard to the use of AI to assist with management decisions, factors include the quality of the source data, level of technology infrastructure, employee competency, organizational preparation, and how well the AI will be integrated into business processes. Each of these factors can significantly improve or hinder the effectiveness of automating decision-making (Brynjolfsson & McAfee, 2017; Davenport & Ronanki, 2018).

Key success factors (KSFs) are integrated with the overall definition of factors; i.e., areas that an organization must achieve exceptional performance in order to effectively execute its strategy. A sustainable competitive advantage results from an alignment between an organization's strengths and these KSFs (Aaker, 2004). Therefore, the study defines factors as a collection of the most relevant requirements, resources, and capabilities that directly impact on the successful use of artificial intelligence in the management of decision making and enhance their effectiveness.

Determinants of Effective AI Implementation

There are many different factors that influence how successful an organization will be when integrating artificial intelligence (AI) into its management processes beyond just technology, such as human resource capabilities, organizational conditions and external conditions (Davenport & Ronanki, 2018). Having a clear understanding of these various factors is essential for maximizing the overall quality and effectiveness of an organization's management decisions. The most important factor impacting the success of an AI system is the quality and availability of data. The effectiveness of AI systems depends heavily on large volumes of accurate, relevant and structured data; poor quality of data can result in excessive errors which will reduce the overall effectiveness of the decision-making process (Brynjolfsson & McAfee, 2017). Thus, managing and providing access to data is one of the most critical prerequisites to successfully deploying an AI system. Additionally, IT infrastructure is also an important factor. In order for an organization to successfully deploy an AI system, it must have access to modern IT infrastructure including sufficient computing power, sufficient storage of data, and sufficient capability to integrate with existing IT systems. An organization without proper IT infrastructure will face many challenges and be unable to deploy an AI system (Bughin et al., 2018). Furthermore, the compatibility of new systems with existing systems is another critical component to successfully deploying an AI system. Human capital and human resource capabilities are critical components impacting the

success of an AI system. Specialist professionals with associated technical know-how and the skills to understand AI results will be critical for AI to be effectively implemented. Insufficiently qualified personnel significantly reduce the potential for implementing AI (Jarrahi, 2018). The need for training and/or advanced training programs is emphasized as AI is implemented. Organizational readiness and culture are another important factor. Organizations that have demonstrated a culture of accepting change through innovative processes (e.g., new using technology as a tool for business) are better able to implement AI, whereas organizations that are resistant to change and do not trust in technology typically slow down the implementation process (Ransbotham et al., 2020). Establishing a culture of data use and innovation ultimately drives effective use of AI within an organization. AI must be implemented on a continual basis throughout management's existing processes (rather than isolated applications) to ensure value to AI-generated results and to enhance the use of those results in supporting business decisions (Davenport and Ronanki, 2018). Management support and strategic coherence (i.e., managing metrics in a holistic manner) of an organization's goal are also critical to achieve the envisioned results of an AI-enabled business. When AI meets the greater objective of an organization, the results from AI will be optimized and will have the greatest impact on the organization's bottom line (Bughin et al., 2018). Furthermore, you must consider factors outside of the company, such as the regulatory environment for your industry. This is especially true for industries like media, where technology evolves rapidly and competition is high, and the introduction of artificial intelligence represents significant opportunities and challenges; therefore, a focus on ethical (Floridi et al., 2018), legal regulations and issues of data protection is particularly necessary in this arena. Therefore, successful implementation of artificial intelligence in management decision-making depends on the combination of technology, organization, and employee factors. By considering these factors, a company can maximize its use of the potential of artificial intelligence and achieve long-term competitive advantages.

III. METHODOLOGY

The purpose of this research is to determine which characteristics affect how well automation of media management decisions takes place through Artificial Intelligence – focusing on Kazakhstan as an example.

To reach this end goal, we carried out the following tasks:

- To determine which key factors are associated with the successful use of artificial intelligence (AI) in management by reviewing and analyzing scientific literature (secondary data) to assist with this determination
- Assessing the current state of AI utilization within the media industry
- Conducting quantitative research to gather first-hand information on how AI is currently being utilized by media professionals when making management decisions
- Assessing how each of the factors listed above impacts (positively or negatively) upon the quality of management decisions made by media organizations as a result of AI
- Establishing the relationship between AI utilization and the quality, efficiency, and legality of management decisions made by media organizations
- Making recommendations to media professionals on ways to improve the successful use of AI to enhance their organizations' performance

Research Methodology

Use of a combination of secondary and primary research methods will be used in developing the research methodology for this study. The combination of these methods allows for both a theoretical framework to justify the research as well as for the acquisition of empirical data, to validate the theoretical framework, which describes the actual conditions relating to the application of AI in media.

The initial phase of the research process has been conducted using available literature, consisting of academic journals, trade publications and other sources available to researchers. The purpose of this phase was to identify the critical characteristics that influence the implementation of AI systems for the effective decision-making process throughout an organization. The characteristics identified include the accuracy of and nature of the data, the technological readiness of the organization and the level of proficiency of the employees that interact with the AI systems. Additionally, during the literature review, we analyzed the use of AI within the media companies, including the personalization of content and the automating the preparation of news articles. After the completion of the literature review, the use of a quantitative research instrument through the administration of a questionnaire will be conducted as the next phase of the research methodology for this study. In developing the questionnaire, both fixed response questions and a rating scale were used (e.g., Likert scale). The purpose of the questionnaire was to assess the level of AI use and the impacts of AI on management processes and to identify factors that supported or detracted from the technology's effective use. The respondents evaluated the contribution of AI to more rapid decision making and to enhance objectivity in their work. A survey was completed by multiple media professional types in the media industry such as managers, marketers, and content managers working for news portals, digital agencies, or media organizations using analytical tools and personalization algorithms.

After collecting the data, the information from the research was analyzed with a quantitative methodology. Data collected from this study was analyzed by using descriptive statistics, such as means, percent distributions, and comparisons between the responses of participants by experience or integration level of AI in their organizations. Therefore, the methodology chosen provides a comprehensive, organized analysis combining both theory and empirical data from the media industry that allows for both identification of key factors of AI and validating the impact of those factors with real examples in the media industry.

Secondary Research (Literature Analysis)

The second part of the work consists of tools and methods for Analyzing the impact of AI. As stated in the introductory section, 3 stages of evidence have been undertaken for investigating the impact of AI used in decisions from a quantitative standpoint. The analysis of the variables and conditions under which AI is effective is included. Statistical analysis will also be conducted on the sample using PDF's and will be presented in numerical formats. The statistical analyses will also provide quantitative data about how the variables; i.e. AI-based management system; have an impact on management decision creativity and the success of organizations. Overall, the findings will demonstrate how these factors influence the automation of management decisions based on the use of AI. In addition to using a statistical analysis approach, subsequent analyses, including graphical illustrations of decision processes through which decision-making and factors associated with automation will be completed.

Conducting both qualitative and quantitative analysis will allow us to ascertain the linkages and to identify the nature of AI-based decisions and how they relate to the success of organizations.

The methodology will be based on the use of the research framework developed for them. Ultimately, the methods of study will be reviewed, assessed, and evaluated. There are a number of factors that will determine the successful transformation of an organization to include the quality of the data being processed; the extent to which a technological infrastructure is developed; staff expertise; and on the organization's capacity to facilitate the transformation (Westerman et al., 2014). Organizations that have already developed a strong digital infrastructure are typically able to innovate more rapidly and achieve better results than organizations that do not have such a platform when implementing projects based on AI. The analysis of secondary sources suggests that there is a wide-ranging use of AI across a number of industries for the automation of various business processes. According to research, automation in general creates efficiencies and reduces costs (Author, 2015). For example, in the media sector, AI technologies are currently being used to develop news content, audit and analyze data, and improve the efficiency of advertising campaigns. The media sector study indicated that AI will continue to impact the methods in which content is produced and distributed. Reports issued by the Reuters Institute and other studies show that there is a strong trend in the media industry toward integrating algorithms within digital media to create personalized news feeds and improve audience engagement (Newman, 2023). For example, suppliers of digital media are using algorithms to identify content that is most relevant to individual users within the database. In addition, the literature references provide several examples of how AI enhances user experiences and increases profits. According to research, the use of personalized content and targeted advertisements can be beneficial financially to media companies (Chaffey & Ellis-Chaddick, 2019). For instance, many advertising platforms will utilize user data – behavior, preferences, etc. – to provide relevant offers, but they are facing challenges and limitations as a result of these activities. Ethical issues, algorithmic transparency and increased risk of breaching consumer data privacy are three examples of these challenges. In some cases, algorithms can result in increased discrimination against certain groups and create 'information silos', whereby individuals only have access to limited sources of information. As AI develops, the pace at which developed countries adopt and implement AI solutions will largely depend on the level of digital maturity that exists in the given region. In developed economies, there are sufficient resources and infrastructure in place to utilize AI solutions (OECD, 2021). Additionally, Kazakhstan's digital economy has also been undergoing a similar transformation, although at a much higher rate than other countries with developed digital economies. Further analysis of previously published literature provided insight into theoretical concepts, an understanding of major factors affecting the adoption of AI, as well as illustrative examples showcasing real-world applications of AI, all of which served as the foundation for our subsequent empirical study and the development of a questionnaire. Utilizing secondary data for research purposes allowed for reliable outcomes and allowed the author to support the research findings with an extensive body of scientific and practical literature.

Survey Method (Questionnaire)

For this study, the primary source of data will be through quantitative survey methods of which the structured questionnaire will be the main instrument to gather data from large samples of respondents therefore allowing patterns to be identified, cause and effect relationships to be defined, and generalizations of the results drawn. The appropriation of survey instruments or questionnaires is extensive throughout research in both the fields of management and information technology, as these instruments are capable of providing empirical evidence about how an organization perceives (or has developed) their accumulated experience and how they rate the effectiveness of technologies they utilize within their organization(s). The purpose of this

questionnaire for this study is to examine the use of artificial intelligence within the management function in the media industry and to determine what factors may affect the successful use of artificial intelligence within a management role. The instrument itself was based on the review and analysis of existing literature and the theoretical concepts/constructs that were identified. The content of the instrument has been developed into several logical sections. The first block of questions was designed to provide demographic data and professional information about survey respondents, such as their position in the organization, how long they have worked for their current employer, and the industry in which they currently work (i.e. media, digital agency, or related), etc.

Participants were questioned on how much AI has been put into use by the participants. Such examples of AI usage are found with, but not limited to: Information analysis, production of customized materials, automation of reporting data, and forecasting future trends. The third portion of the survey responses evaluated AI effectiveness through a level of agreement scale. This scale measured how much the survey participant agreed with the statements outlining the effect of AI on quicker decision-making; and how much AI provides a higher quality of decision-making outcome; and how much AI reduced the frequency of errors in decision-making. The fourth portion of the questionnaire was to define the major factors impacting the implementation of AI technology. The participants will determine how valuable the following four (4) aspects are for successfully implementing AI technology: Quality of the source data, Level of Technology development, Commitment from Senior Management, and Level of Employee skill. In the open—ended responses there were also opportunities for free responses in the form of answering questions regarding participant experiences of any difficulties encountered while using AI and how to better utilize AI. Data was gathered using online methods such as Google Forms, which allowed for multiple users to complete the questionnaire while providing a way for the data collection to occur on a large scale. The survey referenced was completed by media professionals in a variety of roles including managers, marketers, and content managers representing people who work for news organizations, digital media companies, as well as television and radio stations. The use of quantitative analysis is advantageous in that it allows for statistical analysis of the results and allows for the discovery and confirmation of objective relationships between the concepts used. The use of a standard questionnaire further assists in allowing for an aggregate comparison of the data collected and it increases reliability of the overall result. However, quantitative analysis does have drawbacks that must be considered when utilizing this type of approach. Such problems include but are not limited to the expectation that survey response data will be subjective in nature not necessarily reflecting the population of similar professionals. However, if the questions are well constructed and/or provide an adequate number of respondents, these problems can be reduced. Thus, the questionnaire method becomes a useful tool in acquiring basic information relevant to the study and provides a means of gathering empirical data for the use of artificial intelligence in media and of determining the primary factors that influence management's effectiveness.

Questionnaire Design and Structure

In this study, the main objective was to develop a questionnaire as a means of gathering primary data that would be used for assessing the use of artificial intelligence (AI) within the management practices of Kazakhstan's media sector. The questionnaire was designed with thought to theoretical bases from the literature as well as the aims of the research and the conceptual model being utilized, known as the TOE framework (Technology–Organization–Environment). A structured online survey conducted on Google Forms was selected to collect responses from 151 people representing companies such as JKS Entertainment; Jas Agency; Brave Talents; Insider; Qamalladin Media; and 2any1. The use of Google Forms enabled a more efficient method of

collecting and processing data than what would have been possible if the survey were submitted via a different medium (e.g., email). The survey was broken down into three sections that related to the ways AI is used to support management. These sections included demographic data; information about the types of jobs the respondents held; their levels of influence in an organization; and how long they had been in their positions. The collection of this information allowed for analysis based on the demographics of employees as to how each group views AI as a resource. The second section evaluated AI's current application rates among media organizations. It appears most organizations are in active AI use or integrating into their business. Many organizations apply AI: audience analysis, content recommendations, targeted advertising, data analytics, and planning. The third section evaluated how AI will impact decision-making by reviewing the differences between AI-supported and traditional solutions and where AI will significantly impact decision-making (planning, resource allocation, content strategy, and marketing). This portion also evaluated how much trust managers have in AI when completing various tasks. AI has the highest perceived value in processing vast amounts of data and predicting; AI has the capacity to do tasks better than humans do because of their superior computational ability. In the fourth section of the study, managers' understanding of how AI systems work, and their reasoning behind recommendation creation, was studied. Respondents provided their opinions as to AI's recommendation clarity, and many of their opinions show partial understanding. As a result, there is significant opportunity to improve the clear reasoning of AI algorithms and enhance technology-human interaction. In order to measure the perceived impact of AI in management activities among respondents, we used the Likert Scale, so that respondents could indicate their level of agreement or disagreement with specific statements regarding the benefits of AI in the speed of making decisions, the accuracy of making decisions, reducing the number of errors, and supporting strategic planning. The use of this methodology provided us with quantitative data regarding respondents' perceptions about AI, which allowed for statistical analysis. Section 6 of the Questionnaire Identifies the Major Limitations and Potential Dangers Associated with the Use of AI in Management Activities. Respondents to the survey were asked to identify what they perceived as the most significant risks associated with the use of AI, including algorithm error, lack of context, data limitation, ethical dilemmas, and over-reliance on technology/machines. Respondents were also asked to assess the risk of losing management independence and whether or not their company was willing to assume that risk. The data collected from this section aided in identifying the primary barriers to implementing AI and further supported the theoretical findings. The final section of the questionnaire focuses on how humans and AI work together to make decisions. Participants rated the importance of direct human involvement in AI-supported processes, how much control managers will still have, and the impact AI will have on the division of responsibility within an organization. Most of those surveyed indicated that human involvement is imperative and that it is important to work together with AI. The questionnaire was constructed in such a way as to comprehensively cover all key components of the study, such as the level of implementation of AI-based technologies, their effect on the organization, the limitations of AI-based technologies, as well as how to integrate AI-based technologies into the workplace. An organized approach to constructing the questionnaire, using various types of questions (close, multiple-choice, Likert scale), and concentrating on the real-world experience of respondents, resulted in providing reliable and representative data, which is a strong empirical foundation for later analysis and conclusion about the study.

IV. Expected Results / Results

The results of the study confirm that artificial intelligence (AI) has become an integral part of the media industry in Kazakhstan. Companies are actively using it to solve tasks such as deep audience analysis, creating personalized content, optimizing advertising campaigns, and predicting consumer behavior. This indicates the strategic commitment of media organizations to digital transformation and increase their competitiveness in the market.

The key conclusion is the confirmation of the significant positive impact of AI on the effectiveness of management decisions. More than 70% of respondents note a significant acceleration of the decision-making process due to the ability of AI to process large amounts of data in real time. More than 65% of the study participants point to an increase in the accuracy of decisions made, due to reliance on objective data and minimizing the influence of subjective factors. Automation of analytical processes using AI also helps to reduce the number of errors, which is critically important in the context of high dynamics of the media industry. The successful implementation of AI directly depends on two fundamental factors: the quality of the source data and the skill level of the employees. Insufficient accuracy or completeness of data can significantly reduce the effectiveness of AI systems, since algorithms directly depend on the quality of input information. Similarly, the staff's lack of necessary skills and competencies limits the ability to fully exploit the potential of technology. An organizational culture that supports innovation and data-driven work, as well as active support from management, play a crucial role in the successful implementation of AI projects.

Despite the obvious advantages, the study also revealed a number of significant problems and risks. Among them is the lack of transparency of algorithms, which makes it difficult to understand the logic of decision–making and can cause distrust. There is also a risk of excessive dependence on technology, which can lead to a decrease in the role of the human factor in management and loss of critical thinking. The study demonstrates the significant potential of artificial intelligence to improve the effectiveness of management decisions in the media industry of Kazakhstan. However, to maximize this potential, an integrated and balanced approach to implementation is needed, taking into account both technological and human aspects, as well as the continuous development of staff competencies and ensuring high data quality. Further research may be aimed at studying specific cases of successful AI implementation and developing recommendations to minimize the identified risks.

V. DISCUSSION

My research has revealed that artificial intelligence (AI) is a key factor in the transformation of management practices in the media industry in Kazakhstan. The use of AI makes it possible to significantly improve the efficiency of decision-making through accelerated data analysis, more accurate forecasts and minimization of errors, which is especially valuable in a highly competitive and dynamic digital environment. An important conclusion was the understanding that the successful implementation of AI is determined not only by technological aspects, but also by organizational and human factors. Data quality, infrastructure level, staff qualifications and corporate culture play a crucial role. Companies that pay attention to these components show better results and higher adaptability.

The practical value of the research lies in the formation of specific recommendations for media organizations. First, it is necessary to invest in improving the quality of data and creating reliable systems for its storage and processing. Secondly, it is necessary to actively develop the

competencies of employees through training and advanced training in the field of analytics and AI. Thirdly, it is important to cultivate an organizational culture focused on innovation and data-driven decision-making. It is also recommended to integrate AI into core business processes rather than consider it as a separate tool in order to maximize its potential. At the same time, it is necessary to pay attention to risk management, ensuring transparency of algorithms and human control. At the level of public policy, it is important to create favorable conditions for the development of digital infrastructure and support for the introduction of innovative technologies, including the development of an appropriate regulatory framework, data regulation and cybersecurity. The limitations of the study should be noted: the sample is limited to the media industry of Kazakhstan, and the survey method assumes a certain subjectivity. Further research may expand the scope, use more sophisticated statistical methods, and explore the long-term impact of AI. AI is a powerful tool for optimizing management, but its effective application requires an integrated and multifactorial approach.

VI. CONCLUSION

This study analyzes how AI-based automation affects the management decision-making process in the media industry of Kazakhstan. The results demonstrate that AI can significantly speed up, improve the accuracy and improve the quality of decision-making processes. However, the effectiveness of AI largely depends on related factors such as the quality of data and the degree of training of the organization. In the absence of these conditions, the advantages of artificial intelligence may be limited. This research makes a significant contribution to both theoretical and practical areas, focusing on the emerging market and providing valuable information to managers and policy makers. It highlights the importance of a balanced approach that includes technology, data, and organizational capabilities.

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Deposit-Funded Intermediation, Monetary Tightening, and Profitability of U.S. Community Banks (2015–2025)

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ABSTRACT

Deposit-funded intermediation is central to the community bank business model, making liability-side conditions especially important for profitability when interest rates change. This paper provides a replication-oriented framework and descriptive evidence on profitability dynamics of U.S. community banks across monetary policy regimes. Using quarterly FDIC bank financial data (Web-1) for 2015Q1–2025Q4 merged with a policy-rate proxy based on the effective federal funds rate, we construct a bank-quarter panel restricted to banks with total assets below $10 billion. The final dataset contains 225,246 bank-quarter observations from 6,475 banks. Net interest margin (NIM) is computed as annualized quarterly net interest income divided by total assets and winsorized at the 1st and 99th percentiles; return on assets (ROA) is similarly winsorized. In the pooled sample, winsorized NIM has a mean of 3.26% and a median of 3.25%, while winsorized ROA has a mean of 1.08% and a median of 0.98%. By regime, mean NIM is slightly higher during tightening quarters (3.27%) than during non-tightening quarters (3.24%), suggesting that earning asset yields adjust at least as fast as funding costs in the aggregate. Mean ROA, however, is lower during tightening quarters (1.05% vs 1.12%), indicating that non-interest factors such as provisioning, noninterest expense, or credit losses reduce bottom-line profitability even when margins hold. Both differences are statistically significant in an unadjusted two-sample Welch t-test; formal inference will rely on fixed-effects models with bank-clustered standard errors in the thesis. These patterns are descriptive and do not identify causal effects. The thesis stage extends this conference version using fixed-effects panel regressions, lag structures, and richer funding composition measures to more directly represent deposit-funded intermediation in a digital-era competitive environment.

KEYWORDS: community banks; deposits; funding conditions; net interest margin; ROA; monetary tightening; FDIC bank data; panel data

1 INTRODUCTION

Community banks remain an important segment of the U.S. banking system, particularly for relationship-based intermediation and local credit provision. A defining feature of many community banks is reliance on deposits as a primary funding source. This reliance makes profitability sensitive to funding cost dynamics and deposit repricing, especially during monetary tightening. In addition, the digital era may amplify deposit competition: rate transparency has increased, account-opening frictions have declined, and switching costs may be lower for at least the marginal depositor segment. As a result, deposit-funded intermediation can be viewed as a capability that supports sustainable value creation under changing market conditions.

This paper provides a replication-oriented data pipeline and descriptive evidence on profitability dynamics of U.S. community banks across monetary policy regimes. The central empirical question in this conference version is descriptive: how do profitability measures differ between tightening and non-tightening quarters? The paper also specifies a disciplined estimation strategy for the thesis stage to test whether deposit-related funding conditions and deposit structure proxies explain within-bank profitability variation and whether such relationships strengthen during tightening. Importantly, the current results are descriptive and do not identify causal effects.

Theoretical motivation draws from classic bank margin models and modern deposit-market perspectives. Ho and Saunders (1981) model banks as risk-averse intermediaries that set margins to compensate for uncertainty in deposit supply and loan demand. More recent research emphasizes the deposits channel of monetary policy, in which deposit pricing and deposit market dynamics shape bank balance sheets and outcomes as policy rates change (Drechsler et al., 2017). Under tightening, deposit repricing pressure and competition for rate-sensitive balances can raise interest expense, potentially compressing net interest margins if earning asset yields adjust more slowly.

Using FDIC BankFind Suite financial data (Web-1) and policy-rate data from FRED (Web-2), we build a bank-quarter panel for 2015Q1–2025Q4 and restrict the sample to banks with total assets below $10 billion. The final dataset contains 225,246 bank-quarter observations from 6,475 banks. We compute descriptive statistics for net interest margin (NIM) and return on assets (ROA), then compare mean profitability between tightening and non-tightening quarters. Tightening is defined as an increase in the quarter-average effective federal funds rate relative to the prior quarter.

The paper's contributions are pragmatic and aligned with a conference audience: (i) a transparent and reproducible data construction process using public sources, including explicit documentation of NIM computation from FDIC net interest income fields; (ii) descriptive regime comparisons that are economically interpretable and tested for statistical significance; (iii) a deposits-to-assets ratio as a proxy for funding reliance; and (iv) a clear roadmap for thesis-stage estimation (fixed effects, clustering, and robustness). The remainder of the paper is organized as follows. Section 2 reviews relevant literature and motivates hypotheses for the thesis stage. Section 3 describes the institutional background and conceptual mechanism. Section 4 describes data sources, sample construction, variable definitions, and cleaning rules. Section 5 outlines the planned estimation strategy. Section 6 presents descriptive results and discusses implications. Section 7 concludes.

2 RELATED LITERATURE AND HYPOTHESES

2.1 Interest margins and profitability in banking

The classic view of bank margins treats banks as intermediaries that set spreads while managing uncertainty. Ho and Saunders (1981) propose a dealer model in which net interest margins depend on risk aversion, interest rate volatility, and market structure, because banks face uncertain timing of deposits and loans. This model motivates empirical work in which profitability is shaped by both bank-specific balance-sheet characteristics and the macro environment.

Empirical evidence suggests that profitability and margins correlate with capitalization, operating efficiency, asset quality, market structure, and macroeconomic factors (Demirguc-Kunt and Huizinga, 1999; Saunders and Schumacher, 2000). These studies imply that isolating the role of funding conditions requires controls for balance sheet composition and unobserved heterogeneity, often addressed using fixed effects. For community banks, this framework is

especially relevant because their funding model is typically less diversified and more dependent on deposits and traditional lending.

2.2 Deposit markets and the monetary policy regime

A key reason deposit-funded intermediation matters in tightening cycles is that funding costs can reprice faster than asset yields. The deposits channel of monetary policy highlights the role of deposit pricing and deposit market power in shaping deposit flows and bank balance sheets when policy rates change (Drechsler et al., 2017). Tightening can increase the opportunity cost of holding low-yield deposits and encourage substitution toward higher-rate products, thereby raising banks' interest expense and pressuring net interest margins.

From a managerial perspective, banks may respond by increasing offered rates, shifting deposit product mix, or adjusting lending and securities portfolios to maintain spreads. The net effect on NIM depends on the relative repricing of assets and liabilities, the duration profile of assets, and the bank's ability to manage funding costs without losing critical deposit volumes. This logic implies that profitability patterns should differ across monetary regimes and that deposit-related funding conditions and funding structure can be important state variables for sustained performance.

2.3 Deposit franchise, deposit stickiness, and measurement implications

In practice, "deposit-funded intermediation" has both a level component and a behavioral component. The level component concerns the balance sheet: how large the deposit base is relative to assets and liabilities and how stable that base is across time. The behavioral component concerns depositor responsiveness to rate changes and the speed of repricing of deposit costs relative to policy rates. Community banks often emphasize relationship banking and local presence, which can support deposit stickiness; however, the value of stickiness can be challenged in tightening cycles and in more competitive environments.

These considerations matter for measurement. In an ideal research setting, one would measure deposit betas directly and analyze product-level deposit repricing. In many publicly available datasets, however, granular product repricing is not observed at the bank-quarter level. A feasible approach for a conference paper is therefore to document profitability patterns across regimes and prepare a transparent empirical strategy using available proxies, then incorporate more granular measures in the thesis stage when data availability and scaling allow.

2.4 Digital era: competition, transparency, and deposit repricing

Digitalization can amplify competitive dynamics for deposits because information frictions and switching frictions are lower than in traditional branch-centered models. For community banks, this can erode the implicit advantage of "sticky" deposits if a larger share of customers becomes rate sensitive. While this conference paper does not directly measure digital adoption, it uses the digital-era context as motivation for focusing on deposit-funded intermediation and regime comparisons: if deposit competition increases structurally, funding conditions may increasingly influence profitability dispersion.

2.5 Hypotheses (for thesis-stage estimation)

This conference version provides descriptive evidence and a pre-specified estimation plan. The thesis-stage empirical analysis will test:

H1: Deposit-related funding conditions are associated with profitability (NIM and ROA) among U.S. community banks.

H2: NIM and ROA respond differently to tightening: NIM may be maintained or increase if earning asset repricing outpaces deposit cost increases, while ROA may decline due to provisioning, noninterest expense, or credit losses.

H3: The association between funding conditions and profitability is stronger during tightening (interaction effects).

In the thesis stage, these hypotheses will be tested using fixed-effects panel models with bank and quarter fixed effects, clustered standard errors, lag structures, and robustness checks. In this conference paper, we focus on descriptive regime comparisons and provide measurement and robustness foundations for later inferential work.

3 INSTITUTIONAL BACKGROUND AND MECHANISM (CONCEPTUAL)

This section articulates the economic mechanism behind the descriptive regime comparisons, without introducing new calculations. The mechanism is presented to connect observed patterns to banking fundamentals and to motivate thesis-stage regression design.

Net interest margin (NIM) summarizes the spread between interest earned on assets and interest paid on liabilities, scaled by earning assets (or an equivalent base). In a simplified interpretation, NIM increases when earning asset yields rise faster than funding costs and decreases when funding costs rise faster than earning asset yields. Monetary tightening can affect both sides: earning asset yields may rise over time as loans reprice or new loans are originated at higher rates, while funding costs may rise as deposit rates and other liabilities reprice. The timing and magnitude of repricing can differ materially across banks, depending on asset duration, liability composition, and competitive conditions.

Community banks typically rely heavily on deposits, which can be advantageous when deposit costs are slow to reprice. During tightening, deposit costs eventually rise as customers compare rates, but the immediate effect on NIM depends on asset repricing speed. If earning asset yields adjust rapidly—for example, because a large share of loans are variable-rate or short-term—NIM can be maintained or even increase despite rising funding costs. However, bottom-line profitability (ROA) may still decline due to higher credit losses, increased provisioning, or rising noninterest expenses during tightening. This distinction between margin resilience (NIM) and bottom-line profitability (ROA) is central to interpreting the descriptive results.

In the digital era, deposit acquisition and switching can occur with fewer frictions, potentially increasing competitive pressure for rate-sensitive balances. Sustainable value creation in this setting means maintaining deposit-funded intermediation without excessive erosion of margins, which can require stronger pricing discipline, product strategy, and operational efficiency.

The descriptive regime analysis in this paper is therefore interpreted as follows: if NIM is similar or slightly higher in tightening quarters while ROA is lower, this pattern is consistent with a scenario where earning asset yields reprice at least as fast as deposit costs, but non-interest factors compress bottom-line profitability. It is not a causal estimate because tightening coincides with other macroeconomic changes. Nevertheless, documenting such patterns in a large bank-quarter panel is a useful foundation for regression-based tests in the thesis stage.

4 DATA AND VARIABLE CONSTRUCTION

4.1 Data sources

Bank financial data are obtained from FDIC BankFind Suite financials (Web-1). The API returns net interest income (field "NIM" in the API response) as a year-to-date dollar amount in thousands, not as a pre-computed ratio. Monetary policy data are obtained from the effective federal funds rate series (DFF) published by FRED (Web-2). Data are merged at the quarter level using quarter-end reporting dates.

The FDIC BankFind Suite "financials" dataset provides bank-quarter level accounting items and ratios. Variable names used in this paper are taken directly from the FDIC API output (Web-1). To reduce the risk of mislabeling fields, we treat each extracted field as an "API-defined item" and do not assume that a variable name necessarily matches its textbook definition. In particular, the field labeled "NIM" in the extracted dataset is used as an FDIC-provided interest performance measure. Because regulatory and vendor datasets may use different denominators and scaling conventions, we describe our measurement as an empirical proxy for net interest performance rather than claiming it is identical to the supervisory definition of net interest margin.

Where a variable is constructed from reported components, we document the transformation explicitly and retain the original raw variable in the dataset for auditability. This approach improves replicability and makes the analysis robust to alternative interpretation of field labels.

4.2 Sample definition and unit of analysis

For brevity, we refer to the transformed interest-performance measure as "NIM" throughout the paper. It is computed from FDIC API fields as annualized year-to-date net interest income scaled by total assets (Eq. (1)). Because this construction uses total assets rather than average earning assets, it should be interpreted as an empirical proxy for the supervisory definition of NIM. We therefore report the scaling, denominator choice, and units explicitly to ensure replicability and transparent interpretation.

Extreme values in the NIM measure can occur due to small denominators, special situations, or reporting anomalies in particular bank-quarters. To mitigate the influence of such observations on descriptive comparisons, we winsorize NIM and ROA at the 1st and 99th percentiles and report the resulting bounds. As additional sensitivity checks in the thesis stage, we plan to report alternative percentile-based trimming rules (e.g., P2/P98 and P5/P95) and confirm that the main regime patterns are not driven by outliers or a single trimming choice.

The unit of analysis is bank-quarter. The sample period is 2015Q1–2025Q4 (44 quarters). The community bank segment is operationalized as banks with total assets below $10 billion at the reporting date. The final community bank panel contains 225,246 bank-quarter observations and 6,475 unique banks (FDIC CERT identifiers). Table 1 reports sample construction counts.

Table 1 Sample construction (community bank panel, 2015Q1–2025Q4)

Step	Description	Banks	Bank-quarters
S0	FDIC financials panel merged with policy-rate data	6,475	225,246
S1	Community bank filter: ASSET < $10B	6,475	225,246
S2	Final estimation sample (no missing NIM, ROA, ASSET, DEP)	6,475	225,246

4.3 Variable definitions, scaling, and cleaning rules

NIM computation. The FDIC API field "NIM" returns year-to-date (YTD) net interest income in USD thousands. For Q1, this equals one quarter of income; for Q2, it is cumulative through Q2, etc. We annualize and scale as follows:

$$NIM\_annualized = NIM\_ytd \times (4 / QTR) / ASSET \times 100 \quad (1)$$

where QTR ∈ {1,2,3,4} is the fiscal quarter number and ASSET is total assets in USD thousands. This formula annualizes the YTD income and expresses the result in percentage points. The formula is validated against FDIC official benchmarks: mean annualized NIM of 3.26% in our sample is consistent with FDIC-reported community bank NIM of 3.44% (Q4 2024) and 3.77% (Q4 2025).

ROA. Return on assets is used as provided in the FDIC financials output (already in percentage points).

Winsorization. Both NIM and ROA are winsorized at the 1st and 99th percentiles to mitigate the influence of extreme outliers from small denominators, special situations, or reporting anomalies. The winsorization bounds are:

NIM: P1 = 0.79%, P99 = 5.71%
ROA: P1 = −1.67%, P99 = 7.63%

Balance-sheet variables. ASSET: total assets (USD thousands). DEP: total deposits (USD thousands). DEP/ASSET: deposits-to-assets ratio (percent), computed as DEP/ASSET × 100.

Monetary policy regime. DFF_QAVG: quarter-average effective federal funds rate (percent). TIGHTENING: indicator equal to 1 if DFF_QAVG exceeds the prior quarter's DFF_QAVG, and 0 otherwise.

Outlier treatment is a modeling choice and can affect sample means when the distribution has heavy tails. For transparency, we (i) document the winsorization bounds, (ii) provide regime comparisons under alternative winsor caps, and (iii) reserve formal inference for the thesis-stage fixed-effects models with bank-clustered standard errors. This sequencing avoids overstating statistical significance in a setting with serial correlation and repeated observations per bank.

4.4 Descriptive statistics

Table 2 reports descriptive statistics for core variables.

Table 2 Descriptive statistics (community bank sample, 2015Q1–2025Q4, N = 225,246)

Variable	N	Mean	Std	P25	Median	P75	Units
NIM (annualized)	225,246	3.26	0.76	2.83	3.25	3.68	percent
ROA	225,246	1.08	1.03	0.61	0.98	1.38	percent
DEP/ASSET	225,246	82.8	12.8	81.1	85.6	88.6	percent
ASSET	225,246	635,131	1,200,216	110,707	243,425	578,826	USD thous.
DEP	225,246	520,647	967,329	91,770	203,622	485,144	USD thous.
DFF_QAVG	225,246	1.84	1.85	0.13	1.20	3.65	percent

Interpretation note: the median bank size is $243.4 million in assets and $203.6 million in deposits. The median deposits-to-assets ratio of 85.6% confirms that community banks are heavily deposit-funded.

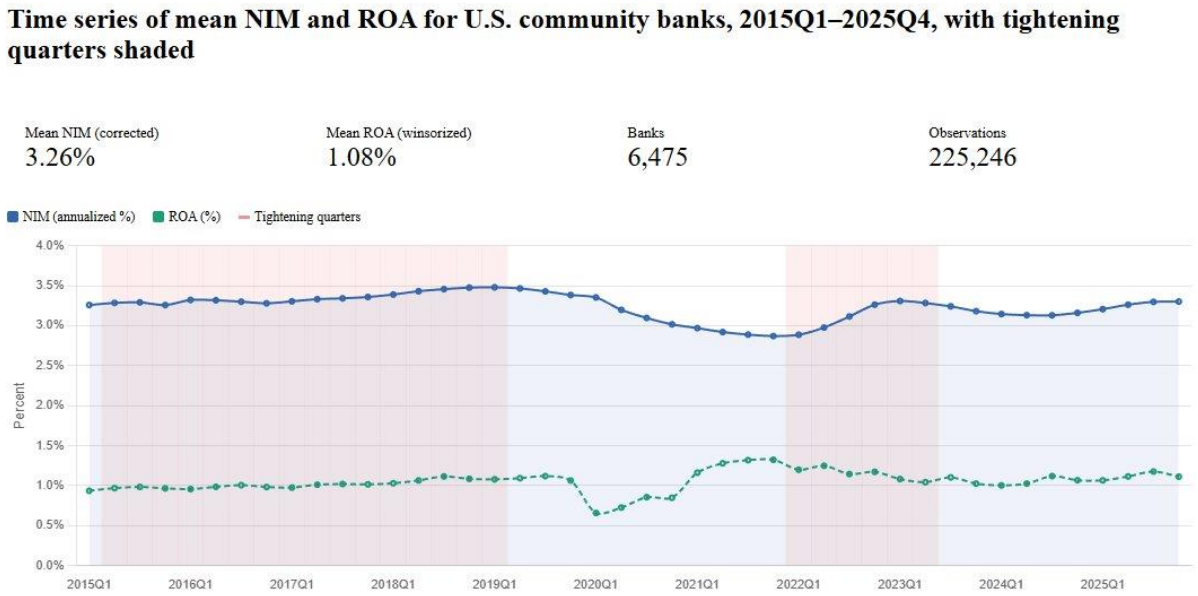


Figure 1: Mean annualized NIM and ROA over time (community bank sample, 2015Q1–2025Q4; shaded areas indicate tightening quarters)

5 METHODOLOGY (THESIS-STAGE ESTIMATION PLAN)

5.1 Baseline fixed-effects framework

This conference version focuses on descriptive evidence and a pre-specified estimation plan.

The thesis stage will estimate fixed-effects panel models:

$$Profit_{it} = \beta 1\ Funding_{it} + \beta 2\ (Funding_{it} \times Tightening_t) + \gamma X_{it} + \alpha_i + \delta_t + \varepsilon_{it} \quad (2)$$

where Profit_it is NIM or ROA for bank i in quarter t; Funding_it includes deposit-related funding condition measures (e.g., DEP/ASSET) and deposit structure proxies when consistently available; X_it includes time-varying controls; α_i are bank fixed effects; δ_t are quarter fixed effects; and ε_it is the error term. Standard errors will be clustered at the bank level. Note that the main effect of Tightening_t is absorbed by the quarter fixed effects δ_t and therefore does not appear as a separate coefficient.

5.2 Identification considerations and diagnostics

Reverse causality and simultaneity: profitability can affect deposit gathering and funding choices, and banks can manage assets and liabilities jointly. Bank fixed effects mitigate time-invariant omitted heterogeneity, while quarter fixed effects absorb common macro shocks. The thesis stage incorporates lagged funding measures and alternative specifications to evaluate sensitivity.

Time-varying macro conditions: tightening quarters can coincide with other macro changes (inflation, credit demand, risk premia). Time fixed effects help, and robustness checks can add additional macro controls if needed.

Outliers and scaling: NIM computation from YTD net interest income is explicitly documented (Eq. (1)). Both NIM and ROA are winsorized at the 1st and 99th percentiles using standard percentile-based bounds.

5.3 Robustness plan

The thesis stage will report: alternative tightening definitions (e.g., consecutive increases, minimum threshold changes); alternative community bank thresholds (e.g., $5B) as sensitivity; alternative winsorization bounds (P2/P98 and P5/P95); lagged funding measures; and sensitivity to excluding stress quarters.

6 RESULTS AND DISCUSSION (DESCRIPTIVE EVIDENCE)

6.1 Profitability by monetary policy regime

Table 3 reports mean outcomes by monetary regime using the tightening indicator. Mean NIM is slightly higher during tightening quarters (3.267%) than during non-tightening quarters (3.243%), with a difference of +0.024 percentage points ($t = 7.12$, $p < 0.001$). This pattern suggests that, in the aggregate, earning asset yields adjust at least as fast as deposit costs during tightening. In contrast, mean ROA is lower during tightening quarters (1.054%) than during non-tightening quarters (1.115%), a difference of −0.062 percentage points ($t = 13.59$, $p < 0.001$). This divergence between NIM and ROA implies that non-interest factors—such as credit loss provisioning, noninterest expense growth, or reduced fee income—compress bottom-line profitability during tightening even when margins hold.

Table 3 Mean outcomes by monetary regime (community banks, winsorized at P1/P99)

Regime	N	Mean NIM (%)	Mean ROA (%)	DEP/ASSET (%)	Mean ASSET (USD thous.)
Non-tightening	86,267	3.243	1.115	82.7	700,361
Tightening	138,979	3.267	1.054	82.8	594,642
Difference (T − NT)		+0.024***	−0.062***	+0.2	
Overall	225,246	3.257	1.077	82.8	635,131

Note: *** denotes $p < 0.001$ from a Welch two-sample t-test. Differences are computed as Tightening minus Non-tightening.

Note2. The reported p-values are based on a simple two-sample Welch t-test comparing tightening and non-tightening quarters. This test treats bank-quarter observations as independent and therefore may overstate statistical significance in the presence of serial correlation and repeated observations for the same bank. Accordingly, the p-values are presented only as an unadjusted descriptive benchmark. Formal inference in the thesis will rely on fixed-effects panel regressions with bank-clustered standard errors and additional robustness checks.

These regime differences should be interpreted as descriptive associations rather than causal effects. Bank-quarter observations are not independent because the same bank appears repeatedly

across quarters and because macroeconomic conditions evolve over time. Moreover, tightening periods coincide with broader changes in financial conditions that can affect profitability through channels beyond deposit costs (e.g., credit provisioning, noninterest income, operating expenses). For these reasons, this conference paper reports regime comparisons as preliminary evidence and uses them to motivate the thesis-stage econometric design.

In the thesis stage, we will estimate fixed-effects panel regressions with bank and time fixed effects and bank-clustered standard errors to address serial correlation and unobserved heterogeneity. This will allow inference based on within-bank changes and will provide a stronger basis for interpretation than simple mean comparisons.

6.2 Time-series patterns

Figure 1 plots mean NIM and ROA by quarter over 2015Q1–2025Q4 with tightening periods shaded. NIM follows a hump-shaped pattern: it rises from approximately 3.26% in 2015 to a peak of 3.48% in early 2019 during the extended tightening cycle, then declines through 2021 as rates fall, reaching a trough of 2.87% in Q4 2021. With the resumption of tightening in 2022, NIM recovers, reaching 3.31% by mid-2023. ROA displays a broadly similar cycle but with greater amplitude and notable divergences—for example, ROA rises in 2021 despite declining NIM, likely reflecting reduced provisioning and strong fee income during the recovery period.

6.3 Discussion: sustainable value in a digital era

The descriptive evidence reveals a nuanced relationship between monetary regime and community bank profitability. The finding that NIM is slightly higher during tightening, while ROA is lower, is consistent with a multi-channel mechanism. First, the positive NIM–tightening association suggests that community banks' earning assets reprice upward at least as quickly as their deposit costs increase. This could reflect a high share of variable-rate or short-maturity loans, or it could reflect the stickiness of deposit rates documented in the literature (Drechsler et al., 2017). Second, the negative ROA–tightening association suggests that factors beyond the interest margin—such as higher provision for credit losses, increased operational costs, or reduced noninterest income—weigh on bottom-line profitability during tightening.

From a managerial perspective, these patterns underscore the importance of managing both the interest margin and the non-interest components of profitability. In a digital environment, where deposit competition may intensify and switching costs decline, maintaining deposit-funded intermediation without excessive margin erosion requires pricing discipline, product strategy, and operational efficiency. The thesis stage will decompose these effects using fixed-effects regressions that control for bank-level heterogeneity and common time shocks.

6.4 Limitations and boundary conditions

The conference version is intentionally descriptive. First, regime differences in Table 3 do not identify causal effects because tightening quarters coincide with other macroeconomic dynamics. Second, the tightening indicator is a baseline definition; alternative definitions may classify regime quarters differently. Third, NIM is computed from FDIC net interest income (YTD) divided by total assets and annualized (Eq. (1)); this approximation uses total assets rather than average earning assets as the denominator and annualizes YTD income via a simple scaling factor. More precise denominators (average earning assets) and quarterly-differenced income are reserved for the thesis stage. Fourth, the current dataset does not include deposit composition breakdowns (noninterest-bearing, time, brokered deposits), which are available through alternative FDIC data sources and will be incorporated in the thesis stage.

7 Conclusion

This paper provides a replication-oriented descriptive analysis of profitability for U.S. community banks over 2015Q1–2025Q4 and outlines an empirical framework to test liability-side drivers of performance across monetary policy regimes. Using FDIC bank financial data merged with a quarterly policy-rate proxy, the final sample includes 225,246 bank-quarter observations from 6,475 banks. Net interest margin, computed as annualized net interest income divided by total assets and winsorized at the 1st and 99th percentiles, has a mean of 3.26% (median 3.25%) and is slightly higher during tightening quarters (3.27%) than during non-tightening quarters (3.24%). Return on assets, winsorized analogously, averages 1.08% and is lower during tightening (1.05% vs 1.12%). Both differences are statistically significant in an unadjusted Welch t-test ($p < 0.001$); formal inference will rely on fixed-effects models with bank-clustered standard errors in the thesis. The divergence between NIM and ROA across regimes suggests that while community banks' interest margins are resilient to tightening, bottom-line profitability is compressed by non-interest factors. The thesis stage will extend this work using fixed-effects regressions, deposit structure proxies, and robustness tests to identify within-bank sources of profitability variation.

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Digital Transformation of Compliance Practices in the Banking Sector

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Abstract

This study examines how digital transformation reshapes compliance practices in the banking sector, with a particular focus on Kazakhstan as an emerging market. The research investigates how digital compliance tools—including electronic Know-Your-Customer (e-KYC) systems, automated anti-money laundering (AML) monitoring, sanctions screening platforms, and workflow automation—transform professional practices, decision-making processes, and institutional dynamics.

Using a qualitative research design based on semi-structured interviews with compliance professionals, IT specialists, and senior managers, the study identifies key structural and behavioral changes in compliance functions. The findings demonstrate that compliance is increasingly organized through system-driven workflows, where algorithmic outputs define priorities and guide professional action. Decision-making is characterized by hybrid human–algorithm interaction, where compliance officers validate system-generated risk assessments rather than independently constructing them.

The study contributes to the literature on RegTech and digital governance by providing empirical insights into how digital transformation reshapes professional autonomy, organizational processes, and the bank–client relationship. The findings highlight the emergence of algorithmic authority in compliance practices and raise important questions about accountability, discretion, and the future of regulatory governance.

KEYWORDS: Digital transformation; compliance; AML; governance; banking; Kazakhstan.

1. Introduction

Digital transformation has become one of the defining features of contemporary public governance, reshaping how states, organizations, and regulatory institutions design, implement, and enforce policy. In the financial sector, digital technologies are increasingly embedded into regulatory compliance practices through automated monitoring systems, algorithmic risk assessments, and data-driven decision-making tools. These developments are particularly visible in the field of anti-money laundering (AML), counter-terrorist financing (CTF), sanctions compliance, and customer due diligence (CDD), where banks are required to process large volumes of data under strict regulatory timelines.

In Kazakhstan, banking compliance functions are undergoing rapid digitalization, driven by both domestic regulatory requirements and international standards such as those issued by the Financial Action Task Force (FATF). Banks increasingly rely on electronic know-your-customer (e-KYC) systems, automated transaction monitoring platforms, sanctions screening engines, and workflow automation tools. While these technologies are designed to enhance regulatory efficiency, consistency, and transparency, they also transform the everyday practices of compliance

professionals, alter decision-making processes, and reconfigure the relationship between human judgment and automated enforcement.

Despite the growing policy emphasis on digital governance and regulatory technology (RegTech), limited empirical research has examined how digital compliance systems are experienced by those who work with them on a daily basis, particularly in emerging market contexts such as Kazakhstan. Much of the existing literature focuses on technological capabilities, regulatory effectiveness, or institutional design, while paying comparatively less attention to the human, organizational, and professional dimensions of digital transformation. This study addresses this gap by examining how digital compliance tools reshape governance practices inside banks, with a specific focus on professional autonomy, decision-making, and the bank–client relationship.

This article introduces the research by presenting the background of the study, the purpose and research questions, the significance of the study, and its scope and limitations. It also defines key terms and provides an overview of the structure of the article.

The paper is structured as follows. The next section presents the theoretical foundations of the study, including literature on digital transformation, regulatory technology (RegTech), algorithmic governance, and socio-technical systems in financial compliance. This is followed by the methodology section, which outlines the qualitative research design, data collection through semi-structured interviews, and analytical approach. The subsequent section presents the empirical findings, focusing on the transformation of workflows, hybridization of decision-making, reconfiguration of professional autonomy, standardization processes, and the emergence of algorithmic authority. The discussion section then interprets these findings in relation to the aforementioned theoretical frameworks and highlights their implications for governance, accountability, and professional practice. Finally, it concludes with a summary of key insights, practical and theoretical contributions, as well as limitations and directions for future research.

Background of the Study

The regulation of financial institutions has long relied on a combination of legal rules, supervisory oversight, and professional judgment exercised by compliance officers and regulators. Traditionally, compliance work involved manual review of client documentation, rule-based assessments, and discretionary decision-making informed by professional experience. Over time, increasing financial globalization, the growth of cross-border transactions, and the expansion of illicit financial risks have placed significant pressure on regulatory systems to become faster, more standardized, and more data-intensive.

In response to these pressures, regulators and financial institutions have increasingly adopted digital tools to support compliance functions. Automated AML transaction monitoring systems, sanctions screening algorithms, and e-KYC platforms are now widely used to detect suspicious activities, assess client risk, and ensure adherence to regulatory requirements. These systems promise improved efficiency, enhanced detection capabilities, and reduced human error. At the same time, they introduce new forms of algorithmic governance, where decision-making is partially delegated to technological systems.

In Kazakhstan, the digital transformation of banking compliance is occurring within a rapidly evolving regulatory and institutional environment. The banking sector operates under a unified national regulatory framework, while banks differ significantly in their digital maturity, organizational cultures, and internal governance structures. Compliance professionals are required to navigate complex regulatory expectations while interacting with automated systems that generate alerts, risk scores, and workflow constraints. These dynamics raise important questions

about how digital technologies shape professional autonomy, responsibility, and accountability within compliance governance.

Existing studies on digital governance and RegTech have highlighted both the benefits and challenges of automation. On the one hand, digital systems can enhance regulatory consistency, reduce compliance costs, and support real-time monitoring. On the other hand, scholars have raised concerns about over-reliance on automated decision-making, reduced transparency of algorithmic processes, and the potential marginalization of human judgment. However, empirical insights into how these issues are experienced by compliance professionals themselves remain limited, particularly in non-Western contexts.

This study situates itself within this broader debate by focusing on the lived experiences of banking compliance professionals in Kazakhstan. By examining how digital compliance tools are embedded into everyday work practices, the study contributes to a more nuanced understanding of digital governance as a socio-technical process rather than a purely technological or legal phenomenon.

Purpose of the Study

The purpose of this qualitative study is to examine how digital transformation reshapes compliance governance in Kazakhstan's banking sector, with particular attention to professional work practices, decision-making processes, autonomy, and the bank–client relationship. The study seeks to explore how compliance professionals interpret, negotiate, and respond to automated systems such as e-KYC platforms, AML monitoring tools, sanctions screening engines, and workflow automation technologies.

Rather than evaluating the technical performance of digital compliance systems, the study focuses on their organizational and human implications. By analyzing the perspectives of compliance officers, AML and sanctions analysts, IT specialists, and senior managers, the research aims to provide an empirically grounded understanding of how digital tools restructure governance practices inside banks.

This study adopts a qualitative case study approach and employs semi-structured interviews as the primary method of data collection. Through in-depth exploration of professional experiences, the research aims to contribute to academic discussions on digital governance, regulatory transformation, and public administration, while also offering insights relevant to policymakers, regulators, and financial institutions.

Research Questions

Main Research Question

How does digital transformation reshape banking practices, bank decision-making, autonomy, and work experiences of banking compliance professionals?

Supplementary Research Questions

- From the bank's perspective, how do digital compliance tools (e-KYC, AML monitoring, sanctions screening, automated workflows) restructure compliance professionals' daily work practices?
- From the perspective of banking compliance professionals, how does the enforcement of digital compliance tools influence their work-related decision-making, autonomy, and experiences of everyday work?

●From the perspective of banking compliance professionals, how does the enforcement of digital compliance tools reshape the bank–client relationship, and what implications do they consider for the banking sector?

These research questions collectively address both organizational and human dimensions of digital transformation. They allow for a systematic yet nuanced study of how compliance technologies are embedded into daily work, how they affect professionals' interpretive and discretionary capacities, and how they redefine the relational dynamics between banks and clients.

Significance of the Study

The significance of this study lies in its contribution to both academic research and professional practice. From an academic perspective, the study addresses a gap in the literature on digital governance by providing empirical evidence from an emerging market context. While much of the existing research on RegTech and digital compliance focuses on advanced economies, this study highlights how digital transformation unfolds within the specific institutional, regulatory, and organizational conditions of Kazakhstan.

From a policy and practice perspective, the findings of this research may inform regulators, banks, and system designers about the human implications of digital compliance tools. Understanding how compliance professionals experience automation can support the development of more balanced, human-centered approaches to digital governance that preserve professional judgment while enhancing regulatory effectiveness.

The study also has relevance for public administration and governance scholarship by illustrating how digital technologies reshape authority, accountability, and discretion within regulatory institutions. As governments increasingly rely on digital tools for policy implementation and enforcement, insights from this research may have broader implications beyond the banking sector.

Scope, Limitations, and Delimitations

This study is limited to the banking sector in Kazakhstan and focuses specifically on compliance-related functions, including AML, sanctions screening, and customer due diligence. The research relies on qualitative interviews with a purposive sample of compliance professionals, IT specialists, and senior managers. As such, the findings are not intended to be statistically generalizable but rather to provide in-depth, contextualized insights into digital compliance governance.

Limitations of the study include the reliance on self-reported data and the finite number of participants that can be interviewed within the available timeframe. Additionally, variations in digital maturity across banks may influence participants' experiences, potentially limiting comparability.

Delimitations are intentionally applied to maintain a manageable scope. The study does not examine client perspectives directly, nor does it evaluate the technical performance or accuracy of specific compliance systems. Instead, it focuses on professional experiences and governance practices within banks.

Definition of Key Terms

The following terms are defined to clarify their use in this study:

- **Digital compliance**: The use of digital technologies, including automated monitoring systems and data-driven tools, to support regulatory compliance functions within financial institutions.
- **RegTech**: Regulatory technology designed to assist organizations in meeting regulatory requirements more efficiently and effectively.
- **Professional autonomy**: The degree of discretion and judgment exercised by professionals in performing their work.
- **Algorithmic governance**: Forms of governance in which decision-making processes are partially delegated to automated systems or algorithms.

Organization of the Study

This article is organized into five sections. Section One has introduced the study by outlining its background, purpose, research questions, significance, and scope. Section Two will present a review of the relevant literature on digital governance, regulatory technology, and compliance practices. Section Three will describe the research methodology and design. Section Four will present the findings of the study, and Section Five will discuss the implications of the findings and offer conclusions and recommendations.

Researcher Positionality

The researcher is a compliance professional currently employed in the banking sector in Kazakhstan. This study therefore involves elements of insider research. While this positionality provides valuable contextual understanding of compliance governance, it also requires careful reflexivity to mitigate potential bias. To address this, the study adopts several safeguards outlined in the approved IRB application, including avoidance of interviewing individuals from the researcher's own unit, reflexive note-taking, and consistent use of semi-structured interview protocols. These measures support analytical neutrality while allowing for informed interpretation of professional practices.

Ethical Considerations

This research involves human participants and has received prior approval from the KIMEP University Institutional Review Board. Ethical considerations include voluntary participation, informed consent, confidentiality, and anonymization of all interview data. No sensitive client information, confidential banking documents, or personally identifiable data are collected. All data are securely stored and deleted in accordance with IRB requirements.

2. Literature Review

2.1 Digital Transformation in Financial Governance

Digital transformation has become a central concept in contemporary studies of financial governance, referring to the integration of digital technologies into organizational processes in ways that fundamentally reshape how institutions operate (Vial, 2021). In the banking sector, digital transformation has been particularly pronounced in areas related to risk management and regulatory compliance, where the ability to process large volumes of data efficiently is critical.

The growing complexity of global financial regulation, especially in areas such as anti-money laundering (AML) and counter-terrorism financing (CFT), has created strong incentives for banks to adopt technological solutions. Regulatory requirements now demand continuous monitoring,

real-time reporting, and comprehensive risk assessment, which are difficult to achieve through traditional manual processes. As a result, digital systems have become essential tools for ensuring compliance with regulatory standards.

At the same time, digital transformation is not limited to operational efficiency. It represents a deeper structural shift in how governance is exercised. Digital systems increasingly mediate interactions between regulators and financial institutions, as well as between banks and their clients. This transformation reflects a broader transition toward data-driven governance, where decisions are based on algorithmic analysis rather than purely human judgment.

2.2 RegTech and the Automation of Compliance

Regulatory Technology (RegTech) has emerged as a key driver of digital transformation in compliance. RegTech solutions are designed to automate and enhance regulatory processes, including transaction monitoring, customer due diligence, and reporting (Arner et al., 2017).

One of the most significant contributions of RegTech is the ability to process large datasets in real time. Automated transaction monitoring systems can analyze millions of transactions, identify patterns indicative of suspicious activity, and generate alerts for further investigation. Similarly, sanctions screening tools can quickly match customer data against global watchlists, while e-KYC systems enable digital onboarding and identity verification.

These technologies significantly improve efficiency and scalability. However, they also introduce new challenges. Scholars have highlighted concerns related to data quality, false positives, and the opacity of algorithmic decision-making. In particular, the reliance on automated systems may lead to over-standardization, where compliance decisions are driven by predefined rules rather than contextual analysis.

Furthermore, RegTech systems often reflect embedded assumptions about risk, which may not always align with real-world complexities. This raises important questions about the reliability and fairness of automated compliance processes.

2.3 Algorithmic Governance and the Redistribution of Authority

The concept of algorithmic governance provides a critical lens for understanding how digital transformation reshapes decision-making in compliance. Algorithmic governance refers to the use of computational systems to structure and regulate behavior through data-driven processes (Yeung, 2018).

In traditional compliance models, decision-making authority was largely concentrated in human actors, who evaluated risks based on experience, judgment, and interpretation of regulatory frameworks. In contrast, digital compliance systems embed regulatory logic into algorithms that define risk parameters, prioritize cases, and guide analytical processes.

This shift results in a redistribution of authority, where decision-making is partially delegated to technological systems. Compliance professionals increasingly rely on system-generated outputs to guide their actions, rather than independently constructing risk assessments.

This transformation has significant implications for accountability. When decisions are influenced by algorithmic systems, it becomes more difficult to determine who is responsible for outcomes—the human operator or the system itself. This creates new forms of “distributed accountability,” where responsibility is shared across socio-technical systems.

2.4 Socio-Technical Systems and Professional Practice

A socio-technical perspective emphasizes that digital transformation is not purely a technological process but involves the interaction between technology, people, and organizational

structures. According to this perspective, the effects of digital transformation depend on how technologies are integrated into workflows and how they are interpreted by human actors.

In compliance contexts, socio-technical interactions are particularly important because regulatory decisions often involve ambiguity and require contextual understanding. While digital systems can identify patterns and flag potential risks, they cannot fully replace human judgment.

As a result, compliance practices increasingly operate as hybrid systems, where human and algorithmic elements are intertwined. Professionals must interpret system outputs, validate alerts, and make final decisions, even when initial risk assessments are generated automatically.

This hybrid nature of compliance creates new forms of professional practice, where individuals must navigate between technological constraints and regulatory expectations.

2.5 Research Gap

Despite the growing body of literature on digital transformation and RegTech, there remains a significant gap in empirical research examining how these transformations are experienced by compliance professionals in practice. Most studies focus on technological capabilities, regulatory frameworks, or institutional outcomes, while paying limited attention to the lived experiences of individuals working within compliance systems.

In particular, there is a lack of research in emerging market contexts, where institutional conditions, regulatory environments, and technological adoption patterns may differ from those in developed economies. Kazakhstan represents a valuable case for exploring these dynamics, as its banking sector has rapidly adopted digital compliance technologies while operating within a distinct institutional framework.

This study contributes to addressing this gap by providing an in-depth qualitative analysis of how digital transformation reshapes compliance practices, decision-making, and professional autonomy in the banking sector.

4. Results

4.1 Transformation of Workflows: From Case-Based to System-Driven Processes

One of the most prominent findings of the study is the transformation of compliance workflows from case-based, manually driven processes to system-driven operations structured around digital tools. Participants consistently reported that their daily work is no longer organized around individual cases or client files, but rather around system-generated alerts and risk indicators.

“Before, we would review client files and transactions step by step. Now, we log into the system, and it tells us what requires attention.” (P1)

This shift represents a fundamental reconfiguration of how compliance work is organized. Digital systems define priorities, sequence tasks, and determine which cases require investigation. As a result, compliance professionals increasingly operate within predefined workflows that are structured by technological systems.

This transformation enhances efficiency and allows for the processing of large volumes of data. However, it also reduces flexibility, as professionals have limited control over how tasks are prioritized and performed.

4.2 Hybridization of Decision-Making

The findings indicate that decision-making in compliance has become increasingly hybrid, involving interaction between human judgment and algorithmic outputs. In most cases, digital

systems perform initial risk assessments by analyzing transaction patterns and generating alerts. Compliance professionals then review these alerts and make final decisions.

"The system flags the transaction as suspicious. Our role is to analyze it and confirm whether it is suspicious or not." (P2)

This hybrid model of decision-making reflects a redistribution of cognitive tasks. The system performs data-intensive analysis, while humans focus on interpretation and validation. However, this does not necessarily imply equal participation. In many cases, the system effectively sets the parameters within which decisions are made.

Participants reported that system outputs strongly influence their judgments, even when they have the authority to override them. This suggests that algorithmic systems exert a form of "soft control," shaping decisions without fully replacing human agency.

4.3 Reconfiguration of Professional Autonomy

A key finding of the study is the reconfiguration of professional autonomy. While digital tools enhance efficiency and consistency, they also constrain the scope of independent judgment.

"There are clear rules in the system. You cannot just interpret things freely anymore." (P3)

Participants noted that decision-making is increasingly guided by system rules, predefined risk thresholds, and standardized procedures. This reduces the need for individual interpretation but also limits flexibility in handling complex or ambiguous cases.

At the same time, some participants emphasized that autonomy has not disappeared entirely but has been transformed. Rather than making decisions independently, professionals now operate within systems that define the boundaries of acceptable action.

4.4 Standardization and Control

Digital compliance systems contribute to the standardization of processes across the organization. By embedding regulatory rules into technological systems, banks ensure that compliance procedures are applied consistently.

This standardization enhances control and reduces the risk of human error. However, it may also lead to rigid processes that do not fully account for contextual factors.

Participants reported that standardized workflows make it easier to train new employees and ensure consistency across departments. At the same time, they expressed concerns that excessive standardization may reduce the ability to respond to unique situations.

4.5 Transformation of the Bank–Client Relationship

Digital transformation also affects how banks interact with clients. Processes such as onboarding, identity verification, and transaction monitoring are increasingly automated, reducing direct human interaction.

"Clients rarely interact with compliance officers directly. Most of the interaction happens through systems." (P4)

This transformation improves efficiency and reduces processing time. However, it may also create challenges related to transparency and trust, as clients may not fully understand how decisions are made.

4.6 Emergence of Algorithmic Authority

A cross-cutting theme in the findings is the emergence of algorithmic authority. Digital systems not only support compliance processes but also define the framework within which decisions are made.

Algorithmic authority manifests in several ways:

- defining risk parameters,
- prioritizing cases,
- structuring workflows,
- and influencing decision outcomes.

This represents a shift from human-centered governance to system-mediated governance, where authority is distributed across socio-technical systems.

5. Discussion

The findings of this study provide strong empirical support for existing theories of digital transformation, algorithmic governance, and socio-technical systems, while also extending them through insights from an emerging market context. In particular, the results highlight how digital compliance systems do not merely enhance efficiency but fundamentally reshape the structure of governance, decision-making, and professional practice within banking institutions.

From a digital transformation perspective, the findings align with the argument that digital technologies reconfigure organizational processes rather than simply improving them (Vial, 2021). In the context of compliance, this transformation is evident in the shift from human-driven workflows to system-driven processes structured around algorithmic outputs. Compliance activities are no longer initiated and organized by professionals but are instead triggered and prioritized by digital systems. This reflects a deeper structural change in how compliance is performed, moving from interpretive practices toward standardized, data-driven processes.

The study also provides empirical support for the concept of algorithmic governance, which emphasizes the role of computational systems in structuring decision-making and regulating behavior (Yeung, 2018). In the findings, algorithmic systems define risk parameters, generate alerts, and shape investigative processes. As a result, decision-making authority is partially transferred from human actors to technological systems. This does not eliminate human involvement but transforms it, positioning compliance professionals as validators of system-generated outputs rather than primary decision-makers.

This redistribution of authority can be understood as a shift toward what may be described as algorithmic authority, where systems exert influence over decisions without fully replacing human agency. Similar to the "code as law" argument proposed by Lessig (2006), digital compliance systems embed regulatory rules into technological infrastructures, effectively governing behavior through design. Compliance professionals operate within these systems, following predefined workflows and rules that constrain discretionary judgment.

From a socio-technical perspective, the findings confirm that compliance practices are produced through the interaction between human actors and technological systems. Rather than replacing human judgment, digital systems reconfigure it. Compliance professionals continue to play a critical role in interpreting alerts, assessing context, and making final decisions. However, their actions are shaped by system constraints, predefined risk models, and standardized procedures.

This hybridization of decision-making reflects a broader transformation in professional roles. Compliance professionals are no longer solely responsible for identifying risks and making independent judgments. Instead, they operate within a framework where systems perform initial analysis and define the scope of possible actions. This transformation can be interpreted as a shift from **discretion-based decision-making** toward **system-mediated decision-making**.

The findings also raise important questions about accountability. In traditional compliance models, responsibility for decisions was clearly attributed to individual professionals. In digitally

mediated systems, responsibility becomes distributed across human and technological components. This creates challenges for assigning accountability, particularly in cases where decisions are influenced by algorithmic outputs. As noted in the literature on regulatory governance (Black, 2008), such polycentric systems complicate traditional notions of responsibility and control.

Another important implication of the findings relates to professional autonomy. While digital systems enhance efficiency and consistency, they also constrain the ability of professionals to exercise independent judgment. The reduction in autonomy observed in this study is consistent with broader concerns about the standardization of work in digitally mediated environments. However, autonomy is not entirely eliminated; rather, it is redefined. Compliance professionals retain the ability to interpret and validate system outputs, but their discretion is exercised within predefined boundaries.

Finally, the transformation of the bank–client relationship reflects broader trends in digital governance. As interactions become increasingly mediated by technological systems, direct human engagement is reduced. While this improves efficiency, it may also affect transparency and trust. Clients may have limited understanding of how decisions are made, particularly when these decisions are based on complex algorithmic processes.

Overall, the findings suggest that digital transformation introduces both opportunities and challenges for compliance governance. While it enhances efficiency, scalability, and consistency, it also raises important questions about autonomy, accountability, and the role of human judgment in increasingly automated systems.

6. Conclusion

This study has examined how digital transformation reshapes compliance practices in the banking sector, with a particular focus on Kazakhstan as an emerging market. By integrating theoretical perspectives on digital transformation, algorithmic governance, and socio-technical systems with empirical data from compliance professionals, the study provides a comprehensive analysis of how digital technologies reconfigure governance structures and professional roles.

The findings demonstrate that digital transformation leads to a fundamental shift from human-driven to system-driven compliance practices. Automated systems structure workflows, define priorities, and guide decision-making processes. As a result, compliance professionals increasingly operate within algorithmically mediated environments where their role is to interpret and validate system outputs rather than independently construct risk assessments.

This transformation reflects a broader shift toward algorithmic governance, where authority is embedded in technological systems (Yeung, 2018). At the same time, the findings highlight the importance of socio-technical interactions, as human actors remain essential for interpreting context, exercising judgment, and ensuring accountability (Vial, 2021).

The study also identifies a reconfiguration of professional autonomy. While digital tools enhance efficiency and standardization, they constrain discretionary decision-making and reshape the nature of professional work. Compliance professionals must adapt to new roles that require both technical competence and the ability to navigate system constraints.

From a practical perspective, the findings suggest that financial institutions should adopt a balanced approach to digital transformation. While automation offers significant benefits, it is important to preserve human oversight and ensure that professionals retain the ability to exercise judgment in complex cases. This is particularly important in compliance contexts, where decisions may have significant legal and ethical implications.

From a theoretical perspective, the study contributes to the literature by providing empirical evidence on how algorithmic governance operates in practice. It highlights the emergence of hybrid decision-making systems and the redistribution of authority between humans and technologies.

Finally, the study has several limitations. The findings are based on qualitative data from a specific national context, which may limit generalizability. Future research could expand the analysis to other countries and compare different regulatory environments. In addition, further research could explore the long-term implications of digital transformation for professional identity, organizational culture, and regulatory effectiveness.

In conclusion, digital transformation is not only changing how compliance is performed but also redefining the nature of governance itself. As financial institutions continue to adopt advanced technologies, understanding the interaction between human judgment and algorithmic systems will become increasingly important for ensuring effective, fair, and accountable compliance practices.

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Chinese Involvement and Connectivity Outcomes in BRI Transport Projects: A Comparative Study of Kazakhstan and Iran

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Abstract

This paper examines how Chinese involvement in Belt and Road Initiative (BRI) transport projects shapes connectivity outcomes through a comparative analysis of Kazakhstan and Iran. While existing literature emphasizes the geopolitical and strategic dimensions of the BRI, less attention has been given to project-level variation in implementation and results. To address this gap, the study compares two cases: the Khorgos–Eastern Gate dry port in Kazakhstan and the Tehran–Mashhad railway electrification project in Iran. Using a qualitative comparative case study design and structured, focused comparison, the paper analyzes the type of Chinese involvement, intended outcomes, realized outcomes, and the factors explaining divergence. The findings show that Chinese involvement was substantial in both cases but produced different results. In Kazakhstan, Chinese finance, ownership participation, and logistics integration contributed to the development of Khorgos as an operational transport hub with visible improvements in capacity and efficiency. In Iran, despite major Chinese financing and contractor involvement, the Tehran–Mashhad project remained weakly implemented and failed to deliver expected connectivity gains. The comparison demonstrates that Chinese involvement does not automatically generate improved connectivity. Instead, outcomes depend on domestic institutional capacity, implementation conditions, and geopolitical constraints such as sanctions. BRI connectivity should therefore be understood as uneven and conditional.

Keywords: Belt and Road Initiative; Chinese involvement; transport connectivity; Kazakhstan; Iran; infrastructure development.

Introduction

Since its announcement in 2013, the Belt and Road Initiative (BRI) has become a major framework for understanding Eurasian connectivity, infrastructure development, and China's expanding external economic role. At its core, the BRI seeks to improve transport, logistics, and cross-border integration across Asia and Europe. According to the World Bank, BRI corridor economies account for nearly 40 percent of global merchandise exports, showing why transport connectivity has become central to debates about trade, development, and regional integration under the initiative (World Bank, 2019).

Kazakhstan and Iran are especially useful cases for studying these dynamics. Kazakhstan occupies a key position in overland Eurasian connectivity and plays an important role in the Central Eurasian Corridor linking China to Europe through rail and logistics routes. Vinokurov (2019) describes this corridor as roughly 7,000–7,500 kilometers long and identifies its southern branch

through Khorgos–Almaty–Kyzylorda as one of the routes with high improvement potential. Kazakhstan is therefore an important land-linked state in wider Eurasian corridor development.

Iran, meanwhile, occupies a strategic position at the intersection of Central Asia, West Asia, the Caucasus, and the Middle East. Recent scholarship suggests that Iran's place in the BRI should not be viewed only through a geopolitical lens, but also through its geoeconomic role as a transit state and market. Iran offers China access to energy, supply chains, and a domestic market of more than 90 million people, while Tehran sees cooperation with China as part of a broader effort to restore Iran's historical role as a Eurasian trade hub despite sanctions (Mohammadi et al., 2025).

Despite the growing literature on the BRI, an important analytical gap remains. Much of the scholarship has focused on macro-level themes such as grand strategy, geopolitical rivalry, debt diplomacy, or state-to-state alignment. While these perspectives are valuable, they often obscure the fact that BRI outcomes are produced through concrete projects implemented in domestic settings. As Jones and Hameiri (2020) argue, BRI analysis must move beyond policy-level and geopolitical approaches to examine China's investments "from the ground." This shift matters because infrastructure projects do not generate uniform outcomes across countries; instead, they are shaped by local institutions, financing arrangements, domestic politics, and implementation capacity.

This paper addresses that gap through a project-level comparative approach. Rather than asking what the BRI means in general for Kazakhstan or Iran, it examines how Chinese involvement in two specific transport connectivity projects shaped outcomes. The two cases are Khorgos–Eastern Gate in Kazakhstan and the Tehran–Mashhad railway electrification project in Iran. These cases are useful because both are linked to wider Eurasian connectivity ambitions, yet they differ sharply in implementation trajectory and realized results. On the Kazakhstan side, Chinese-linked investment and logistics cooperation were translated into a functioning dry port and logistics complex. In Iran, by contrast, the Tehran–Mashhad project was expected to modernize 926 kilometers of railway, but by mid-2019 it had reportedly achieved only 3 percent completion.

Accordingly, this paper asks: How has Chinese involvement in selected BRI-linked transport connectivity projects shaped connectivity outcomes in Kazakhstan and Iran? It argues that Chinese involvement does not automatically produce realized gains in connectivity. Instead, outcomes depend on how external finance and contracting interact with domestic political, institutional, and geopolitical conditions. The study, therefore, shows that BRI connectivity should be examined not only as a geopolitical vision but also as a set of uneven project-level processes whose outcomes vary across contexts in practice.

More specifically, the comparison is designed to show that the same external actor can generate different results depending on implementation conditions. In Kazakhstan, the institutional setting was more favorable to operationalization and corridor integration. In Iran, however, financing uncertainty, sanctions pressure, and implementation problems constrained the translation of Chinese commitments into realized infrastructure outcomes. By comparing these two cases, the paper moves beyond broad claims about the BRI and shows that connectivity is a conditional and politically embedded process rather than an automatic consequence of Chinese involvement alone.

Literature Review

The literature on the Belt and Road Initiative (BRI) is extensive, but it is also uneven in focus, method, and scale. Some works interpret the BRI as a broad framework of connectivity, infrastructure, and development, while others examine particular corridors, countries, or sectors. For this paper, the literature is best reviewed in five layers: general BRI scholarship, Kazakhstan-

focused studies, Iran-focused studies, comparative regional work, and the remaining research gap. Taken together, these strands show that the BRI has been well examined at the macro and strategic levels, but less consistently at the level of concrete project outcomes.

The general literature provides the conceptual starting point. Liu and Dunford (2016) interpret the BRI as a form of inclusive globalization built around infrastructure, industrial cooperation, outward investment, and diversified trade and energy routes. Their main strength is that they do not reduce the BRI to pure geopolitics; instead, they link it to China's domestic restructuring and search for a new mode of global economic engagement. Blanchard and Flint (2017) complement this perspective by framing the BRI as a large connectivity project that combines hard infrastructure with soft infrastructure such as institutions, trade agreements, and policy coordination. These studies are useful because they clarify that the BRI is not merely a slogan or a set of isolated projects, but a wider political-economic project. At the same time, both remain closer to the level of general ambition than to the level of project divergence, which limits their usefulness for explaining why one project succeeds and another stalls.

A second cluster of general studies adds political economy and implementation to the discussion. Ye (2020) argues that the BRI should be understood through the lens of state-mobilized globalization, meaning that Chinese leaders use large national strategies to mobilize bureaucracies, local governments, and firms during moments of domestic political-economic pressure. This is an important contribution because it moves the discussion beyond leader-centered geopolitics and locates the BRI in China's own internal governance and development logic. Zhou et al. (2021), from a transport perspective, show that BRI-related network research often studies rail, maritime, or air systems separately, while multimodal integration remains less developed. The World Bank (2019) adds a strong empirical benchmark by arguing that BRI transport investments may reduce travel times, lower trade costs, and improve welfare, but only where governance, debt management, and complementary reforms are sufficient. The strength of this literature lies in presenting the BRI as conditional and multidimensional. Its main limitation is that it still privileges system-level analysis over project-level variation.

The Kazakhstan-focused literature is smaller, but it is sufficient to establish why Kazakhstan is a critical BRI case. Svetlana (2020) presents Kazakhstan as a core overland partner, emphasizing its strategic geography, the alignment between the Silk Road Economic Belt and Nurly Zhol, and the centrality of Khorgos as a dry-port and transit project. Rakhmetulina, Abylaikhanova, and Kinasheva (2020) likewise examine the integration of BRI and Nurly Zhol and identify trade, infrastructure modernization, production cooperation, and finance as the major fields of Sino-Kazakh interaction. Berlie and Benard (2024) extend this discussion through the Middle Corridor, highlighting Kazakhstan's potential to diversify away from Russia-centered routes and strengthen its logistical significance between China and Europe. These works are useful because they establish Kazakhstan as a transit state, a corridor hub, and an active policy partner rather than a passive recipient of Chinese capital.

However, the Kazakhstan literature is often more descriptive than analytical. It maps policy convergence, infrastructure plans, and trade potential well, but it is less systematic in tracing whether Chinese participation actually produced realized connectivity improvements. Much of this scholarship emphasizes Kazakhstan's opportunity structure, its transit geography, and state support for corridor development, but fewer studies move to the next step of evaluating operational outcomes such as efficiency, capacity utilization, or sustained logistics performance. In this sense, the Kazakhstan literature is strong on background and relevance, but thinner on causal assessment.

The Iran-focused literature is analytically richer in one important respect: it takes obstacles seriously. Madani (2022) is especially valuable because it argues that a large share of BRI

scholarship focuses on China's motivations while underexamining the significant challenges and prospects in host countries. He further contends that Iran–China BRI relations are better explained through geoeconomics than through geopolitics alone. This is highly relevant for the present paper because it highlights Iran's strategic transit value while also foregrounding operational, financial, and geopolitical risks. Mohammadi, Sohrabi, and Rabiei (2025) similarly argue that Iran's location gives it major geoeconomic potential within the BRI, but they also stress that Iran has not fully benefited from this potential in practice. Gholizadeh, Yu, and Saneinia (2025), although focused on energy trade networks, also note that the structural and resilience effects of China–Iran cooperation remain less studied than broader geopolitical narratives.

The strength of the Iranian literature is therefore its attention to friction, constraint, and implementation risk. Unlike some Kazakhstan studies that emphasize opportunity more heavily, Iran-focused works consistently treat infrastructure outcomes as politically embedded and institutionally vulnerable. Their main limitation is that many of them are centered on energy, sanctions, or geoeconomics rather than on transport projects alone. Even so, they are highly useful for developing a framework in which large Chinese commitments do not automatically generate successful project delivery.

Direct comparative studies of Kazakhstan and Iran are more limited, but there is enough regional scholarship to support comparison. Amineh et al. (2025) are especially important because they analyze Kazakhstan and Iran together within Central and West Asia and argue that BRI outcomes depend not only on Chinese investment and infrastructure activity, but also on domestic structural challenges and wider geopolitical conditions. This is particularly useful because it avoids treating host countries as uniform and instead shows that state capacity, market conditions, and regional pressures shape outcomes differently across cases. Rezaeinejad, Zeraat Peyma, and Dou (2023) also discuss Kazakhstan and Iran within the same BRI-oriented frame, emphasizing opportunities for cooperation while acknowledging the risks of dependence, rivalry, and uneven gains. These studies are useful because they provide a shared analytical space for both countries. Their limitation is that they rarely compare specific projects directly, leaving room for more focused project-level work.

The central gap follows from this pattern. Existing scholarship explains the BRI well at the macro, strategic, and corridor levels. It also explains why Kazakhstan and Iran matter individually. However, it is less consistent in showing how similar Chinese ambitions generate different project-level connectivity outcomes across contrasting domestic and geopolitical environments. Madani (2022) explicitly notes that host-country challenges remain underexamined, while Amineh et al. (2025) argue that large-N and fragmented regional studies often miss contextual and domestic structural sources of difficulty. Kazakhstan scholarship tends to emphasize corridor potential more than implementation limits, while Iran scholarship often emphasizes sanctions and geoeconomic significance without always tracing transport outcomes systematically. This paper addresses that gap by comparing two concrete cases—Khorgos–Eastern Gate and the Tehran–Mashhad electrification project—and examining how the type and depth of Chinese involvement interacted with domestic conditions to shape realized connectivity.

Overall, the existing literature is useful not because it gives one single answer, but because it reveals the BRI as both ambitious and uneven. The strongest studies do not romanticize connectivity; instead, they show that infrastructure can open opportunities while also producing fragility, dependence, and divergence. That balance is crucial for the present study, which treats Kazakhstan and Iran not as proofs for or against the BRI, but as cases demonstrating why Chinese involvement must be examined through project-level outcomes rather than broad strategic narratives.

Methodology

This study employs a qualitative comparative case study design to examine how Chinese involvement shapes connectivity outcomes in BRI-linked transport projects. The research focuses on two cases: the Khorgos–Eastern Gate dry port in Kazakhstan and the Tehran–Mashhad railway electrification project in Iran. These cases were selected because both are strategically linked to broader Eurasian connectivity under the Belt and Road Initiative, yet they display sharply different implementation trajectories and outcomes. The unit of analysis is the individual transport infrastructure project. This allows the study to move beyond macro-level interpretations of the BRI and instead focus on how outcomes are produced in specific institutional and political contexts.

The analysis is structured through a structured, focused comparison. This method applies the same analytical questions to both cases, ensuring comparability. Specifically, the study examines:
(1) the type and level of Chinese involvement,
(2) the intended connectivity outcomes,
(3) the realized outcomes, and
(4) the factors explaining divergence between expectation and reality.

The independent variable is the level and type of Chinese involvement, which includes financial arrangements, contractor participation, and ownership or partnership structures. The dependent variable is the connectivity outcome, operationalized through indicators such as corridor expansion, logistics performance, operational capacity, and realized connectivity. In addition, the study incorporates intervening variables, including host-state institutional capacity, implementation environment, and geopolitical constraints such as sanctions. These factors are treated as shaping how Chinese involvement is translated into actual outcomes. The empirical analysis relies on secondary data sources, including project databases (such as AidData), institutional reports, policy documents, and academic literature. These sources provide information on project design, financing structures, implementation progress, and operational performance.

Kazakhstan

Khorgos–Eastern Gate is a strong case showing that Chinese involvement under the BRI can translate into measurable connectivity gains. Established in 2011 and operating since 29 July 2015, the special economic zone covers 4,591 hectares and combines a dry port, logistics zone, and industrial zone. Its inland container dock was designed for 540,000 TEU annually and six berths, while linking directly to Altynkol Station, the Zhetygen–Khorgos railway, and the West Europe–West China highway. This makes Khorgos a multimodal corridor node rather than a single facility (SEZ Union, n.d.).

The scale of Chinese involvement is substantial and should be coded as high. Earlier assessments report that the Chinese side invested 23.45 billion yuan across 26 major projects, while Kazakhstan invested about 65 billion tenge in infrastructure on its side. Narekesh and Azmukhanova (2021) further estimate the total project cost at 522.7 billion tenge, of which 79.3% came from private investment and 20.7% from the republican budget. Later ownership arrangements preserved Kazakh control but embedded Chinese capital in operations: KTZ retained 51%, while COSCO Shipping and the port of Lianyungang jointly acquired 49%, creating a hybrid model of national control, Chinese cargo sourcing, and international terminal management (Hanayi, 2017; Narekesh & Azmukhanova, 2021; Yerimpasheva et al., 2025).

Operationally, the project has delivered clearer outcomes than many BRI cases. According to Yerimpasheva et al. (2025), throughput rose from 73,000 TEU in 2015 to about 180,000 in 2018, 200,000 in 2020, and 320,000 in 2023–2024. More recent reporting states that the dry port handled more than 372,000 TEU in 2025, a 2% increase over 2024. Infrastructure expansion also improved

efficiency: ten new broad-gauge tracks were added, and average container handling time reportedly fell from five hours to one hour. These figures indicate not just construction, but real gains in operational capacity, speed, and throughput (Astana Times, 2026; Yerimpasheva et al., 2025).

Khorgos strengthened Kazakhstan's wider corridor role. Narekesh and Azmukhanova (2021) show that rail transit freight through Khorgos reached 2.584 million tons between 2013 and April 2016, while transit cargo through Khorgos rose from 0.16 million tons in 2006 to 3.97 million tons in 2015, increasing its share from 4.9% to 12.0%. Hanayi (2017) adds that total transit through the zone reached 25.79 million tons in 2015 and 23.88 million tons in January–November 2016, despite broader market volatility. More recent data suggest Kazakhstan–China rail cargo reached 32 million tons in 2024, confirming that Khorgos operates within a larger Eurasian rail system (Hanayi, 2017; Narekesh & Azmukhanova, 2021; Yerimpasheva et al., 2025).

Still, the case should not be romanticized. Khorgos faces growing bottlenecks in customs coordination, documentation, and route management as volumes rise. Astana Times reports that trade through Khorgos increased from nearly $10 billion in 2022 to $12 billion in 2023 and about $12.5 billion in 2024, but also notes slowing growth and stronger competition from alternative routes. Yerimpasheva et al. (2025) explicitly warn that the commercial sustainability of the corridor remains partly dependent on Chinese subsidies and external demand. Local development is also uneven: the zone created 1,135 permanent jobs by March 2025, with plans to double this by the end of 2026, yet warehousing and transit still dominate over deep local processing (Astana Times, 2025, 2026; Yerimpasheva et al., 2025).

Overall, Khorgos–Eastern Gate demonstrates that high Chinese involvement can produce realized connectivity gains when host-state capacity, infrastructure planning, and corridor integration are relatively strong. Unlike many stalled BRI projects, Khorgos moved from commitment to performance: higher TEU volumes, faster handling, stronger rail integration, and wider trade flows. Yet its success remains conditional. If subsidies fall, bottlenecks persist, or diversification into higher value-added production fails, Khorgos may remain a successful transit hub without becoming a transformative platform for Kazakhstan (Astana Times, 2025, 2026; Yerimpasheva et al., 2025).

Iran

The Tehran–Mashhad railway electrification project illustrates the limits of Chinese involvement under the Belt and Road Initiative (BRI) when ambitious financing and engineering commitments collide with sanctions, implementation problems, and domestic institutional constraints. At the design stage, it was one of the largest rail modernization projects in Iran: a 926-kilometer double-track main line connecting Tehran with Mashhad, one of the country's most important passenger and pilgrimage corridors. The project aimed to electrify both tracks, raise maximum speed from 160 km/h to 200 km/h, and cut journey time from about 12 hours to 6 hours (AidData, n.d.; Tinn, 2017). It was also expected to expand annual capacity sharply. Different sources cite targets of 25 million, 33 million, or 35 million passengers per year, plus around 10 million tons of cargo, which shows some inconsistency in project reporting but also reflects the scale of the intended upgrade (AidData, n.d.; Financial Tribune, 2017; Tinn, 2017).

Chinese involvement in this case was deep and clearly measurable. On 25 July 2017, China Eximbank signed a loan agreement worth roughly $1.5 billion for the project, while Iran committed about $200 million of its own financing (AidData, n.d.; Financial Tribune, 2017). AidData reports that the loan had a 16-year maturity and a 6-year grace period, and that it financed about 85% of an RMB 11.5 billion commercial contract with China National Machinery Import and Export Corporation (CMC) under a Sinosure-backed arrangement supported by an Iranian sovereign

guarantee (AidData, n.d.). Chinese participation was therefore not limited to funding. CMC served as the principal Chinese contractor, with Iran's MAPNA as the main domestic partner and other firms reportedly involved in equipment and implementation (AidData, n.d.; Financial Tribune, 2017). By any comparative standard, this should be coded as a high level of Chinese involvement: large-scale state-backed credit, Chinese engineering participation, and direct integration into a broader BRI rail vision.

Strategically, the project mattered far beyond a domestic passenger upgrade. Iranian and external sources linked it to the wider "New Silk Road" and to China's overland corridors through Central Asia into Iran, with onward extension toward Turkey and Europe (Financial Tribune, 2017; Zreik, 2023). In theory, electrifying the Tehran–Mashhad line would have strengthened Iran's internal rail backbone while improving its usefulness as a Eurasian land bridge. This matched Tehran's broader objective of restoring Iran's role as a regional logistics hub and China's goal of developing alternative overland routes less vulnerable to maritime chokepoints and geopolitical disruption (The Diplomat, 2025).

Yet the case is analytically important precisely because these expected gains did not materialize. Although implementation was officially expected to take 48 months, progress remained extremely limited. AidData records that by June 2019, the project had achieved only 3% completion, and by January 2021, there were reports that CMC had withdrawn from the project altogether (AidData, n.d.). In other words, a project with massive financing, strong political backing, and high strategic value failed to generate realized connectivity outcomes. Unlike Khorgos, where Chinese capital translated into rising throughput and faster operations, the Tehran–Mashhad project remained largely a promise.

The most convincing explanation lies in the interaction of external and domestic constraints. U.S. secondary sanctions made large Chinese banks and state-owned enterprises more cautious in Iran, even when the political relationship remained strong (The Diplomat, 2025). Iran's broader BRI implementation environment was also shaped by financing uncertainty, regulatory obstacles, and geopolitical risk, all of which limited the operationalization of corridor projects (Zreik, 2023). Therefore, the Tehran–Mashhad project shows that Chinese involvement alone is not sufficient to produce connectivity gains. High finance and formal contracts can create ambitious plans, but without stable implementation conditions, they do not necessarily deliver faster transport, higher capacity, or stronger corridor integration in practice for Iran or the wider corridor.

Comparative Study

The comparison between Khorgos–Eastern Gate and the Tehran–Mashhad railway electrification project shows that Chinese involvement under the Belt and Road Initiative (BRI) does not produce uniform connectivity outcomes. In both cases, Chinese participation was substantial, state-linked, and strategically connected to wider Eurasian corridor ambitions. Yet the results diverged sharply. Khorgos became an operational logistics hub with rising throughput, faster handling, and growing corridor integration, whereas Tehran–Mashhad remained largely an unrealized rail modernization scheme despite large Chinese financing and ambitious technical goals. The comparison, therefore, suggests that the decisive variable is not the presence of Chinese capital alone, but the interaction between Chinese involvement and host-country implementation conditions.

At the level of project design, both cases were strategically important. Khorgos–Eastern Gate was established in 2011 and launched in 2015 as a dry port and special economic zone connecting China with Kazakhstan, the Caspian region, and Europe. Yerimpasheva et al. (2025) report an initial port capacity of 540,000 TEU per year, storage capacity of 18,000 TEU at a time, and

handling potential of 5–6 container trains per day, with future expansion to 10 trains. The broader Khorgos complex was supported by road, rail, and logistics investments, including the Zhetygen–Khorgos line and links toward Aktau and the Middle Corridor. By contrast, Tehran–Mashhad was a 926-km double-track electrification project designed to raise line speed from 160 to 200 km/h, cut travel time from 12 hours to 6 hours, and expand annual capacity to around 25 million passengers and 10 million tons of cargo, with some sources projecting even higher passenger numbers (AidData, n.d.; Financial Tribune, 2017).

Table 1. Comparative Analysis of Khorgos and Tehran–Mashhad Projects

Dimension	**Kazakhstan**	**Iran**
Chinese involvement	Strong	Strong
Implementation	Strong	Weak
Operational outcome	Strong	Low
Connectivity effect	Strong	Low
Constraints	Moderate	Strong
Overall result	Realized connectivity	Unrealized potential

Chinese involvement was high in both cases, but structured differently. In Kazakhstan, Chinese participation combined investment, ownership, and commercial integration. Chinese investors COSCO Shipping and the port of Lianyungang acquired 49% of the Khorgos dry port, while KTZ retained 51%, creating a hybrid model in which Kazakhstan kept formal control but Chinese actors helped attract cargo flows and logistics expertise (Yerimpasheva et al., 2025). In addition, earlier estimates suggest the Chinese side invested 23.45 billion yuan in the wider Khorgos complex, while Kazakhstan invested about 65 billion tenge in infrastructure on its side. In Iran, Chinese involvement took a more finance-and-contractor form. China Eximbank signed a $1.5 billion loan agreement in July 2017, reportedly financing about 85% of an RMB 11.5 billion commercial contract with China National Machinery Import and Export Corporation (CMC), backed by Sinosure and an Iranian sovereign guarantee (AidData, n.d.). Thus, both cases had strong Chinese participation, but Khorgos embedded China into an operating platform, while Tehran–Mashhad depended more narrowly on state-backed project finance and engineering delivery.

The greatest divergence appears in realized connectivity outcomes. Khorgos generated measurable gains. Throughput rose from about 73,000 TEU in 2015 to 180,000 in 2018, 200,000 in 2020, and 320,000 in 2023–2024; more recent reporting places 2025 throughput above 372,000 TEU (Yerimpasheva et al., 2025). Operational performance also improved: handling time reportedly fell from about five hours to one hour after new broad-gauge tracks and digital upgrades were introduced. Kazakhstan–China rail cargo reached a record 32 million tons in 2024, of which 15.3 million tons were transit, confirming Kazakhstan's growing role as a functioning Eurasian corridor state (Yerimpasheva et al., 2025). In Iran, the opposite occurred. Despite formal groundbreaking in 2016 and financing in 2017, AidData records that by June 2019, the project was

only 3% complete, and by January 2021, there were reports that CMC had withdrawn. In other words, the Iranian case produced planned connectivity rather than realized connectivity.

The comparison, therefore, points to domestic and geopolitical context as the main explanation for divergence. Kazakhstan offered a relatively stable investment environment, a clearer multimodal corridor strategy, and a partnership model that linked Chinese participation to immediate commercial throughput. Iran, by contrast, faced U.S. secondary sanctions, financing uncertainty, procurement constraints, and high geopolitical risk. Usman et al. (2025) note that Iran's oil exports recovered from 0.3 to 1.3 million barrels per day between 2020 and 2023 through BRI-linked logistical and financial workarounds, but they also stress that project delays, overdependence on China, and limited domestic diversification constrained full strategic autonomy. The Tehran–Mashhad case fits this pattern precisely.

Overall, Khorgos represents an operationalized BRI connectivity outcome, while Tehran–Mashhad represents a partially financed but weakly implemented BRI connectivity project. Both cases confirm that Chinese involvement matters, but they also show that it becomes effective only when host-state conditions allow external finance and contracts to be translated into actual corridor performance. This is the central comparative finding of the study overall.

Conclusion

This paper examined how Chinese involvement in selected BRI-linked transport connectivity projects shaped connectivity outcomes in Kazakhstan and Iran. Its central argument is straightforward: Chinese involvement does not automatically improve connectivity. It produces real results only when local conditions allow projects to be completed, operated, and integrated into wider transport networks. In this study, those conditions were more favorable in Kazakhstan than in Iran.

The comparison between the Khorgos–Eastern Gate and the Tehran–Mashhad railway electrification project supports this conclusion clearly. In Kazakhstan, Chinese involvement was translated into measurable connectivity gains. Khorgos developed into a functioning dry port and logistics hub with rising throughput, improved handling efficiency, and stronger links to Eurasian transport corridors. Chinese participation combined finance, logistics cooperation, and partial ownership, but these external inputs were matched by a relatively stable policy environment and a host state that was able to operationalize the project. As a result, Khorgos moved from infrastructure planning to real corridor performance.

In Iran, Chinese involvement was also substantial. The Tehran–Mashhad project received major Chinese state-backed financing, involved Chinese contractors, and was expected to modernize one of Iran's most important railway lines. On paper, it promised faster travel, greater passenger and cargo capacity, and stronger integration into wider Eurasian rail routes. In practice, however, these outcomes did not materialize. Sanctions pressure, financial uncertainty, and implementation difficulties prevented the project from moving beyond a limited stage. Chinese commitment, therefore, created unrealized potential rather than realized connectivity.

The broader implication is that BRI projects should not be judged only by the size of Chinese loans, contracts, or political declarations. Those factors matter, but they are only part of the story. What matters more is whether host-country institutions, geopolitical circumstances, and implementation capacity allow external support to become actual infrastructure performance. This is why two strategically important projects with strong Chinese involvement produced sharply different outcomes. This project-level finding is the paper's main contribution to comparative research on Eurasian transport infrastructure under the BRI.

The answer to the research question is therefore clear. Chinese involvement shaped connectivity outcomes in both Kazakhstan and Iran, but in different ways. In Kazakhstan, it helped produce real and measurable corridor gains. In Iran, it produced ambitious plans but limited results. The study therefore shows that the key issue is not simply whether China is involved, but whether domestic and geopolitical conditions allow that involvement to be converted into effective connectivity on the ground.

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Colonialism is death, long live digitalisation: the case of Kazakhstan's internet connectivity

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Abstract

The development of international communications has usually evolved around a strong imperial centre that needs to coordinate the workings of the empire over large distances. From the Romans to the British and the US, imperial policies have facilitated the spread and adoption of communication technologies and the social changes that they bring.

While the internet has undoubtedly evolved as a decentralised space that no single actor can control, its architecture reflects the power dynamics that constructed it, and current trends warn of it territorialisation. As a result of the rapid digitalisation, the internet is reaching regions of the globe that had remained on the margins of Western modern society.

Understanding how the internet is structured allows us to question dependencies, strategic vulnerabilities, and the colonial mindset of extraction that fuels the current facet of digitalisation. This paper examines Kazakhstan, a relatively young country pursuing rapid state-sponsored digitalisation, the challenges it faces, and how it has responded to the spread of colonial logics embedded in the global digital transition.

Keywords: digitalisation, digital colonialism, Central Asia, dependency theory, decolonialism.

Introduction

"Hay quienes creen que el destino descansa en las rodillas de los dioses, pero la verdad es que trabaja, como un desafío candente, sobre las conciencias de los hombres."

"There are those who believe that destiny rests over the knees of the gods, but in reality, it works, like a red-hot challenge, over the consciousness of men."
Eduardo Galeano

The internet emerged from ARPANET, a project launched in 1969 by the Advanced Research Projects Agency of the United States Department of Defence. During the 1970s, collaboration between military agencies and academic researchers led to the development of key technologies that would become the foundations of the modern internet, particularly the Transmission Control Protocol/Internet Protocol (TCP/IP), while earlier research into packet switching made large-scale computer networking possible (Abatte, 1999, pp. 127-130).

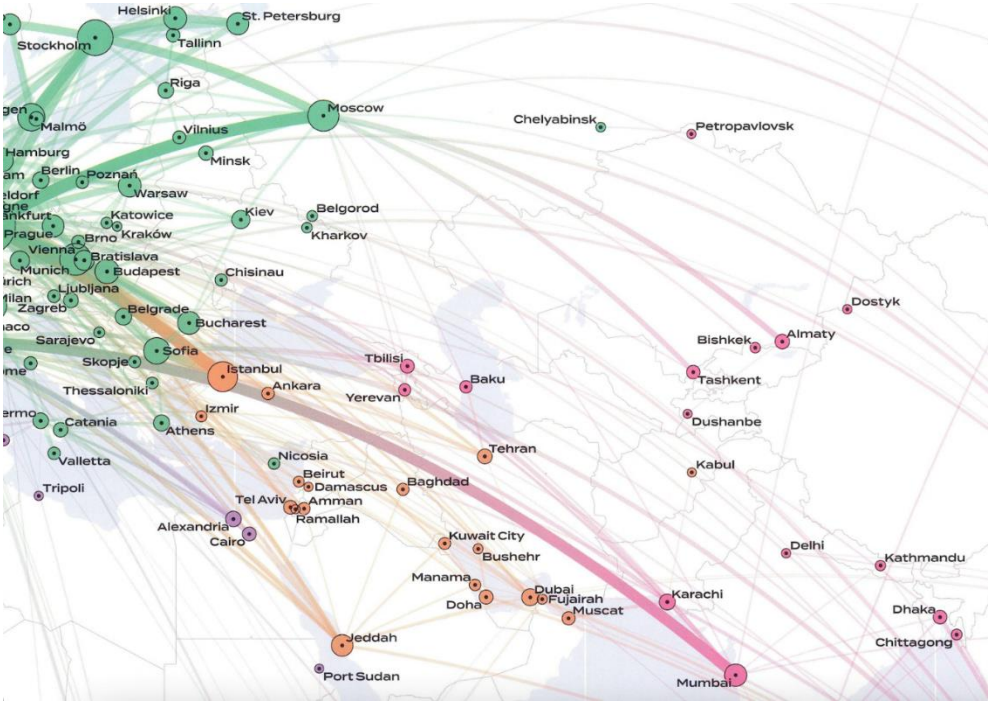
Much like the Space Race, the development of the early internet addressed communication and security concerns characteristic of the Cold War, as research networks were funded by the Department of Defence to support academic and technological collaboration. While the expansion and popularisation of the internet is undoubtedly tied to private corporations and market logic, the need for advanced technology and significant investments meant that the internet network was developed from centres strong enough to accept the costs.

The adoption of international communications has historically been tied to strong imperial centres extending their space by facilitating the control and unification of foreign territories (Hills, 2002, p. 4). Indeed, "the concept of empire" can be understood as "an indication of the efficiency of communications" (Innis, 1972, p. 7). Control over international communications networks safeguarded the empire's defence and security (Boyce, p. 81-82 in Finn & Yang, 2009), allowed censorship and surveillance, and, with time, exported a set of values and norms to new territories.

Times of inter-imperial competition saw clashing networks of international communication, such as the British "All-Red Line", the US annexation of strategic islands –Guam, Hawaii, the Philippines, and Puerto Rico– (Tsuchiya & Govella, 2025), or the Japanese communication arteries that would enable the Greater East Asia Co-prosperity Sphere (Yang in Finn & Yang, 2009). In this light, the fall of the Soviet Union gave way to a unipolar world order in which Western international communications spread rapidly during capitalist globalisation.

Moreover, the popularisation of the internet gave rise to new socio-political dynamics enabled by the cyberspace. While early accounts of the digital society focused on positive aspects such as the freedom of public space, the reduction of borders, and even the advent of a global citizen, later academics warned of the dangers of algorithms and surveillance. Along the same lines, recent scholars have coined the term 'digital colonialism' to explain the similarity between the historical violent extraction of colonialism and the expansion of a very specific kind of digitalisation.

It is important to emphasise that digitalisation *per se* is not colonial, but rather the current expression that rests in the hands of a few corporations driven by their own interest. As such, digital colonialism has six particular characteristics identified by Toussaint Nothias (2025) and a seventh of my own making: 1) unequal concentration of power, 2) violent and harmful, 3) extraction, 4) dependency, 5) cultural imperialism, 6) discourse of benevolence and 7) discourse of inevitability.



Map 1: Section of the Global Internet Map 2022. Source: TeleGeography, Inc. Available at: https://www.davidrumsey.com/luna/servlet/detail/RUMSEY~8~1~369637~90137012:Global-Internet-Map-2022#

In this light, the rapid digitalisation of Kazakhstan raises questions of dependency, autonomous development, internet architecture, and narratives that can shed light on the workings of digital colonialism – a force in the process of expansion while these lines are written.

Kazakhstan is an especially useful case study, as it sits between three major technological influences rarely observed elsewhere in the world: the West (the US and Europe), Russia, and China. Additionally, its history of imperial conquest by Russia – and then by the Soviet system's centralisation – means it demonstrates a dependent position in the world system. To illustrate, the following map shows international internet bandwidth between metropolitan areas. Moscow appears as an important nucleus for the ex-Soviet region.

Methodology

Little thought is given to the architecture of the internet, and the constraints it poses in a digitalising world. Literature about e-Governance –when exploring the role of the state– tends to focus on practical reasons and the betterment of public services (Lindgren, et al. 2019), institutional change (Pittaway & Montazemi, 2020), narratives (Homburg & Bekker, 2007), but does not address the dependency questions that digitalising the public administration –one of the most important functions of the state– entails.

To address this research gap, the present paper explores the topology of the internet to map how the data packets travel through the cyberspace. There are two dimensions to the question: the physical and the digital ones. The first one relates to the actual infrastructure of the internet, the network of cables that transmit the signals. This is an important matter, as the possibilities of communication determine the geographical limits of empire (Yang in Finn & Yang, 2009, p. 227) –or in this case, the influence and spread of ways of living. The second one refers to the connections between Autonomous Systems (AS) of the internet for exchanging information.

The maps of the International Telecommunication Union (ITU) and the Submarine Cable Map of TeleGeography give an accurate image of the physical connectivity. For the AS-level topology, in which the internet is a network of networks, twelve Kazakhstani websites were selected from the public and the private sectors. They were chosen for their importance to digital governance and for their role in enabling a digital society, like in the case of banks and their "super apps". The banks are also among the biggest ones in Kazakhstan by assets. Refer to the following table.

Table 1: Critical services and information websites of the digital society in Kazakhstan

Public sector	Private sector
Gov.kz The single platform of government agencies	Kaspi.kz
eOtinish	Halyk Bank
eGov	Bank CenterCredit
Official website of the President of the Republic of Kazakhstan	Jusan Bank (renamed Alatau City Bank)
Official Information Source of the Prime minister of the Republic of Kazakhstan	Freedom Bank Kazakhstan
Central Communications Service under the President of the Republic of Kazakhstan	Bereke Bank

The online tools HostingChecker and RIPEstat were used to extract the Internet Protocol (IP) addresses of the servers of websites and the prefixes that originate there. In the same search, the Autonomous System number was identified, which, at the AS-level topology, can be thought of as nodes in the network of networks.

The working hypothesis was that the dependency would be found at the host level, meaning that the data would be stored abroad by companies like Amazon or Cloudflare, to which some governments entrust the hosting and the cybersecurity of government services. However, Kazakhstan has passed laws requiring critical data and websites to be hosted on its territory. As a result, 11 of the 12 websites are hosted in Kazakhstan. Thus, the dependency was found at a deeper level within the Border Gateway Protocol (BGP), which connects ASes.

Using Hurricane Electric's online tools, the BGP traceroutes were identified, highlighting the upstream ASes that Kazakh websites must connect to yield global visibility. Since Hurricane Electric can only offer a partial, though useful, view of traceroutes and, moreover, the real topology of the internet cannot be fully visualised (Beichuan, 2005), two additional measurements were conducted using RIPE Atlas.

Both IPv4 and IPv6 paths were collected when available, however an important clarification must be made here. The IP addresses of the selected Kazakh websites are all IPv4, but some of the ASes that originate the IP prefix support both protocols. This means that to reach one of the researched websites, only the IPv4 path is valid, even if the AS holds other websites reachable through IPv6. I decided to include them to show how other websites whose IP addresses originate in the AS of interest can achieve global reachability, even if they are not part of the selected websites. A remark will be made every time an IPv6 graph appears to avoid confusion.

The main website of the Kazakhstani e-Governance is gov.kz, which contains the ministries and the *akimat* and consolidates several government functions. An IPv4 measurement of the gov.kz IP address was conducted using 100 probes from the RIPE Atlas system. While only two out of the hundred in the first measurement, and one in the second, succeeded in getting a response from the server, they nonetheless yielded a clear route that can be seen with the Tracemon and Khipu online tools. Failing to establish a connection with the target IP is a common problem with ATLAS probes, since they are publicly announced, and important websites may filter them or deny service to prevent cyberattacks. However, for the purposes of this study, the important result is not the connection, but rather the route.

The paths of the internet

The US-Israel imperialistic aggression on Iran has put the relationship between geography and politics at the forefront of the international scene. Chokepoints like the Strait of Hormuz, Malacca, the channels in Panama and Suez are yet again at the forefront of discussion. It is in times of crisis that the key arteries that transport strategic goods really show their importance.

The architecture of the Internet is similar. While a network of networks, it is highly asymmetrical and depends on key routes under the jurisdiction or control of specific corporations and countries. In volatile times, these strategic vulnerabilities arising from asymmetrical interdependence can be exploited to control the movement of vital goods with harsh consequences, as exemplified by the First World War (Mulder, 2022). In the emerging digital society, few things will be as powerful as control over data and communications.

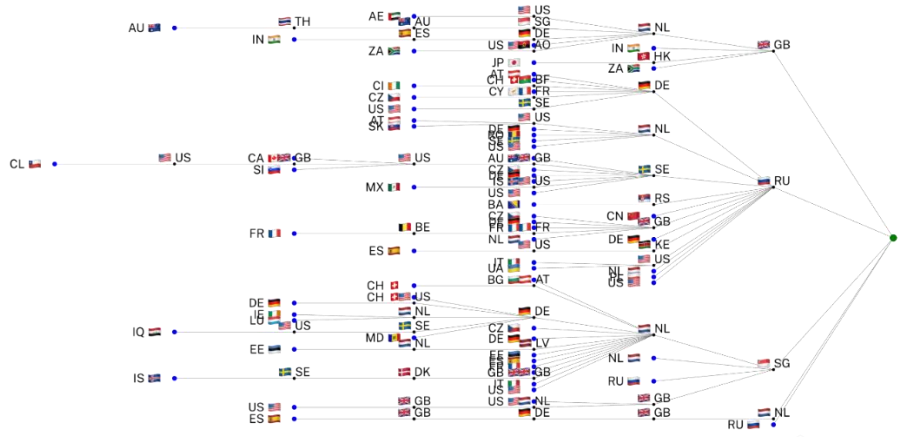


Figure 1: Traceroute to gov.kz IP address from ATLAS probes. Source: Own elaboration with RIPE ATLAS.

The previous image shows the path taken from the ATLAS probes to the gov.kz website. An important concentration is observed around Russian upstream ASes, indicating that web traffic from Kazakhstan must cross Russia to reach global visibility. While there are alternative paths across the United Kingdom, Singapore, or the Netherlands, these represent a minority. Just as in the physical map, the chokepoints signal vulnerabilities. In internet topology, a limited upstream for strategic prefixes –like a public governance website– shows strategic dependency.

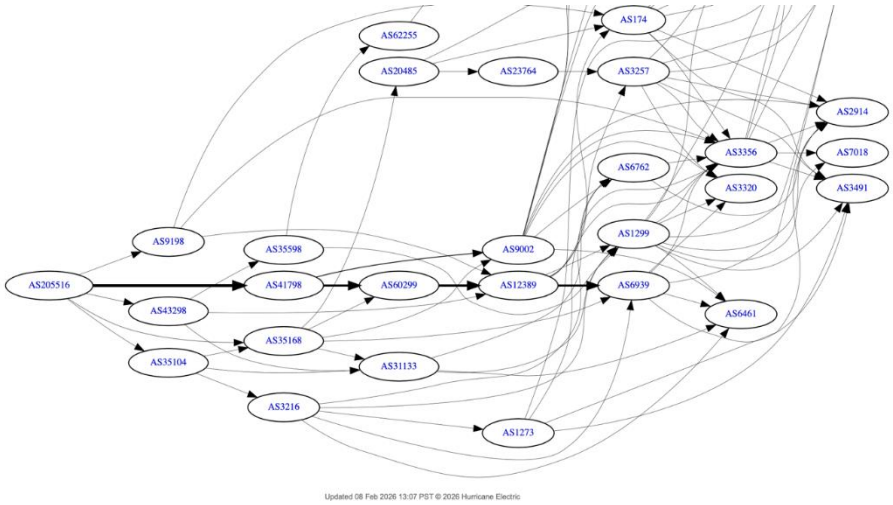


Figure 2: Origin AS BGP graph for the gov.kz website. Source: Hurricane Electric.

Hurricane Electric's toolkit shows a similar picture. For the BGP IPv4, the route crosses JSC Transtelecom (KZ) → Mezhdugorodnyaya Mezhdunarodnaya Telefonnaya Stanciya Ltd. (RU) → PJSC Rostelecom (RU), before reaching Hurricane Electric LLC (US). This means that the Kazakh AS that provides connectivity to the gov.kz website depends on Russian upstream ASes to achieve global visibility. There are secondary paths through JSC Kazakhtelecom (KZ), Storm Networks LLC (RU) and Jusan Mobile (KZ), but the chokepoint through Russia is nonetheless visible.

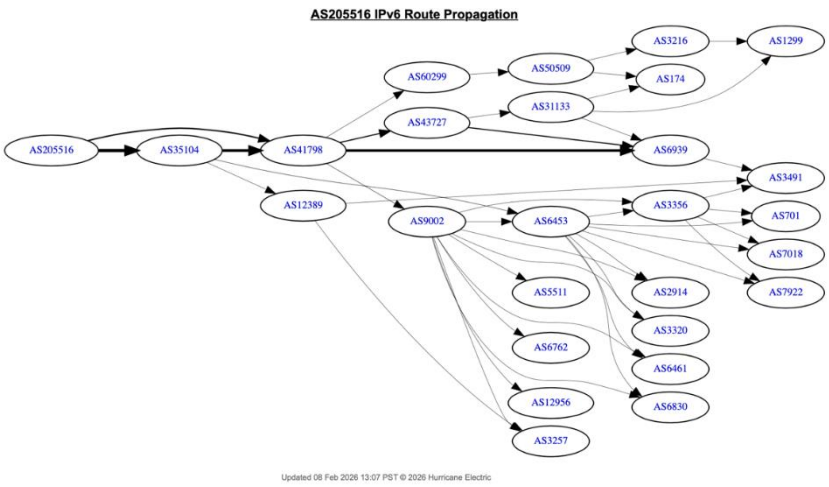


Figure 3: BGP IPv6 for AS205516. Source: Hurricane Electric.

The BGP IPv6[3] of the AS shows a more direct route to global visibility without necessarily crossing Russia. It goes from → Jusan Mobile JSC (KZ) → JSC Transtelecom (KZ) → before reaching Hurricane Electric (US). The secondary routes, however, are via Russian upstreams → PJSC Rostelecom (RU), Mezhdugorodnyaya Mezhdunarodnaya Telefonnaya Stanciya Ltd. (RU), JSC Kvant-Telekom (RU).

It is important to state that RIPE ATLAS and Hurricane Electric's measurements show the route to the AS where, at the time of the measurement, originated the prefix that serves the gov.kz domain. However, RIPEstat shows that the prefix containing the gov.kz IP has been intermittently announced by two Kazakh ASes. This is not uncommon behaviour for government websites. The key takeaway is that despite of the announcing AS, the IPv4 traceroute remains highly dependent on Russian upstreams.

For the private sector, a similar picture emerges. Kaspi.kz is the largest bank in Kazakhstan by assets in billions of tenge (Forbes, 2025) and a major player in the country's digital transition, as exemplified by the cooperation between the bank and the government. The cooperation, which allows Kaspi's mobile app to offer shortcuts to government services, is registered in press releases on both the Official site of the President of the Republic of Kazakhstan and the then Ministry of Digital Development, Innovations and Aerospace Industry (МИИЦР РК / ҚР ЖИЦДМ).

RIPE ATLAS' traceroute for Kaspi.kz shows a higher complexity than the one for gov.kz. Therefore, the results are visualised from a radial perspective to improve visibility. Unfortunately, not a single probe out of the 100 established connections with the IP address, which leads to the cut paths shown in red. However, it is still visible that the majority of the signals have to cross Russia.

Hurricane Electric, Kaspi's domain –which is contacted by the mobile app– benefits from a diversified network in IPv4. However, they all connect eventually to a Russian-based AS, except for a secondary route through RETN Limited (UK).

[3] The IPv6 traceroute does not belong to the gov.kz, but rather shows how IPv6 addresses served in the same AS may be reached.

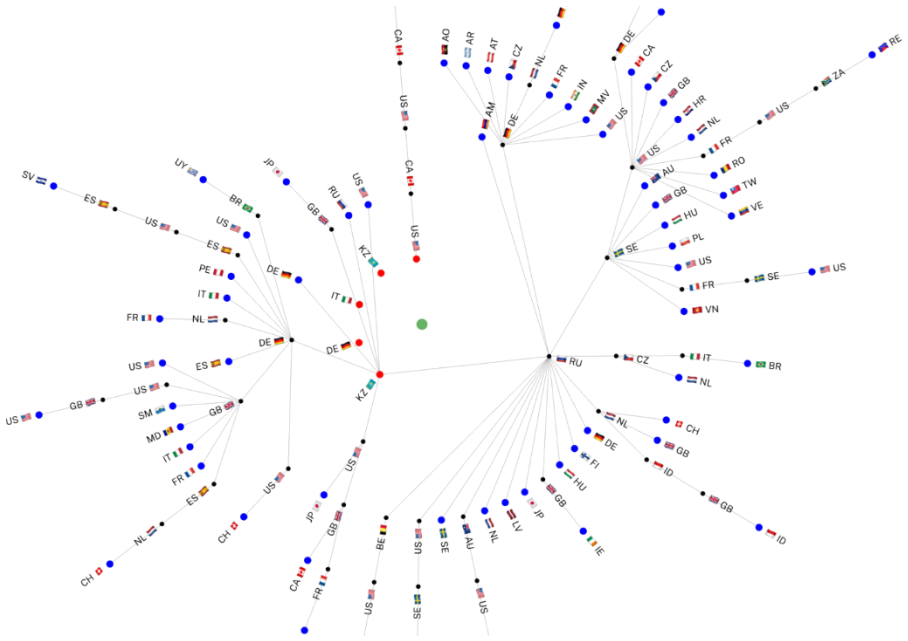


Figure 4: Traceroute to IP address for kaspi.kz from ATLAS probes. Source: Own elaboration with RIPE ATLAS.

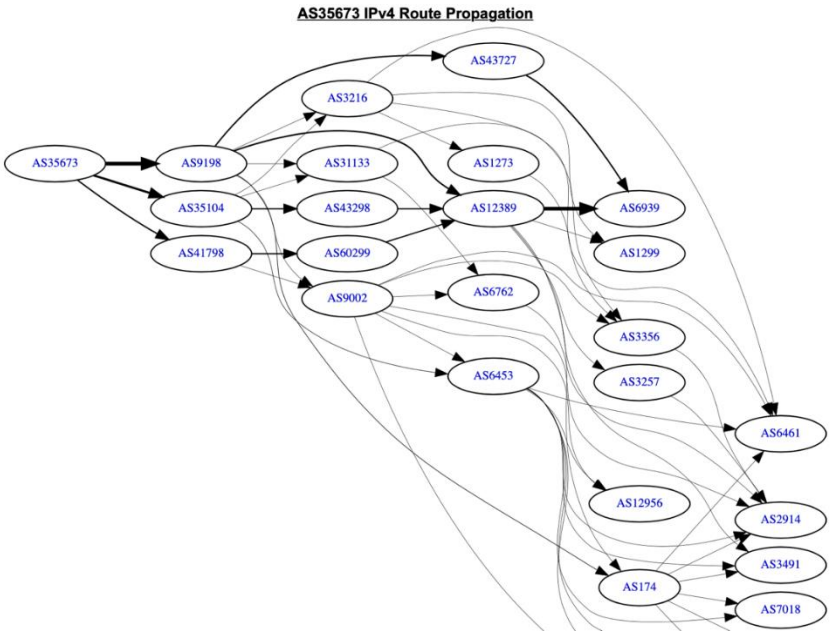


Figure 5: Origin AS BGP graph for Kaspi.kz website. Source: Hurricane Electric.

In IPv6[4], the route connects directly to Hurricane Electric (US) through JSC Transtelecom (KZ). There is a secondary route through Russia: JSC Kazakhtelecom (KZ) → PSJC Rostelecom (RU) / CTGNet (HK).

Similar measurements were performed for the 12 selected websites and are presented in full in the Master thesis on which this paper is based. Due to space limitations, the results shown here correspond only to the most important websites from the public and private sectors: gov.kz and kaspi.kz.

From dependency to digital colonialism

The dependency on Russian internet infrastructure –which in our case study are AS upstreams– is logical due to the historical development of the internet. However, what is the colonial aspect of dependency in a world marked by widespread – even if asymmetrical – interdependence?

Digital colonialism can be understood both as a process and as an emergent structure or order that subordinates peripheries to the interests of central corporations and states in the articulation of logics of extraction. It is, therefore, a way of dominion. Going back to Toussaint Nothias' typology, it has six distinct characteristics, plus one proposed by me.

Firstly, it is enabled by an unequal concentration of power based on ownership and control of three pillars: software, hardware, and network connectivity (Kwet, 2019). The corporations that centralise the technological development that makes digitalisation possible are overwhelmingly from the Global North, and mainly from the US. China has stepped up as a serious player in the digital transition, but its influence is stronger in the regional sphere than on the global[5] stage. Therefore, it is important to note the continuity of the benefits extracted from historical colonialism, which allows today's centres to hold the power they do. Critical history of the Industrial Revolution, for example, has shown how it cannot be explained solely as an English/British innovation when it rested on colonialist appropriation (Siebert, 2024).

Secondly, it presents a violent and harmful dimension. Whether it be the extraction of raw resources for technology, the aggressive penetration into new markets and regions, the possibility of armed intervention, or the discriminatory effects of algorithms (O'Neil, 2016), it actively harms people. This violent facet is not as visible as it was during historical colonialism, partly because it builds on preexisting power structures and partly because it cloaks itself in narratives of benevolence and inevitability. Said narratives have made it a hegemonic myth in the Gramscian sense.

Thirdly, it works on logics of extraction. This means that data, human experience (Zuboff, 2015) and even human life (Couldry & Mejias, 2024) are commodified, extracted, and sold in new markets. This is the most daunting characteristic, one that is being amplified by AI's processing power and has not been taken seriously enough.

Fourthly, it begets dependency. When societies become reliant on certain goods or services – or when they believe they are– the ability to regulate said provision entails control of the population. This is further exacerbated by the erasure or displacement of local goods and services, leaving the imported technology as the sole provider. This dimension is deeper than mere reliance on Hollywood movies for entertainment; it entails altering socio-political structures around the new technology. In this way, social media has become a cornerstone of how people communicate, socialise, and even engage in intimate relationships.

[4] Which doesn't correspond to the kaspi.kz website.

[5] This tendency, however, may be eventually reversed as China continues to invest aggressively around the globe.

Fifthly, it exports cultural imperialism. This means that local cultural expressions are either erased or displaced by the mainstream culture, mainly from the West. Throughout human history, the interaction between cultures and civilisations has led to the mixing of cultures, a process known as syncretism. The distinct feature of cultural imperialism, however, is epistemicide, the belief in the absolute superiority of an imposed cosmovision and the labelling of the subordinated one as "uncivilised", "backwards" or "primitive". This was one of the most violent tools of historical imperialism and one that still affects people all through formerly colonised spaces.

Sixthly, it presents a discourse of benevolence in which the *tech* corporations are benign forces tasked with the betterment of humanity. Innovation is a neutral engine that can only yield a more comfortable, frictionless life for everyone. Corporations are happy to share the rewards of technological advancement with humanity. This narrative masks the huge profits that *tech* corporations make through the exploitation of data, resources from the Global South, and underpaid labour, as well as the shifts in social structures that make people dependent on their products.

Seventhly, it presents itself as inevitable. The narrative asserts that it does not matter that some people may prefer cash or physical keys, because progress is an exogenous force that nobody –not even corporations– controls and that cannot be stopped. Said progress is, of course, linked to Western modern rationality, denying the possibility of other ways of development that may actually be kinder to people and to the environment. It also shifts responsibility away from *tech* corporations.

While digital colonialism affects human life itself as stated by Zuboff and Couldry & Mejias, its effects are distributed along the lines of gender, race, and class. It also affects countries differently, owing to power imbalances stemming from the colonial era. Central countries benefit from robust privacy laws and the rule of law, which primarily ensure compliance with regulations. The structure of the international economy constrains peripheral countries that have to attract foreign investment. As such, corrupt governance enables laxer privacy laws and extractivist practices in both resources and data.

Kazakhstan's peripheral economy was shaped by its inclusion in Western history through its conquest and annexation to the Russian Empire. Decades of control from Moscow under the Soviet Union left a lasting imprint on the socio-political and economic structures. Nelson Maldonado-Torres (2007), drawing on Aníbal Quijano's thought, conceptualises this phenomenon as coloniality: "[the] *long-standing patterns of power that emerged as a result of colonialism, but that define culture, labor, intersubjective relations, and knowledge production well beyond the strict limits of colonial administrations. Thus, coloniality survives colonialism.*"

As a result, even after the breaking of the empires, the colonised societies organised themselves in European-style political units: the nation-state that was built from the Peace of Westphalia in 1648. These nation states tend to homogenisation by nature, subsuming cultural diversity and class struggle, which has led to internal colonial structures in a vast array of the states that achieved their political independence. This phenomenon is very clear in the oligarchic republics formed in Latin America, continuing the Iberian project of erasing the original nations.

The violent and homogenising nature of states means that states are ill-suited for decolonisation efforts, even if their governments actively pursue it. Consequently, when states speak of digital dependency, the focus is on state sovereignty and national security rather than on facing the colonial dimensions of the current form of digitalisation. This is not a failure of governments, but a structural constraint posed by the internal and external workings of the Westphalian state system. In fact, Walter Mignolo (2023) states that: "*Progressive governments are moved by good intentions, but the State entangled in the modern/ colonial world system, is an*

institution that in consortium with the corporations and the mass media, leaves little room for governmental manoeuvres."

In sum, dependency is only the most visible part of digital colonialism, but in order to constitute the emerging form of dominion, it must possess other characteristics. Not all dependencies can be read as a symptom of colonialism. After all, the post-Cold War globalisation is marked by widespread interdependency –albeit asymmetrical. Dependency constitutes digital colonialism when it combines with the coloniality's patterns of power and structures the commodification and extraction of resources (natural, human, data, etc.) to benefit a core at the expense of a periphery. In this way, neocolonial structures produce dependency, while coloniality generates a hegemonic narrative that leads to a form of dominion conceptualised as digital colonialism.

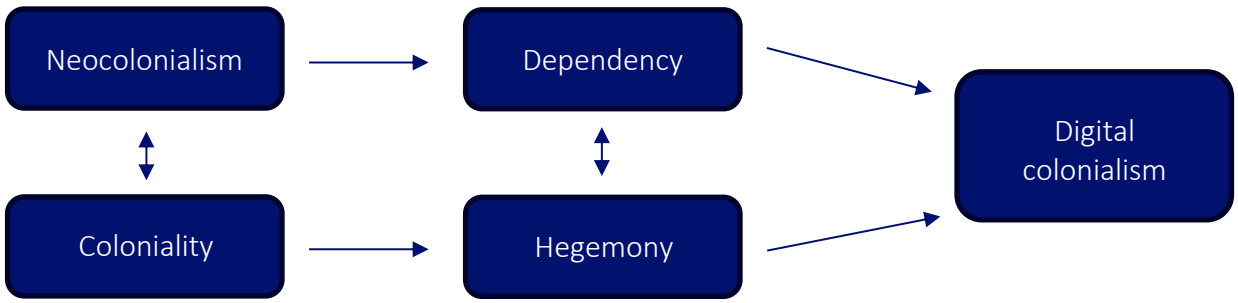


Figure 6: The dimensions of digital colonialism. Source: Own elaboration.

In this context, how do post-colonial countries react to the spreading influence of digital colonialism? Using the case of Kazakhstan, this paper explores the adaptations and strategies governments have adopted in dealing with the spread of digitalisation.

A sovereign in the cyberspace

The Kazakh state has embraced the global trend of digitalisation and made it into a project of its own. Government programmes and close collaboration with the private sector have yielded rapid results – considering the country's relative youth. As such, the 2024 UN E-government Development Index ranks Kazakhstan 24th, ahead of countries such as Canada (47th), Russia (43rd), China (35th), and France (34th). Similarly, the 2024 Online Service Index ranks Kazakhstan at the 10th spot.

As soon as 2006, the government introduced the e-Government portal[6], where citizens can interact with the public administration online. A digital signature provides security to sensitive procedures. A particular characteristic of e-government in Kazakhstan is the public-private partnership with the country's major banks. By 2022, the then Ministry of Digital Development, Innovations and Aerospace Industry (MDDIAI) announced that some government services would be available not only through the eGov portal, but also in the "super apps" of Kaspi and Halyk Bank. These "super apps" aim to consolidate a variety of services on a single platform, such as

[6] The actual digital infrastructure was laid out between 2007-2010, according to the ITU.

payments, shopping, government services, and, in some cases, like VK in Russia, messaging, social media, and entertainment.

The main framework for the Kazakhstani digital transition was the programme Digital Kazakhstan (*Цифрлық Қазақстан* / *Цифровой Казахстан*) that ran from 2018-2022. According to the website of the Digital Government of the Republic of Kazakhstan, it had two main objectives:

1. Accelerating the pace of economic development of the Republic of Kazakhstan and improving the population's quality of life.
2. Creating conditions for the economy's transition to a fundamentally new trajectory - the digital economy of the future.

Five key areas are identified by the state programme: 1) Digitalisation of economic branches, 2) transition to the digital state, 3) innovative ecosystem formation, 4) evolution of the human capital assets, and 5) implementation of the Digital Silk Way. The following table presents the target statistics and the achieved ones during the implementation of the programme. The indicators in green met or exceeded the target, while those in red did not.

Table 2: Statistics of the Digital Kazakhstan State Programme

Key area	Indicator	Target value	Achieved value
Digitalization of economic branches	Share of large and medium-size enterprises using digital technology	11%	7.8%
	Growth of digital payments	35%	175.3%
Transition to the digital state	Level of public satisfaction with the quality of online services	84%	94.6%
	Cities included in the global ranking of Smart Cities	5	2
	Share of public services requests received electronically	80%	85.4%
Innovative ecosystem formation	Number of start-ups supported by *tecnoparks* and incubators	500	257
Evolution of the human capital assets	Students trained in programming in primary school	100%	48.5%
	Number of IT specialists graduated annually (in thousand persons)	30	21.4
	Level of digital literacy of the population	83%	84.1%
Implementation of the Digital Silk Way	Penetration of home-based internet network	84.8%	90.6%
	Provision of broadband internet to the rural Kazakhstan (household unities)	1,250	1,257
	Share of internet users	82%	88.2%

Source: Digital Kazakhstan, available at: https://egov.kz/cms/ru/digital-kazakhstan

As shown in the previous table, the Kazakh state succeeded in spreading the internet and digital technologies, increasing digital literacy, and promoting online public administration. These indicators signal progress in the Kazakhstani digital transition. However, as with the majority of the states, the goal appears to be a digital transition without considering the emerging dimension of digital colonialism.

For its part, the formation of IT specialists may be a useful strategy for reducing dependence on foreign talent; however, it does not address coloniality. In fact, highly educated people will usually reproduce the power structures learnt in Western-style academia, as learnt by African countries after independence and as warned by critical studies theorists.

Governments pursue a digital transition for a variety of reasons[7], including improved efficiency and user satisfaction (Pol et al., 2025, p. 11), achieving transparency and interoperability (Mergel et al., 2019), among others. As a state, however, they also have a self-preservation directive that dictates retaining power. In other words, states must ensure their relevance and their authority in order to remain "alive", in the Hobbesian sense (Heller, 1980). Digitalisation of public administration can be understood as a way to maintain relevance and authority in a changing socioeconomic landscape.

Whatever the reasons a government has for pursuing a digital transition, underlying myths or narratives help inspire collective action[8]. Analysing those myths shows how the government frames the digitalisation. Bekkers & Homburg (2007) identify four narratives of e-government: 1) a new and better government, 2) technological progress and instrumentality, 3) rational information planning and 4) the citizen as an empowered customer. My own work with Samuel Peach at the University of Tartu identified a fifth narrative especially relevant in emergent economies like Kazakhstan: 5) the international status associated with technology.

Considering that the narratives are framed positively, this suggests that states tend to adopt the hegemonic discourse for their own interests rather than actively oppose it. In the sphere of the digital transition, even when resisting digital colonialism, this appears as *digital sovereignty* rather than *digital anti-colonialism* or *decolonialism*. As such, it focuses on dependency rather than hegemony[9]. The state's impulse to maintain authority and sovereignty over its subjects (Heller, 1980) motivates a reduction in dependency.

Along the same lines, autarchy allows the conduct of a less constrained foreign policy. For this reason, organisations like the BRICS have pursued digital sovereignty, a state-centric understanding that grants the state legitimate control over digital infrastructures and data (Jiang & Belli, 2025), especially defined against foreign – mainly US – influence.

Such narrative contrasts with early and liberal understandings of the cyberspace, which depicted it as decentralised and not susceptible to fall under the control of a state due to its complexity. Both Russia and China are early proponents of digital sovereignty, and while their concepts were dismissed as a means of surveilling their citizens, the recent use of the US digital monopoly as a geoeconomic weapon has triggered shifts across a range of states. As a result, speaking of digital sovereignty and reduced dependency has become more common.

The Kazakh state, therefore, frames the phenomenon as a dependency problem and has taken steps to tackle this dimension. This framing is not unique to Kazakhstan but stems from the nature and drivers of the state as a political structure, coupled with our current international system. However, since in the case of Kazakhstan the imperial centre has historically been Russia, not the Western empires, the dependency is framed mainly vis-à-vis Russia, and the international structure – mainly favourable to the West – is not challenged. This constitutes a key difference between Kazakhstan and de-Westernising (Mignolo, 2023) states like the BRICS. Kazakhstan does not

[7] Corporations also push for digitalisation, but their drivers are clearer: reduce costs, improve profits, expand to new markets, extract value.

[8] Myths or narratives should not be understood as inherently fake, but rather as discourses that drive collective action.

[9] Refer to figure 6.

reject Western structures; rather, it welcomes them as a counterbalance to Russian influence, particularly after the pivotal year of 2022.

Kazakhstan also addresses the issue of digital dependency at the highest level. The president of the Republic of Kazakhstan, Kassym-Jomart Tokayev, has defined the goal of transforming the country into a regional digital hub (Beklemishev et al, 2023). As well as providing digital autarchy, protecting national data and communications, it would provide an alternative for Central Asia, currently dependent on Russian upstreams and infrastructure. After 2022, reducing reliance on Russia – as well as decolonisation efforts, such as reviving national languages – has gained traction in ex-Soviet countries.

This is the driver for the project of the Trans-Caspian Fibre Optic Cable, which is planned to span 380 kilometres across the Caspian Sea and connect Aktau, in Kazakhstan, with Sumgait, in Azerbaijan. The operators would be Azertelecom and Kazakhtelecom, and it would allow to route the traffic from Kazakhstan –and from other countries in Asia– to Europe via the South Caucasus, avoiding the path through Russia. As a result, Kazakhstan declares that the cable is in the common interest of the Central Asian region (Beklemishev et al, 2023, p. 19). The following map shows existing undersea cables in the near abroad. The ones under construction appear in grey.



Map 2: Section of the Submarine Cable Map. Source: TeleGeography. Available at: https://www.submarinecablemap.com

Consequently, the terrestrial infrastructure of fibre-optic cables is also being rerouted to Aktau. Refer to the following map showing the terrestrial fibre-optic infrastructure. Note the border crossing points that route traffic into Russia, and how they are concentrated around Moscow. The segments shown in blue and yellow are under construction. The aim to strengthen the connectivity to Aktau is clearly visible in the map.



Map 3: Section of the Broad Band Map. Source: International Telecommunications Union. Available at: https://bbmaps.itu.int/bbmaps/

Conclusion and findings

The contemporary wave of digitalisation, which is shaping a wide array of social and economic domains, is driven by the interests of powerful international corporations backed by imperial-minded states. As such, the logics and structures imported by subaltern countries have the potential to replicate old colonial dynamics and set in place new ones.

The danger of digitalisation in its current form is widely overlooked, partly because it is seen as a neutral force of innovation and partly because it has articulated a hegemonic narrative. As per Antonio Gramsci's theory on hegemony, whenever the values of the dominant social class have been socialised, they are also adopted and defended by the subaltern classes –even when it is actively detrimental to them.

Dealing with digital colonialism, subaltern states have not explicitly challenged its colonial nature, but rather focused on the dependency and constraints it imposes. Early proponents of establishing sovereignty in the cyberspace are Russia and China, as well as anti-establishment states like those in the BRICS. However, the renewed imperial ambitions of the second Trump administration have led to the discussion of technological autarchy even in core states.

Kazakhstan emerges as a very important and unique case study. Gaining independence after the fall of the Soviet Union, it is a state of recent formation, but it has pursued an ambitious state-led digitalisation that has transformed its landscape. It is also at the crossroads of three technological superpowers, whose corporations push for expansion and influence: Russia, China, and the West. These three influence Kazakhstan's digitalisation in different ways, to be the topic of further studies.

The Soviet era legacies have made Kazakhstan dependent on Russian upstreams and cables to reach the global internet. This vulnerability could enable foreign intervention and surveillance on the critical data that managing a digital public administration requires. Therefore, Kazakhstan aspires to position itself as a digital hub in the region, reducing its dependency on Russia, achieving autarchy, and exerting influence in Central Asia. A clear example is the Trans-Caspian Fibre Optic Cable project, which would bypass Russian cables and establish an alternative internet traffic route between Asia and Europe.

In sum, countries like Kazakhstan are taking steps to reduce reliance on foreign transit routes that pose security concerns as they build a digital society and an online public administration. Both of these transformations require control over national data, particularly in a time when the asymmetrical interdependence characteristic of the post-Cold War globalisation has been exploited as a geoeconomic weapon in a volatile international system.

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The Effects of Manipulated Online Reviews on Purchase Intentions: A Consumer Perception Perspective

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Abstract

Online reviews have become one of the most influential sources of information in digital purchasing environments. However, the growing prevalence of manipulated reviews poses significant challenges for consumer trust and decision-making. This study examines how perceived manipulation of online reviews affects purchase intention, with consumer trust proposed as the mediating mechanism. Grounded in signaling theory and information asymmetry theory, the research adopts a quantitative, cross-sectional survey design. Data were collected from 178 adult consumers in Kazakhstan through a bilingual (English and Russian) online questionnaire. Preliminary descriptive analysis of 177 valid responses reveals that respondents demonstrate moderate awareness of review manipulation (M = 3.32) alongside continued, though cautious, reliance on online reviews. Further hypothesis testing using mediation analysis (PROCESS macro, Model 4) will assess whether consumer trust mediates the negative relationship between perceived manipulation and purchase intention. The study contributes to the literature on digital trust and eWOM in an emerging market context.

Keywords: *online reviews, perceived manipulation, consumer trust, purchase intention, eWOM, Kazakhstan*

1. Introduction and Background

In the digital economy, online reviews have become one of the most influential mechanisms shaping consumer trust and purchase decisions. As consumers increasingly rely on other users' experiences to navigate online purchasing environments, reviews function as a powerful form of electronic word-of-mouth (eWOM) — often perceived as more credible than company-generated content precisely because they originate from other buyers (Cheung & Thadani, 2012; Fernandes et al., 2022).

At the same time, the rapid expansion of e-commerce has intensified the problem of review manipulation. Fake positive reviews, suppressed negative comments, and exaggerated claims are now widely documented across platforms (Luca & Zervas, 2016; Munzel, 2016). These practices distort the informational environment that consumers depend on and raise fundamental questions about the reliability of user-generated content.

This paper examines the effects of perceived manipulation of online reviews on consumer purchase intention, with particular attention to the mediating role of consumer trust. The study is grounded in signaling theory (Spence, 1973) and information asymmetry theory (Akerlof, 1970), and draws on survey data collected from 178 consumers in Kazakhstan — an emerging market context that remains underrepresented in the online review literature. The research addresses three hypotheses:

H1: Perceived manipulation of online reviews negatively affects consumer trust.

H2: Consumer trust positively affects purchase intention.

H3: Consumer trust mediates the relationship between perceived manipulation and purchase intention.

2. Literature Review and Theoretical Framework

2.1 Online Reviews, eWOM, and Consumer Behavior

A substantial body of research demonstrates that online reviews influence consumer attitudes, product evaluations, and purchase intentions. Review valence, volume, credibility, and relevance have all been shown to shape how consumers interpret product information (Jalilvand & Samiei, 2012; Park et al., 2007; Li et al., 2020). Ismagilova et al. (2020) conducted a meta-analysis of 69 studies and found that eWOM usefulness, trust in message, and credibility are among the strongest predictors of purchase intention — with review volume being less reliable as a standalone predictor.

In online environments, consumers cannot physically evaluate products before purchase. Reviews therefore serve as a substitute for direct experience, reducing uncertainty and supporting decision-making. As Filieri (2015) notes, reviews are adopted when they are perceived as diagnostic and helpful.

2.2 Theoretical Foundations

This study is grounded in two complementary theories. Signaling theory (Spence, 1973) explains how one party communicates credible information to another under uncertainty. In e-commerce, reviews function as signals of product quality and seller reliability. However, a signal is only useful if it is believed to be credible. When consumers suspect that reviews are manipulated, the signaling value collapses, increasing rather than reducing uncertainty.

Information asymmetry theory (Akerlof, 1970) adds a market-level perspective. In online transactions, sellers know more than buyers about true product quality. Reviews help reduce this asymmetry — but only when they are trusted. Manipulated reviews reinforce asymmetry by replacing genuine information with deceptive signals, weakening consumer confidence and market efficiency (Ba & Pavlou, 2002).

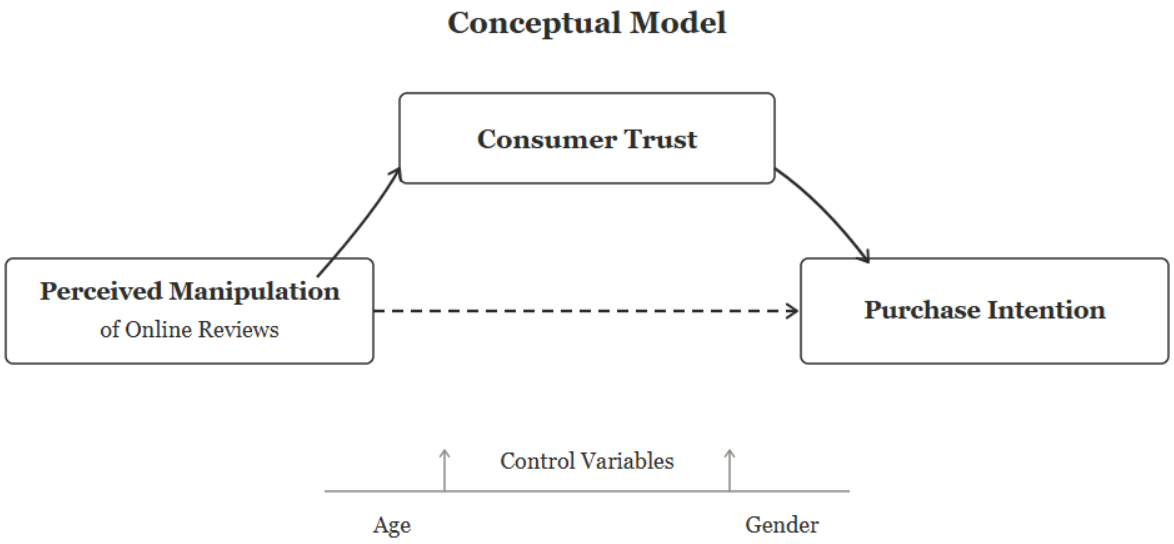
2.3 Perceived Manipulation, Trust, and Purchase Intention

Perceived manipulation refers to the consumer's belief that online reviews may be intentionally distorted, fabricated, exaggerated, or strategically managed. Held (2018) emphasizes that subjective perception of deception — even without objective proof — has meaningful behavioral consequences. Munzel (2016) shows that consumers actively use contextual cues to identify potentially fake reviews, and Zhong et al. (2023) demonstrate that purchase-related judgments differ significantly when manipulation is perceived.

Consumer trust — defined here as confidence in the honesty, reliability, and credibility of online review information — is proposed as the key mediating mechanism. When manipulation is suspected, trust declines. Lower trust, in turn, reduces the consumer's willingness to rely on reviews and to proceed with a purchase (Filieri et al., 2021; Ba & Pavlou, 2002). This mediation logic identifies why manipulated reviews are harmful: not merely because they exist, but because they damage the psychological foundation on which purchase decisions are built.

3. Conceptual Model

Based on the theoretical framework and reviewed literature, the study proposes the following mediation model:



Review attributes — credibility cues, volume, language, and relevance — are treated as contextual factors that shape how consumers come to perceive manipulation and evaluate review environments, rather than as central constructs in the mediation model (Ismagilova et al., 2020).

4. Methodology

The study adopts a post-positivist, deductive, and quantitative approach, consistent with the research design described by Creswell and Creswell (2018) and Saunders et al. (2019). A cross-sectional online survey was administered via Google Forms in English and Russian to adult consumers in Kazakhstan with prior experience reading online reviews before purchase decisions.

The final sample consisted of 178 valid responses (177 included in analysis after data cleaning), collected through convenience sampling via social media and professional networks. The sample is predominantly young: 56 respondents aged 18–24, 68 aged 25–34, and 33 aged 35–44, with a female majority (approximately 63%). Responses were split between Russian (114) and English (63) versions of the questionnaire.

All main constructs were measured using five-point Likert scales adapted from established literature. Perceived Manipulation was operationalized through six items reflecting beliefs about intentional distortion, fabrication, and suppression of reviews (Munzel, 2016; Zhong et al., 2023). Consumer Trust was measured through four items capturing perceived honesty, reliability, and confidence in online reviews (Filieri et al., 2021; Lim & Van Der Heide, 2015). Purchase Intention was measured through six items assessing willingness to buy, decision confidence, and behavioral intentions influenced by reviews (Fernandes et al., 2022; Hsu et al., 2017).

Data analysis was conducted using SPSS and the PROCESS macro (Hayes, 2020). The analytical strategy comprised four procedures: (1) descriptive analysis to summarize respondent characteristics and construct means; (2) reliability testing using Cronbach's alpha to assess internal consistency of each scale; (3) validity assessment through exploratory factor analysis to confirm construct structure; and (4) mediation analysis using PROCESS macro Version 4 (Hayes, 2020), Model 4, with 5,000 bootstrap resamples to test whether consumer trust mediates the relationship between perceived manipulation and purchase intention.

5. Preliminary Findings

5.1 Descriptive Statistics

Preliminary descriptive analysis of the 177 valid responses reveals several notable patterns. Table 1 summarizes composite means and standard deviations for each construct.

Table 1. Descriptive Statistics by Construct

Construct	Items	M	SD
Perceived Manipulation	6	3.32	1.17
Consumer Trust (mediator)	4	3.23	1.11
Purchase Intention	6	3.44	1.15
Review Credibility	3	3.63	1.24
Review Volume	3	3.61	1.25
Review Language	3	3.43	1.19
Review Relevance	3	3.47	1.24

Note. Scale: 1 = Strongly disagree, 5 = Strongly agree.

5.2 Key Observations

Several patterns emerge from the preliminary data. First, consumers demonstrate a moderate but meaningful level of perceived manipulation awareness (M = 3.32, SD = 1.17). The item 'I believe that many online reviews are intentionally manipulated' recorded the lowest mean within this construct (M = 3.02), yet with the highest variance (SD = 1.35), suggesting considerable individual differences in manipulation sensitivity.

Second, consumer trust in online reviews — the proposed mediator — scored lower than all review attribute constructs (M = 3.23), reflecting cautious reliance rather than strong confidence. The lowest trust item was 'I consider online reviews to be a reliable source of information' (M = 3.14), while 'I generally trust online reviews when making purchase decisions' scored slightly higher (M = 3.44).

Third, consumers rate review credibility cues (M = 3.63) and volume (M = 3.61) as more important signals than language (M = 3.43) or relevance (M = 3.47). Notably, 'I trust online reviews more when they provide balanced rather than one-sided opinions' recorded the highest item-level mean across the entire questionnaire (M = 3.73), suggesting that balance is a key credibility signal for this sample.

Fourth, a pattern consistent with a 'trust paradox' is observable: respondents suspect manipulation (M = 3.32) and report reduced trust (M = 3.23), yet maintain moderate purchase intentions (M = 3.44). This gap between suspicion and continued behavioral engagement supports the importance of examining the mediating mechanism rather than assuming a simple direct effect.

Key finding for discussion: Consumers in this sample are aware of review manipulation and show reduced trust as a result — yet purchase intention remains at a moderate level. This suggests that trust functions as a buffer, and that its erosion may have progressive rather than immediate effects on purchase behavior.

Further analysis — including reliability (Cronbach's alpha), correlation analysis, and mediation testing via PROCESS Model 4 — will be presented in the full thesis (Chapter 4) to formally test H1, H2, and H3.

6. Discussion and Contribution

This study makes several contributions. Theoretically, it extends signaling theory and information asymmetry theory to the specific context of manipulated online reviews in an emerging market setting. By centering the consumer's subjective perception rather than the objective classification of reviews as fake or authentic, it aligns with the growing consumer-centered perspective in deception research (Held, 2018; Zhong et al., 2023).

The proposed mediation model — in which perceived manipulation reduces consumer trust, which in turn weakens purchase intention — adds conceptual precision to the literature by identifying the mechanism behind the behavioral outcome. This is important because, as the preliminary data suggest, awareness of manipulation does not immediately neutralize purchase intent. Rather, its effect appears to operate through the erosion of trust.

The Kazakhstan context also adds value to a literature that has been largely dominated by findings from developed or large emerging markets (Phamthi et al., 2024). As digital commerce expands in Central Asia, understanding how local consumers interpret and respond to review manipulation is increasingly relevant for both researchers and practitioners.

Practically, the findings may inform e-commerce platforms, online sellers, and consumer protection policymakers. If perceived manipulation erodes trust in review systems, businesses have strong incentives to invest in review transparency, verification mechanisms, and credibility signals — particularly in markets where institutional trust in digital platforms may still be developing.

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Constructing a Cross-border Railway Transport Insurance System for Xinjiang in the Context of the China Railway Express

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Abstract

The China Railway Express (CRE) has emerged as a pivotal transportation corridor for economic and trade exchanges across the Eurasian continent under the Belt and Road Initiative. As the core area of the Silk Road Economic Belt, Xinjiang serves as the primary gateway for the western route of CRE. However, the absence of a comprehensive cross-border railway transport insurance system has become a critical constraint on the high-quality development of CRE. Drawing on risk management theory, information asymmetry theory, and institutional economics, this study employs a mixed-methods approach combining Analytic Hierarchy Process (AHP), Logistic regression analysis, and comparative international case studies. It systematically assesses the cross-border transport risks along the Xinjiang corridor of CRE and empirically examines the determinants of insurance demand. The findings reveal that operational risks-particularly cargo damage during transshipment and gauge change-carry the highest weight. Cargo value, risk perception, and product accessibility are identified as the core factors influencing insurance purchasing decisions, with insufficient insurance supply constituting the primary institutional bottleneck suppressing effective demand. Drawing on international experiences, this paper proposes a comprehensive four-dimensional insurance framework tailored to the operational characteristics of CRE in Xinjiang, encompassing insurance product systems, service networks, reinsurance mechanisms, and cross-border regulatory coordination. Corresponding policy recommendations are also provided.

KEYWORDS: China Railway Express (CRE); Cross-border Railway Transport; Insurance System; Silk Road Economic Belt

1 INTRODUCTION

Since the launch of the Belt and Road Initiative in 2013, the China Railway Express (CRE) has achieved leapfrog development as a strategic international transport corridor connecting the Eurasian continent. According to statistics from China State Railway Group, the cumulative number of CRE trips has exceeded 90,000, reaching over 200 cities in 25 European countries, with transported goods covering more than fifty categories including electronic products, electromechanical equipment, complete vehicles, and daily necessities(Choi 2021). The Xinjiang Uygur Autonomous Region, designated as the core area of the Silk Road Economic Belt by the Chinese government, leverages the geographical advantages of the two major land ports-

Alashankou and Horgos-to handle over seventy percent of the westward CRE transit volume, making it one of the most critical hubs in the CRE network(Gao Zhigang et al. 2021). Therefore, promoting the development of cross-border railway transport in Xinjiang helps reduce comprehensive transportation costs and market access barriers, facilitates China's exports to Europe and Central Asia, and fosters mutually beneficial economic and trade cooperation among Eurasian countries(Liu Bin et al. 2022).

However, the contradiction between the rapid development of CRE and the provision of cross-border transport insurance has become increasingly pronounced. On the one hand, CRE faces diverse risks, including long and complex transport routes(Wang Gengjie 2022), involvement of multiple countries susceptible to geopolitical intervention(Wu Wen et al. 2025), and intertwined issues of insufficient financing capacity and debt risks(Zhang Ling et al. 2025). On the other hand, problems such as insufficient supply of cross-border railway transport insurance products(Lei Dengqi 2025), low insurance coverage rates(Feng Fenling et al. 2024), and inefficient cross-border claims settlement mechanisms(Guo Yidan et al. 2022) persist. According to survey data from the Insurance Association of China, the insurance uptake rate for CRE cargo transport is less than 40%, far below the over 90% coverage level of international maritime insurance. The absence of a robust insurance system not only increases the operational risks for trading and transport enterprises but also constrains the enhancement of trade facilitation through CRE.

Existing research on cross-border transport insurance has primarily focused on the maritime cargo insurance field. Eun-Sup Lee(2000) analyzed the impact of the Hamburg Rules on the legal framework of marine insurance, while Socorro Trujillo Karina(2019) focused on the language and standard-setting in international marine insurance. In recent years, some scholars have begun to address obstacles to cross-border railway development(Bouraima et al. 2026) and risk-sharing mechanisms at logistics centers(Lee et al. 2022). However, research specifically targeting a cross-border railway transport insurance system for the Xinjiang corridor of CRE remains insufficient. Existing studies either focus on analyzing single risk factors or discuss the opportunities and challenges for the insurance industry in serving the Belt and Road Initiative from a macro perspective. There is a lack of systematic research integrating risk identification, demand assessment, and system construction, particularly an in-depth analysis of the unique operational environment and risk structure of the Xinjiang corridor.

Based on this, this paper addresses the core question: How can a systematic and operable cross-border railway transport insurance system be constructed to adapt to the operational characteristics and risk structure of the Xinjiang CRE corridor and effectively support the development of the Silk Road Economic Belt core area? This study will comprehensively apply risk management theory, information asymmetry theory, and institutional economics theory, conducting empirical testing and international comparisons to construct an insurance system framework adapted to the operational characteristics of cross-border railway transport in Xinjiang. The research findings can provide references for the institutional design of insurance regulatory

authorities, product innovation by insurance institutions, and the improvement of financial and trade services in the Xinjiang-Central Asia region.

2 THEORETICAL ANALYSIS AND RESEARCH METHODS

2.1 Theoretical Analysis

The theoretical analysis of this paper is built upon three pillars: risk management theory, information asymmetry theory, and institutional economics theory. These three perspectives provide an analytical foundation for constructing a cross-border railway transport insurance system, addressing respectively the logic of risk disposal, market operation mechanisms, and institutional supply.

According to the classical framework of risk management, any systematic risk response must undergo three stages: identification, assessment, and treatment, with insurance serving as a key tool for risk transfer. The transport risks faced by the Xinjiang corridor of the China Railway Express (CRE) are characterized by significant cross-border nature, multi-source origins, and chain transmissibility. These features render singular risk prevention and control measures ineffective, necessitating a reliance on a systematic insurance regime to achieve risk diversification across the entire chain. Information asymmetry theory reveals the internal mechanism of market failure in cross-border transport insurance. The classical model of Rothschild and Stiglitz (1976) points out that adverse selection and moral hazard in insurance markets can lead to deviations from optimal market equilibrium. In the cross-border railway transport insurance market, information asymmetry is particularly pronounced: insurers struggle to accurately assess transport risks spanning multiple countries; insured parties face moral hazard incentives regarding loss prevention and mitigation; coupled with time lags and distortions in cross-border information transmission, insurers' underwriting and pricing capabilities are severely undermined. The result is conservative market supply--a narrow range of insurance products, persistently high premium rates, and suppressed effective demand. Institutional economics theory further explains the underlying causes of the absence of insurance protection from the perspectives of institutional supply and transaction costs. North (1990) emphasizes that institutions are the rule systems constraining human behavior, and institutional change is a key factor in economic development. Cross-border railway transport insurance involves the legal systems, regulatory standards, and commercial practices of multiple countries, and its effective operation highly depends on the coordination of national institutions. The current lack of mutual recognition mechanisms in insurance regulation between the two major convention systems--COTIF/CIM and SMGS--along with the high costs of cross-border claims execution, creates significant institutional transaction costs that hinder the development of the insurance market.

Synthesizing the above theories, this paper constructs a four-stage analytical framework: "risk identification--demand assessment--supply diagnosis--system construction." In the risk identification stage, the Analytic Hierarchy Process (AHP) is employed to systematically assess and rank the multiple risks of cross-border railway transport. In the demand assessment stage,

questionnaire surveys and Logistic regression models are used to analyze the intensity and influencing factors of enterprises' demand for cross-border transport insurance. In the supply diagnosis stage, the shortcomings of existing insurance supply are analyzed from three dimensions: institutional environment, product system, and service capacity. In the system construction stage, drawing on international experience, a safeguard system encompassing products, services, risk diversification, and regulatory coordination is designed.

2.2 Research Methods and Data Sources

This study employs a combination of multiple research methods to ensure systematic processes and the reliability of its conclusions. First, a literature review method is adopted to systematically examine the theoretical foundations and research progress in the field of cross-border transport insurance, providing theoretical support for subsequent analyses. Second, the Analytic Hierarchy Process (AHP) is used to quantitatively assess the cross-border transport risks along the Xinjiang Corridor of the China Railway Express (CRE), identifying key risk factors and their respective weights. Third, a Logistic regression model is applied to empirically test the factors influencing enterprises' insurance purchase decisions, revealing key demand-side drivers. In addition, a comparative analysis method is employed to draw lessons from the cross-border transport insurance systems of developed economies such as the European Union and North America, while an institutional analysis method is used to design an insurance protection system framework tailored to the Xinjiang Corridor.

The data required for this study are derived from the following sources: statistical data from China State Railway Group Co., Ltd., Urumqi Customs, and the China Railway Express (CRE) website; industry data from the Insurance Association of China; and questionnaire surveys and in-depth interviews conducted from June to September 2025 with logistics enterprises, trading companies, and insurance institutions in Urumqi, Alashankou, and Horgos.

3 ANALYSIS OF THE OPERATIONAL STATUS AND RISKS OF THE XINJIANG CRE CORRIDOR

3.1 Operational Status

Xinjiang serves as the core area of the western route of the China Railway Express (CRE), with Alashankou and Horgos being the two most concentrated land ports for CRE entry and exit. In recent years, the number of CRE trains passing through Xinjiang ports has continued to grow, establishing it as one of the busiest railway freight corridors on the Eurasian Land Bridge.

Regarding cargo composition, goods transported via the Xinjiang corridor have expanded from initially mainly electronic products such as laptops and printers to now encompass over fifty categories, including automobiles and parts, photovoltaic components, daily necessities, textiles and garments, food and beverages, and medical devices. Among these, automobiles and parts have

seen significant growth in recent years, accounting for over 18% of the export value by 2024. Return trains primarily carry agricultural products, mineral resources, timber, and chemical products, indicating a gradual improvement in the balance of two-way transport. Concerning port distribution, Alashankou Port, as the longest-operating land port, handles approximately 60% of the CRE transit volume. Horgos Port, since its official opening as a railway port in 2016, has grown rapidly and now shares about 40% of the transit volume. The two ports have formed a dual-hub pattern with complementary functions.

Table 1: Overview of CRE Operations along the Xinjiang Corridor (2020-2025)

Year	Alashankou			Horgos		
	Number of Trains	Year-on-Year (%)	Cargo Transported (10,000 TEU)	Number of Trains	Year-on-Year (%)	Cargo Transported (10,000 TEU)
2020	4247	-	40.3	2041	-	19.4
2021	4939	16.3	46.9	2710	32.8	25.9
2022	5141	4.1	49.9	3150	16.2	30.0
2023	5040	-2.0	54.9	3238	2.8	34.1
2024	6797	34.9	74.7	3370	4.1	35.7
2025	6622	-2.6	68.7	3075	-8.8	31.9

Source: Compiled from China Railway Express (CRE) website, China State Railway Group, etc.

3.2 Cross-border Railway Transport Risk Identification and AHP Assessment

Based on literature analysis and field research, this paper categorizes the cross-border transport risks faced by the Xinjiang CRE corridor into five major categories and fourteen specific risk factors (Li Yanli et al. 2024) The Analytic Hierarchy Process (AHP) was employed to calculate weights (Gao Haitao et al. 2018). Experts from insurance companies, logistics enterprises, railway transport departments, and universities were invited to conduct pairwise comparisons using the Saaty 1-9 scale, constructing judgment matrices and testing for consistency. All judgment matrices had CR values less than 0.1, passing the consistency test. The assessment results are shown in Table 2.

Table 2: AHP Assessment Results of Cross-border Railway Transport Risks on the Xinjiang CRE Corridor

First-Level Indicator (Weight)	Second-Level Indicator	Local Weight	Comprehensive Weight	Rank
Natural Environment Risk（0.143）	Extreme Climate Disasters	0.625	0.089	3
	Geological Disasters	0.375	0.054	12
Transport Operation Risk（0.278）	Cargo Damage during Gauge Change/Transshipment	0.467	0.130	1
	Improper Loading and Securing	0.277	0.077	5
	Temperature Control Failure	0.256	0.071	7

Political and Legal Risk（0.239）	Policy and Sanctions Risk	0.413	0.099	2
	Legal Conflict Risk	0.327	0.078	4
	Customs Clearance Risk	0.260	0.062	9
Economic and Credit Risk（0.198）	Exchange Rate Fluctuation	0.352	0.070	8
	Trading Partner Default	0.368	0.073	6
	Losses from Transport Delays	0.280	0.055	11
Information Technology Risk（0.142）	Poor Information System Connectivity	0.413	0.059	10
	Weak Cargo Tracking and Monitoring	0.327	0.046	13
	Insufficient Legal Validity of Electronic Documents	0.260	0.037	14

Note: Comprehensive Weight = First-Level Indicator Weight * Local Weight; Ranking is based on comprehensive weight in descending order.

The assessment results indicate that transport operation risk is the most significant risk category, with cargo damage during gauge change/transshipment ranking first among all risk factors. This is highly consistent with the operational characteristic of CRE requiring a gauge change (China's standard gauge of 1,435 mm versus the CIS countries' broad gauge of 1,520 mm) at the China-Kazakhstan border. Political and legal risk ranks second, reflecting the policy uncertainties and differences in legal systems faced by CRE as it traverses multiple countries. Economic and credit risk ranks third, with trading partner default and exchange rate fluctuations being the main risk factors. While the weights of natural environment risk and information technology risk are relatively lower, extreme climate disasters can cause significant losses in individual risk events and should not be overlooked.

4 ANALYSIS OF ISSUES IN XINJIANG'S CROSS-BORDER RAILWAY TRANSPORT INSURANCE PROTECTION

4.1 Institutional Environment Analysis

The institutional environment for China's cross-border railway transport insurance faces triple constraints, stemming from domestic legislation, international rules, and policy support. At the domestic legal level, while the "Insurance Law of the People's Republic of China" provides general provisions for property insurance contracts, it lacks specific clauses addressing cross-border transport insurance, leaving issues such as cross-border insurance services and the cross-border validity of electronic policies unclear. The "Railway Law of the People's Republic of China" focuses primarily on domestic railway transport management, with minimal reference to insurance arrangements for international rail through transport.

At the international convention level, a dualistic structure exists between the COTIF/CIM system and the SMGS system. CRE trains apply the SMGS Agreement when departing from China and traversing CIS countries such as Kazakhstan and Russia, and adopt the COTIF/CIM rules upon

entering EU member states. These two convention systems exhibit significant differences in carrier liability limits, damage compensation calculation standards, and statutes of limitations, leading to difficulties in defining insurance liability. Although a cooperation agreement signed between OSJD and OTIF in 2006 attempted to bridge these two major convention systems, the promotion of the unified consignment note (CIM/SMGS) has been slow, making institutional alignment a persistent major obstacle in cross-border transport insurance design. At the policy support level, while the state has issued documents such as the "Several Opinions on Accelerating the Development of the Modern Insurance Service Industry" to encourage the insurance sector to serve the Belt and Road construction, targeted policy support specifically for CRE cross-border transport insurance remains insufficient. Substantive incentive measures such as premium subsidies and tax incentives have yet to be implemented, making it difficult to effectively mobilize the initiative of market participants.

4.2 Analysis of the Current State of Insurance Supply

Surveys of property insurance companies in the Xinjiang region indicate that the insurance products currently available in the market for CRE-related entities are predominantly traditional domestic cargo transport insurance, with genuinely dedicated products designed specifically for cross-border railway transport scenarios being relatively scarce.

Table 3: Overview of Cross-border Railway Transport Insurance Product Supply in Xinjiang

Product Type	Coverage Scope	Premium Rate Level (‰)	Main Deficiencies
Domestic Cargo Insurance and Extension Clauses	Domestic, port transshipment, and overseas connectivity, etc.	0.3-0.8	Lack of standardization
Import/Export Cargo Insurance	Warehouse-to-warehouse, full coverage	0.4-1.0	Lengthy loss adjustment period
Carrier's Liability Insurance	Carrier's statutory liability	0.1-0.5	Low liability limits
Logistics Liability Insurance	Full logistics chain liability	0.3-1.0	Ambiguity in liability definition
Transport Delay Insurance	Delays exceeding an agreed number of days	Negotiated pricing	Low level of awareness

Source: Compiled from surveys of property insurance companies in the Xinjiang region.

As shown in Table 3, the following issues exist in the supply of insurance products: First, there is a lack of product standardization. Domestic cargo insurance and its extension clauses lack unified terms, while carrier's liability insurance limits are too low to match the actual risk exposure of cross-border transport. Second, claims efficiency is low. Import/export cargo insurance has a lengthy loss adjustment cycle, and the low awareness of transport delay insurance limits the accessibility and satisfaction of insurance services. Third, liability definitions are ambiguous. Logistics liability insurance suffers from unclear attribution of liability for cross-border segments,

increasing the risk of claims disputes. The above analysis of the current insurance supply illustrates a structural mismatch between the existing insurance supply system and the demands of cross-border railway transport.

4.3 Empirical Analysis of Insurance Demand

To gain an in-depth understanding of the characteristics and influencing factors of insurance demand, this study conducted a questionnaire survey among logistics and trading enterprises in Urumqi, Alashankou, and Horgos. After excluding invalid responses, 40 valid enterprise questionnaires were obtained. It should be noted that due to the limited sample size, the regression results in this section should be regarded as exploratory findings, and future research may further validate them on the basis of larger samples. A binary Logistic regression model was established with whether an enterprise has purchased cross-border railway transport insurance (1 = insured, 0 = uninsured) as the dependent variable. Six explanatory variables were selected: enterprise scale, average value per cargo consignment, annual transport frequency, risk perception level, premium affordability, and insurance product accessibility. Let the dependent variable Y (whether insured) follow a Bernoulli distribution, P (Y = 1) = p. The Logistic regression model is specified as:

$$\ln\frac{p}{1-p} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \varepsilon \quad (1)$$

Where enterprise scale (X_1) is measured by the natural logarithm of annual operating revenue; average value per consignment (X_2) is measured in 10,000 RMB; annual transport frequency (X_3) is measured in trips per year; premium affordability (X_5) is expressed as the proportion of the premium budget to transport costs; risk perception level (X_4) and insurance product accessibility (X_6) are both measured using a 1-5 point Likert scale. The regression results are shown in Table 4.

Table 4: Logistic Regression Results of Factors Influencing Cross-border Railway Transport Insurance Demand

Variable	Coefficient (B)	Standard Error	Wald Statistic	Significance (P-value)	Exp(B)
X_1	0.847	0.392	4.672	0.031**	2.333
X_2	1.123	0.418	7.213	0.007***	3.074
X_3	0.536	0.287	3.487	0.062*	1.709
X_4	1.356	0.463	8.573	0.003***	3.881
X_5	0.412	0.351	1.378	0.240	1.510
X_6	1.078	0.401	7.228	0.007***	2.939
cons	-8.634	2.876	9.011	0.003***	

Note: *** indicates significance at the 1% level, ** at the 5% level, * at the 10% level. Model Fit Statistics: -2 Log Likelihood = 31.247; Nagelkerke R^2 = 0.584; Hosmer-Lemeshow Test P = 0.637 > 0.05.

According to the test results, the Hosmer-Lemeshow test yields a P-value of 0.637, greater than 0.05, indicating a good model fit. The Nagelkerke R^2 is 0.584, suggesting that the model possesses good explanatory power. Analyzing the regression results in Table 4: The coefficient for average value per consignment is 1.123 and is significant at the 1% level, indicating a strong

positive impact on insurance demand; shippers of high-value goods have a more significant demand for insurance protection, consistent with expectations. The influence of risk perception level is also significant, indicating that the deeper an enterprise's understanding of cross-border transport risks, the stronger its willingness to insure. The coefficient for insurance product accessibility on the insurance decision is 1.078, significant at the 1% level, indicating that the current insufficient supply of insurance products is a crucial factor suppressing the release of effective demand--enterprises are not unwilling to insure, but rather lack suitable insurance products to choose from. Enterprise scale is significant at the 5% level, indicating that larger enterprises are more mature in their risk management capabilities and insurance purchasing decisions. Transport frequency is only marginally significant at the 10% level, suggesting that high-frequency transport enterprises have a certain tendency to insure, but the effect is not robust. The influence of premium affordability is not statistically significant. This may be due to measurement error, or it may be that the current premium rate level for cross-border railway transport insurance is generally within an acceptable range for enterprises, so that premium expenditure has not yet become a major constraint on the insurance decision.

5 International Cross-border Transport Insurance

The European Union has relatively mature institutional construction in the field of cross-border railway transport insurance. Relying on the COTIF/CIM convention system, it has achieved basic unification of railway transport insurance rules within its borders. According to the CIM Uniform Rules, railway carriers assume strict liability for loss of or damage to goods, with a liability limit of 17 Special Drawing Rights (SDR) per kilogram. This clear liability framework provides a stable institutional foundation for insurance product design. At the market level, Lloyd’s of London and the German insurance market have developed a rich array of railway transport insurance products, including two main models: the Door-to-Door Policy and the Sectional Policy. More critically, the EU Freedom of Services Directive allows insurance companies from member states to provide insurance services directly in other member states, eliminating licensing barriers for cross-border insurance operations.

Cross-border transport insurance under the North American Free Trade Area (now USMCA framework) exhibits highly market-oriented characteristics. The U.S. railway transport insurance market is dominated by commercial insurance companies, with a mature product system covering a complete range of products including Shipper’s Interest Insurance, Carrier’s Liability Insurance, and Freight Forwarder’s Liability Insurance. The United States and Canada have effectively reduced institutional barriers to cross-border insurance services through the Mutual Recognition Agreement on insurance regulation, establishing an efficient cross-border claims coordination mechanism. Furthermore, the U.S. insurance industry widely applies technologies such as IoT sensors, GPS tracking, and big data analytics, achieving real-time risk monitoring and dynamic rate adjustments, accumulating rich experience in mitigating information asymmetry.

Compared with European and American countries, railway transport insurance under the SMGS agreement framework in CIS countries is relatively underdeveloped. Although SMGS stipulates stricter liability limits than CIM (40 Swiss francs per kilogram), the development levels of insurance markets vary considerably across countries. Russia's transport insurance market is relatively mature, and Kazakhstan has seen considerable development in recent years, but insurance markets in other Central Asian countries are limited in scale with insufficient product supply. CIS countries primarily rely on the Eurasian Economic Union (EAEU) framework to advance insurance regulatory coordination, but substantive progress has been limited.

International experience demonstrates that the effective operation of cross-border railway transport insurance mainly depends on four institutional conditions: first, unified international transport liability rules are a prerequisite for insurance product design; second, liberalization of cross-border insurance services and regulatory mutual recognition are key to reducing transaction costs; third, insurance products need to be adapted to railway transport characteristics; fourth, information technology tools can effectively alleviate information asymmetry problems, improving risk management efficiency and pricing accuracy.

6 CONSTRUCTION PLAN FOR XINJIANG'S CROSS-BORDER RAILWAY TRANSPORT INSURANCE SYSTEM

Based on the foregoing analysis, this paper proposes an insurance system framework encompassing four dimensions: insurance product systems, insurance service networks, reinsurance and risk diversification mechanisms, and cross-border regulatory coordination mechanisms.

6.1 Insurance Product System

The insurance product system can be divided into three tiers: the basic product tier, the specialized product tier, and the value-added service tier. The basic product tier centers on the "China Railway Express Cross-border Railway Cargo Comprehensive Insurance," adopting an all-risks basis model. It covers the entire transport chain from the consignor's warehouse in China to the destination warehouse in Europe, explicitly addressing the connection of liability coverage at gauge change and transshipment nodes. Concurrently, risks unique to CRE, such as cold chain temperature control failure and transport delays, should be included within the basic coverage scope. Premium rates can be differentiated based on factors such as cargo type, transport route, and seasonal considerations. Simultaneously, carrier liability insurance and multimodal transport logistics liability insurance should be developed, forming a basic protection network covering different entities.

The specialized product tier designs additional insurance types targeting specific risks. These include the Cargo Damage during Gauge Change and Transshipment Rider, specifically covering cargo damage risks during the transshipment process at ports; the Cold Chain Transport

Temperature Deviation Insurance, targeting temperature-sensitive goods such as food and pharmaceuticals; the Political Risk Rider, covering losses caused by policy changes or sanctions in transit countries; and the Transport Delay Loss of Profits Insurance, covering indirect economic losses caused by transport delays. Specialized products serve as extension clauses to the comprehensive insurance, available for the policyholder's independent choice. The value-added service tier revolves around an "insurance and service" integration model, providing value-added services such as risk assessment consultation, transport safety loss prevention solutions, and cross-border legal assistance, achieving an upgrade from mere risk compensation to comprehensive risk management services.

6.2 Insurance Service Network

The domestic service network should establish Urumqi as the regional operations center, setting up insurance service stations at the Alashankou and Horgos ports to provide front-end services such as on-site underwriting, instant policy issuance, and rapid survey and loss adjustment. It is recommended to promote major insurance companies to establish specialized cross-border transport insurance service windows at the ports, achieving information connectivity with customs and railway transport departments.

The construction of the cross-border service network can adopt three paths: first, establishing agency partnerships with insurance institutions in transit countries such as Kazakhstan and Russia to achieve cross-border survey, loss adjustment, and claims assistance; second, leveraging the overseas branches of Chinese insurance institutions to extend service reach; third, joining international insurance service networks to compensate for shortcomings in cross-border service capabilities. A digital service platform serves as the technical support for the service network. It is recommended to develop a blockchain-based cross-border transport insurance information platform, integrating functions such as online insurance application, electronic policy issuance, IoT real-time cargo tracking, smart contract automatic claims settlement, and cross-border document verification. Employing IoT technology enables real-time monitoring of key parameters such as temperature, humidity, vibration, and location during transport, providing objective evidence for claims settlement and accumulating dynamic data for actuarial pricing.

6.3 Reinsurance and Risk Diversification Mechanisms

Regarding commercial reinsurance, a combination of proportional reinsurance and excess-of-loss reinsurance is adopted. For conventional transport risks, proportional reinsurance is used to share risks proportionally between the primary insurer and the reinsurer. For catastrophe and special risks, excess-of-loss reinsurance provides protection for the primary insurer. The selection of reinsurers should face the international market, introducing major reinsurance institutions such as Swiss Re, Munich Re, and China Re. Regarding the cross-border transport risk fund, it is proposed that the government, the insurance industry, and the transport industry jointly establish a "China Railway Express Transport Risk Fund" as a supplement to commercial insurance and

reinsurance. The fund's sources can include central and local fiscal allocations, a certain percentage extracted from premium income, and industry association fees. Its main purposes are: first, providing a safety net for special risks that commercial insurance companies are unwilling to cover; second, providing emergency compensation funds in the event of major transport accidents; third, supporting product research and development and technological innovation in cross-border transport insurance.

6.4 Cross-border Insurance Regulatory Coordination Mechanisms

At the bilateral cooperation level, it is recommended that Chinese financial regulatory authorities sign insurance regulatory cooperation memoranda of understanding (MOUs) with insurance regulatory agencies in key transit countries such as Kazakhstan and Russia. Key areas for cooperation include: conditional mutual recognition or simplified approval of insurance operation qualifications, alignment and coordination of solvency supervision standards, and mechanisms for sharing cross-border insurance information. At the multilateral cooperation level, under frameworks such as the Shanghai Cooperation Organization (SCO) and the Belt and Road Insurance Cooperation Forum, efforts should be made to promote the establishment of a coordination platform for cross-border transport insurance rules, gradually unifying policy clause standards, claims settlement procedure norms, and dispute resolution mechanisms. The long-term goal is to form model clauses for cross-border transport insurance recognized by countries along the Belt and Road, ultimately promoting the connection of the two major convention systems-COTIF/CIM and SMGS-in determining insurance liability. Regarding legal conflict coordination, rules for the applicable law in cross-border transport insurance disputes should be formulated, clarifying the principles for determining the proper law of the insurance contract. Simultaneously, the establishment of alternative dispute resolution (ADR) mechanisms should be promoted, setting up a specialized cross-border transport insurance arbitration center under the SCO framework to provide efficient, low-cost dispute resolution solutions.

7 CONCLUSIONS AND RECOMMENDATION

7.1 Research Conclusions

Against the backdrop of constructing the Silk Road Economic Belt core area, this paper systematically investigates the construction of a cross-border railway transport insurance system for the Xinjiang corridor of the China Railway Express (CRE), drawing the following main conclusions:

First, the cross-border transport risks faced by the Xinjiang CRE corridor exhibit characteristics of multi-source origins, cross-border nature, and chain transmission. The AHP assessment results indicate that transport operation risks carry the highest weight, followed by political and legal risks, and economic and credit risks. This risk structure necessitates that

insurance product design should focus on transport operation risks as the core protection target, while simultaneously addressing additional coverage needs for political and legal risks.

Second, cargo value, risk perception level, and insurance product accessibility are identified as the three key factors influencing insurance purchasing decisions. Insufficient supply of insurance products constitutes the primary institutional factor suppressing the release of effective demand, rather than enterprises' inability to afford premiums. This finding implies that the key to expanding insurance coverage lies in increasing the supply of adapted products, rather than simply lowering premium rates.

Third, unified transport liability rules, liberalization of cross-border insurance services, regulatory mutual recognition mechanisms, and information technology applications are common features of cross-border transport insurance systems in developed economies, offering important reference value for China.

7.2 Policy Recommendations

(1) Improve Laws, Regulations, and Institutional Supply. At the domestic legislative level, promote the addition of specialized provisions for cross-border insurance services during the revision of the "Insurance Law," clarifying the legal validity of electronic policies in cross-border transport. In the revision of the "Railway Law," add guiding clauses concerning insurance arrangements for international rail through transport. At the international convention level, actively participate in the coordination process between OSJD and OTIF, promoting the comprehensive adoption of the CIM/SMGS unified consignment note to lay an institutional foundation for unified insurance product design. At the policy level, issue specialized policies supporting CRE cross-border transport insurance, specifying incentive measures such as financial subsidies and tax preferences.

(2) Cultivate the Insurance Market and Promote Product Innovation. Insurance regulatory authorities should establish a green channel for CRE insurance product approval, lowering market entry barriers for innovative products. Support industry associations in taking the lead to formulate model clauses for cross-border transport insurance, providing standardized references for product development. Promote the establishment of a cross-border transport insurance risk data sharing platform, encouraging insurance institutions, railway transport enterprises, and customs authorities to share anonymized data.

(3) Strengthen Cross-border Insurance Cooperation. At the governmental level, the National Financial Regulatory Administration should take the lead, utilizing existing mechanisms such as the China-Kazakhstan and China-Russia intergovernmental cooperation committees, to incorporate cross-border transport insurance regulatory cooperation onto the agenda, progressively advancing the signing of insurance regulatory MOUs. At the market level, encourage insurance institutions to expand cross-border service networks by establishing overseas branches, taking equity stakes in insurance companies along the route, and building reinsurance partnerships. Support China Re in

actively expanding CRE transport reinsurance business to enhance China's voice in risk diversification.

(4) Leverage Xinjiang’s Core Area Role for Pilot Initiatives. As the Silk Road Economic Belt core area and a free trade pilot zone, Xinjiang should play a pioneering role in institutional innovation for cross-border transport insurance. Specific recommendations include: establishing a cross-border transport insurance innovation pilot zone within the Xinjiang Pilot Free Trade Zone framework, exploring reform measures such as relaxing cross-border insurance service access and facilitating participation by foreign-invested insurance institutions; leveraging Urumqi’s locational advantages to build an insurance service center oriented towards Central Asia and Europe, attracting agglomeration of insurance institutions, reinsurance companies, and insurtech enterprises; piloting cross-border insurance service stations and digital insurance platforms at Alashankou and Horgos ports, accumulating experience for nationwide promotion; and seeking to include CRE cross-border transport insurance as a key supported project for financial innovation in the Xinjiang Pilot Free Trade Zone, securing special central fiscal subsidies and tax incentives.

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The Impact of Inflation on Unemployment in Kazakhstan

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ABSTRACT

This paper examines the relationship between inflation and unemployment in Kazakhstan within the framework of macroeconomic theory. While the traditional Phillips Curve suggests a negative relationship between inflation and unemployment in the short run, empirical evidence for emerging economies remains mixed. Kazakhstan represents an important case, as it has experienced inflation volatility, exchange rate fluctuations, and relatively stable unemployment levels over the past decades.

This study addresses this issue by applying an improved Ordinary Least Squares (OLS) model to annual time-series data for Kazakhstan. The model incorporates both current and lagged inflation, as well as key control variables, including GDP growth and the policy interest rate. The inclusion of lagged inflation allows for capturing delayed effects of price dynamics on labor market outcomes, which is particularly relevant in economies where adjustment mechanisms are not immediate.

The expected findings suggest that inflation alone does not significantly explain unemployment in Kazakhstan. However, when incorporating lagged inflation and macroeconomic controls, the model is expected to reveal a more nuanced relationship. In particular, GDP growth is anticipated to have a negative and statistically significant effect on unemployment, while higher interest rates may contribute to higher unemployment. The results are expected to indicate that the inflation–unemployment relationship in Kazakhstan is weak or delayed rather than reflecting a strong short-run trade-off.

Overall, the paper argues that unemployment dynamics in Kazakhstan are influenced by a broader set of macroeconomic factors rather than inflation alone. These findings contribute to understanding labor market behavior in emerging economies and provide insights into the limitations of applying the traditional Phillips Curve framework in the context of Kazakhstan.

KEYWORDS: inflation; unemployment; Kazakhstan; Phillips Curve; OLS regression; macroeconomics

INTRODUCTION

Inflation and unemployment are two of the most important macroeconomic indicators, reflecting the overall performance and stability of an economy. Inflation influences purchasing power, consumption, and investment decisions, while unemployment reflects labor market conditions and the economy's capacity to generate employment. The relationship between these variables has long been central to macroeconomic theory, particularly through the Phillips Curve, which suggests a short-run trade-off between inflation and unemployment.

However, empirical evidence across countries shows that this relationship is not always stable. In many cases, especially in emerging economies, inflation and unemployment do not exhibit a clear inverse relationship. Kazakhstan provides an interesting case, as it has experienced periods of high inflation alongside relatively stable unemployment rates. This raises the question of whether inflation is a key determinant of unemployment in the country.

This study aims to analyze the impact of inflation on unemployment in Kazakhstan using open-source macroeconomic data. By employing an improved OLS model with lagged variables and additional controls, the paper seeks to provide a more accurate and realistic representation of the inflation–unemployment relationship.

LITERATURE REVIEW

The theoretical foundation of this study is based on the Phillips Curve, originally proposed by Phillips (1958), which suggests an inverse relationship between inflation and unemployment. This framework implies that higher inflation is associated with lower unemployment in the short run due to increased aggregate demand.

However, later contributions by Friedman (1968) and Phelps (1967) challenged this view, arguing that the trade-off between inflation and unemployment is not stable in the long run. According to their theory, expectations of inflation adjust over time, eliminating the trade-off and leading to the concept of the natural rate of unemployment.

Empirical studies in developing and transition economies provide mixed evidence. In some cases, inflation is found to reduce unemployment, while in others the relationship is weak or even positive. These inconsistencies are often explained by structural factors, external shocks, and differences in economic development.

For Kazakhstan, the relationship between inflation and unemployment may be influenced by factors such as commodity price fluctuations, exchange rate dynamics, and monetary policy adjustments. Therefore, a simple bivariate analysis may not be sufficient, and a more comprehensive empirical model is required.

METHODOLOGY

This study uses annual time-series data for Kazakhstan obtained from open sources such as the World Bank and the National Bank of Kazakhstan. The dataset includes key macroeconomic indicators necessary to analyze the inflation–unemployment relationship.

The variables used in this study are defined as follows:

Dependent Variable:
Unemployment rate (percentage of total labor force)

Independent Variables:
Inflation rate (annual consumer price index)
Lagged inflation (one-period lag)

Control Variables:
GDP growth rate
Policy interest rate (base rate)

The regression model used in this study is specified as follows:

$$Unemployment_t = \beta0 + \beta1\ Inflation_t + \beta2\ Inflation_{(t-1)} + \beta3\ GDPGrowth_t + \beta4\ InterestRate_t + \varepsilon_t$$

The inclusion of lagged inflation allows for capturing delayed effects of inflation on unemployment. GDP growth is included to control for business cycle effects, while the interest rate reflects monetary policy conditions.

The study applies an Ordinary Least Squares (OLS) estimation method. To ensure the reliability of the results, several diagnostic tests are conducted, including:

Multicollinearity test (Variance Inflation Factor)

Heteroskedasticity test (White test)

Autocorrelation test (Durbin–Watson statistic)

Normality test of residuals

These tests help validate the assumptions of the OLS model and ensure robustness of the empirical findings.

EXPECTED FINDINGS

The expected results suggest that inflation alone may not have a strong or statistically significant effect on unemployment in Kazakhstan. However, when lagged inflation and control variables are included, the model is expected to provide a more accurate representation of labor market dynamics.

GDP growth is expected to have a negative effect on unemployment, indicating that higher economic activity leads to job creation. The policy interest rate is expected to have a positive effect, reflecting the impact of tighter monetary policy on economic activity and employment.

Overall, the results are expected to indicate that the relationship between inflation and unemployment in Kazakhstan is weak or delayed rather than immediate. This suggests that the traditional Phillips Curve framework may not fully capture the dynamics of the Kazakh economy.

CONCLUSION

This paper examines the relationship between inflation and unemployment in Kazakhstan using an improved OLS model. The study contributes to the literature by focusing on an emerging economy and by incorporating lagged effects and macroeconomic controls into the analysis.

The findings are expected to show that unemployment in Kazakhstan is influenced by multiple factors rather than inflation alone. This highlights the importance of considering broader macroeconomic conditions when analyzing labor market dynamics.

Overall, the study provides insights into the limitations of the Phillips Curve in the context of Kazakhstan and contributes to a better understanding of macroeconomic relationships in emerging economies.

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STRATEGIC FLEXIBILITY AS A SOURCE OF COMPETITIVE ADVANTAGE IN MANUFACTURING FIRMS IN KAZAKHSTAN

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ABSTRACT

This study explores how strategic flexibility helps manufacturing companies in Kazakhstan achieve competitive advantage in a rapidly changing environment. Today, businesses face uncertainty, technological change, and strong competition. For manufacturing firms, this challenge is even greater because they depend on fixed assets and complex production systems. As a result, being flexible in strategy becomes very important.

The main goal of this research is to understand how strategic flexibility influences competitive advantage and to examine the role of innovation capability in this relationship. The study also looks at different types of flexibility and their importance.

A quantitative research method was used. Data were collected through an online survey with 152 respondents in Kazakhstan. The responses were analyzed using descriptive statistics, correlation, and regression analysis.

The results show that strategic flexibility has a strong positive effect on competitive advantage. Innovation capability also plays an important role, acting as a mediator. This means that flexibility improves performance both directly and through innovation. Among different types of flexibility, strategic adaptability was found to be the most important.

The study contributes to understanding how companies can stay competitive in uncertain environments. It also provides practical recommendations for managers to develop flexible strategies and strengthen innovation.

KEYWORDS

Strategic flexibility, competitive advantage, innovation capability, manufacturing firms, Kazakhstan

1. INTRODUCTION

Modern organizations operate in a fast-changing and uncertain environment. Globalization, digital technologies, and changing customer needs make it difficult for companies to rely on traditional long-term strategies. Companies need to adapt quickly to survive and grow.

This issue is especially important for manufacturing firms. Unlike service companies, manufacturing businesses depend on physical resources, production systems, and supply chains. These systems are often difficult to change quickly. However, they still need to respond to market changes, new technologies, and competition.

One way to deal with this challenge is strategic flexibility. Strategic flexibility means the ability of a company to adjust its strategies, reallocate resources, and make new decisions when conditions change. Flexible companies are not limited by fixed plans. Instead, they can adapt and respond to new opportunities and risks.

At the same time, flexibility alone is not enough. Companies must also turn flexibility into real results. This is where innovation capability becomes important. Innovation capability is the ability to create and implement new ideas, products, or processes. It helps companies use flexibility to achieve better performance and competitive advantage.

In Kazakhstan, these issues are very relevant. The country's economy is developing, and companies face uncertainty, regulatory changes, and growing competition. Therefore, understanding how strategic flexibility works in this context is important.

The main research questions of this study are:

- How does strategic flexibility affect competitive advantage?
- What role does innovation capability play?
- Do different types of flexibility have different effects?
- How do people perceive strategic flexibility in organizations?

2. METHODOLOGY

This study uses a quantitative research approach. A survey was conducted to collect data from respondents in Kazakhstan. The survey included questions about strategic flexibility, innovation capability, and competitive advantage.

A total of 152 responses were collected. Participants had different levels of experience and came from different industries. This helped to get a broad understanding of the topic.

The questionnaire was based on a Likert scale, where respondents rated their agreement with different statements. This made it possible to measure perceptions in a structured way.

The data were analyzed in several steps:

- Descriptive statistics were used to summarize the data
- Correlation analysis was used to examine relationships between variables
- Regression analysis was used to test the impact of strategic flexibility on competitive advantage
- Mediation analysis was used to examine the role of innovation capability

This approach allowed the study to test the proposed hypotheses and identify key patterns in the data.

3. RESULTS AND DISCUSSION

The results show that strategic flexibility has a strong positive effect on competitive advantage. Companies that are more flexible are better able to respond to changes, adjust their strategies, and remain competitive.

The study also found that innovation capability plays a mediating role. This means that strategic flexibility improves innovation, and innovation then improves competitive advantage. In other words, flexibility helps companies become more innovative, and this leads to better performance.

Another important finding is that different types of flexibility have different impacts. Strategic adaptability (the ability to change overall direction) was the most important factor. Resource flexibility and decision-making flexibility also had positive effects, but they were less strong.

The results also show that most respondents believe that strategic flexibility is very important, especially in uncertain and dynamic environments. This confirms that flexibility is not just a theoretical concept but a real necessity for organizations.

Overall, the findings are consistent with previous research but also provide new insights in the context of Kazakhstan, where such studies are limited.

4. CONCLUSION

This study shows that strategic flexibility is an important factor for achieving competitive advantage in manufacturing firms in Kazakhstan. Companies that can adapt their strategies, reallocate resources, and respond to changes are more likely to succeed.

Innovation capability plays a key role in this process, acting as a bridge between flexibility and performance. This means that companies should not only focus on being flexible but also on developing their ability to innovate.

From a practical perspective, managers should:

- Develop flexible and adaptive strategies
- Improve resource allocation processes
- Encourage innovation and new ideas
- Reduce rigid structures and slow decision-making

These steps can help companies remain competitive in uncertain and dynamic environments.

The study also has some limitations, such as the use of survey data and a limited sample size. Future research can explore this topic further using different methods or focusing on specific industries.

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Fundamental Equity Investing for Superior Stock Selection: Financial Statement Analysis, Intrinsic Valuation, Capital Allocation, and Behavioral Discipline

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Problem Statement and Objectives

Equity markets offer investors an opportunity to participate in corporate value creation, yet consistent stock selection remains difficult even for experienced market participants. Public companies disclose large volumes of information, market prices adjust rapidly to new announcements, and investor sentiment can move securities away from intrinsic value for meaningful periods. In this environment, many investors rely either on short-term trading signals or on isolated valuation ratios that do not capture the full quality of a business. The practical problem is that superior stock selection requires more than identifying a "cheap" stock. It requires the ability to interpret financial statements correctly, estimate intrinsic value, assess whether management allocates capital wisely, and maintain behavioral discipline when markets become volatile.

The proposed research addresses this problem by examining fundamental equity investing as an integrated decision framework rather than a single technique. The proposal argues that financial statement analysis, intrinsic valuation, capital allocation assessment, and behavioral discipline are complementary pillars of successful investing. Financial statement analysis helps investors understand profitability, liquidity, leverage, cash flow quality, and operational efficiency. Valuation analysis helps determine whether the market price differs from the company's economic worth. Capital allocation analysis evaluates whether management reinvests, acquires, repurchases shares, or distributes dividends in a way that increases long-term shareholder value. Behavioral discipline helps investors avoid overconfidence, excessive trading, confirmation bias, and short-term reactions that undermine otherwise sound analysis.

This topic is especially relevant for executive business education because managers, entrepreneurs, and investors increasingly operate at the intersection of finance, strategy, and decision-making under uncertainty. An EMBA-level thesis on fundamental equity investing can bridge these fields and produce a framework that is academically grounded while remaining directly useful for practitioners.

The central research question is: How can the integration of financial statement analysis, intrinsic valuation, capital allocation assessment, and behavioral discipline improve stock selection and long-term equity investment performance?

The study will also explore four supporting questions. First, which accounting and operating indicators are most informative for identifying financially strong firms? Second, does combining quality analysis with valuation improve the identification of undervalued stocks relative to using valuation multiples alone? Third, how do capital allocation choices influence future shareholder returns? Fourth, how can behavioral discipline reduce errors that arise even when the underlying analysis is correct?

The main objective of the thesis is to develop and test a practical framework for superior stock selection based on four dimensions: company fundamentals, intrinsic value, management capital allocation, and investor discipline. The specific objectives are to identify the financial

statement indicators most closely associated with future stock performance; evaluate the usefulness of intrinsic valuation measures in detecting mispricing; assess the role of capital allocation quality in long-term value creation; incorporate behavioral finance insights into the investment decision process; and propose an integrated stock selection model suitable for investors and executive decision makers.

Significance of the Issue

The significance of this study is both academic and practical. From an academic perspective, the proposal connects several streams of literature that are often examined separately. Accounting research focuses on the informational content of earnings, cash flow, accruals, and balance sheet strength. Valuation research focuses on intrinsic value estimation and market mispricing. Strategy and corporate finance research examine how management allocates resources and sustains competitive advantage. Behavioral finance explains why investors often deviate from rational, value-maximizing decisions. By integrating these streams, the study responds to a real gap in practice: investors do not make decisions using one lens at a time.

From a practical perspective, the issue matters because poor stock selection has direct financial consequences. Financial statement analysis is used to form expectations about a company's future performance, financial position, and risk factors for investment decisions. Valuation is central to active equity management because investors seek to compare estimated intrinsic value with market price and identify mispriced securities. These principles are widely taught, yet many investors still underperform because they rely on incomplete analysis or inconsistent execution. An integrated framework can therefore improve investment decisions by connecting what a company is worth, how it is run, and how the investor behaves.

The issue is also important because management quality is not fully captured by reported earnings alone. Dynamic capital allocation is a critical driver of long-term value creation, and firms that fail to reallocate resources toward profitable growth risk being overtaken by competitors. Durable competitive advantages, or economic moats, also help firms sustain excess returns on capital over time. For investors, this means that stock selection should include not only accounting performance and valuation but also strategic judgment regarding management decisions and competitive positioning.

Behavioral discipline adds a further layer of significance. Prior research shows that frequent trading reduces net returns and that investors often make poor decisions when facing market volatility, news shocks, or price momentum. A proposal that includes behavioral discipline recognizes that superior stock selection is not merely a matter of analytical skill; it also depends on decision quality, patience, and adherence to process.

The proposed study is therefore significant for three stakeholder groups. For investors, it offers a clearer framework for building portfolios and making buy, hold, and sell decisions. For managers, it clarifies how capital allocation and financial reporting affect market valuation. For business schools and executive programs, it contributes an interdisciplinary model that integrates finance, strategy, and behavioral decision-making.

Preliminary Literature Review and Background Information

The first pillar of the literature review is financial statement analysis. Financial analysis involves interpreting and evaluating a company's performance and position in the context of its economic environment. The role of financial statement analysis is to form expectations about future performance, financial position, and risk. This perspective is important because it frames

accounting data not as a backward-looking record but as the basis for forward-looking investment decisions. Investors use income statements, balance sheets, cash flow statements, and footnote disclosures to evaluate whether a firm earns returns on capital above its cost of capital, whether it can grow profitably, and whether it generates enough cash to finance its obligations and opportunities.

A related stream of literature in accounting and value investing argues that historical financial statement information can help investors separate strong firms from weak firms within apparently cheap stocks. Piotroski's 2000 study, "Value Investing: The Use of Historical Financial Statement Information to Separate Winners from Losers," is especially relevant because it demonstrates how accounting-based signals can improve stock selection among high book-to-market firms. The broader implication is that valuation ratios alone are insufficient. A stock may appear undervalued for good reason if its profitability is weak, its leverage is rising, or its operating efficiency is deteriorating. This logic supports the proposal's argument that financial statement quality should be assessed jointly with valuation.

The second pillar of the literature review is intrinsic valuation. Intrinsic value refers to the fundamental value of a security based on analysis of investment fundamentals and characteristics. Valuation matters because active investors seek to compare estimated value with market price, then invest when a meaningful gap exists between the two. Present value models, multiples-based valuation, and asset-based valuation remain standard tools for this purpose. In practice, discounted cash flow analysis is particularly useful when cash flow visibility and reinvestment assumptions can be justified, while relative valuation is often more practical when comparing firms within the same industry. The challenge, however, lies in using valuation models responsibly. Small changes in growth rates, margins, discount rates, or terminal assumptions can materially alter estimated value. For that reason, this proposal treats valuation not as a mechanical formula but as part of a broader framework supported by financial quality analysis and managerial assessment.

The third pillar is capital allocation and strategic quality. Long-term value creation depends on management's ability to allocate capital dynamically rather than distribute resources mechanically across existing business lines. Poor capital allocation can leave attractive growth opportunities underfunded while preserving low-return activities. From an investor's point of view, capital allocation decisions reveal how management thinks about value creation. Reinvestment in high-return projects, disciplined acquisitions, appropriately timed share repurchases, and sustainable dividend policies may all signal management quality. In contrast, value-destructive acquisitions, poorly timed buybacks, or excessive leverage can impair shareholder returns even if short-term reported earnings look strong.

Competitive advantage also matters in determining whether good returns can persist. The economic moat framework is especially useful here because it explains that companies can sustain superior returns through switching costs, network effects, intangible assets, cost advantages, and efficient scale. Firms with wide or narrow moats are better positioned to fend off competition and maintain excess returns on capital. This matters for stock selection because valuation should be linked to durability. A seemingly expensive company may be attractive if it can sustain high returns for a long time, while a statistically cheap company without a moat may remain cheap or deteriorate further.

The fourth pillar is behavioral finance. A persistent finding in the literature is that investors often behave in ways that reduce their own returns. Research on household trading behavior shows that heavily active traders earned materially lower net returns than reasonable benchmarks, which supports the argument that process discipline is central to investing success. Related overconfidence research also suggests that confidence without discipline can weaken performance.

Behavioral finance is relevant to this proposal because even a well-designed analytical framework can fail if the investor does not apply it consistently. Overconfidence can lead investors to overestimate their skill. Confirmation bias can cause them to seek evidence that supports an existing position while ignoring disconfirming information. Loss aversion can make them hold losing investments too long or avoid buying temporarily unpopular but fundamentally strong firms. Herd behavior and short-termism can push investors away from intrinsic value and toward crowded positions. By including these biases in the research design, the proposed thesis treats stock selection as both an analytical and a behavioral problem.

Taken together, the literature suggests that superior stock selection is more likely when investors combine high-quality accounting analysis, disciplined valuation, informed assessment of capital allocation, and a repeatable behavioral process. What remains less explored in practical EMBA-oriented work is how these dimensions can be combined into a single usable framework. That is the central contribution this study intends to make.

Preliminary Methodology

Theoretical Framework

The proposed theoretical framework assumes that future stock returns are influenced by four broad and interacting factors: financial quality, valuation, capital allocation quality, and behavioral discipline. Financial quality affects the sustainability of earnings and cash flows. Valuation affects the margin of safety and the probability that market price will converge toward intrinsic value. Capital allocation quality affects the long-term compounding of value within the firm. Behavioral discipline affects whether the investor can apply the framework consistently over time.

The thesis will test the proposition that firms scoring highly on the first three dimensions are more likely to outperform over a forward investment horizon, especially when the investment process imposes behavioral rules that reduce excessive trading and emotional reactions. Conceptually, the model assumes that market prices can deviate from intrinsic value in the short run, but that financially strong firms with capable management and durable competitive advantages are more likely to generate attractive long-term returns. The framework therefore links company-level fundamentals to investor-level decision quality.

The study will explore the following preliminary hypotheses. First, firms with stronger financial statement quality generate higher forward risk-adjusted returns than financially weak firms. Second, stocks that combine strong financial quality with attractive intrinsic valuation outperform stocks selected on valuation multiples alone. Third, firms with more disciplined capital allocation practices generate superior long-term shareholder returns. Fourth, a rule-based investment process designed to reduce overconfidence and excessive trading improves realized portfolio outcomes relative to a less disciplined process.

Data Description

The empirical component of the thesis will use secondary data from publicly listed non-financial firms, with an initial focus on U.S. equities because of data availability, disclosure quality, and comparability across firms. The proposed sample period is 2015–2025, which is long enough to include different market conditions, including expansion, crisis, recovery, and higher interest rate periods. The sample may be drawn from the S&P 1500 universe or, if data access is limited, from the S&P 500 as a more feasible but still representative sample.

Financial statement data will be obtained from annual reports, audited financial statements, SEC filings, and, where available, financial databases such as Refinitiv, Bloomberg, Capital IQ, or publicly accessible alternatives. Market data, including prices, returns, market capitalization, and trading turnover, may be collected from exchange data, Yahoo Finance, or institutional databases available through the university. Where possible, earnings call transcripts and management commentary will be used qualitatively to interpret capital allocation decisions.

The sample will exclude financial institutions and utilities in the baseline analysis because their balance sheet structures, regulatory environments, and valuation conventions differ materially from those of industrial and service firms. The study may also winsorize extreme observations to reduce the influence of outliers and ensure more reliable estimations.

Variables Description

The dependent variable will be forward stock performance measured primarily as 12-month buy-and-hold return and, where appropriate, excess return relative to a market benchmark. A secondary dependent measure may be risk-adjusted return, using either Sharpe-style measures or factor-adjusted abnormal returns.

Independent variables will be organized into four groups. First, financial statement quality variables will include return on assets, return on invested capital, operating cash flow to total assets, accrual measures, gross margin trend, asset turnover trend, leverage change, liquidity ratios, and earnings stability. These indicators capture profitability, cash flow quality, balance sheet strength, and operating efficiency.

Second, valuation variables will include price-to-book ratio, price-to-earnings ratio, enterprise value to EBITDA, free cash flow yield, and, where feasible, a discounted cash flow–implied valuation gap. The aim is to distinguish between apparently cheap stocks and genuinely undervalued stocks.

Third, capital allocation variables will include dividend payout ratio, share repurchase intensity, acquisition expenditure relative to assets, reinvestment rate, capital expenditure efficiency, and a proxy for value creation such as return on invested capital relative to the cost of capital. These measures are intended to capture whether management uses capital in a way that supports compounding.

Fourth, behavioral and process-related variables will include turnover, recent volatility, momentum reversal indicators, and valuation dispersion as indirect proxies for environments where behavioral errors may be more likely. In addition, the back-testing component of the study will apply explicit process rules such as minimum holding periods, valuation thresholds, and sell-discipline criteria to evaluate whether structured decision rules improve outcomes.

Control variables will include firm size, sector, beta, prior momentum, and possibly macroeconomic controls such as inflation or interest-rate regime. These controls will help isolate the association between the core explanatory variables and future returns.

Estimation Method

The analysis will begin with descriptive statistics and correlation analysis to understand the distribution and relationships of the variables. The next step will be to construct composite scores for financial quality, valuation attractiveness, and capital allocation quality. Firms may then be sorted into quintiles or deciles to compare subsequent returns across groups.

Panel regression analysis will be used to test the relationship between the explanatory variables and forward stock returns while controlling for firm-specific and market factors. Depending on data structure and availability, fixed-effects or random-effects models may be

considered. To strengthen robustness, the study may also use Fama–MacBeth cross-sectional regressions or portfolio-sorting methods commonly employed in asset pricing research.

A comparative strategy analysis will also be conducted. One portfolio will be constructed using valuation signals alone. A second portfolio will combine valuation and financial quality filters. A third portfolio will add capital allocation quality. A fourth, rules-based portfolio will incorporate behavioral discipline through lower turnover and predefined buy/sell rules. Comparing these portfolios across return, volatility, drawdown, and turnover measures will help determine whether the integrated framework improves stock selection outcomes.

Robustness checks may include excluding crisis years, testing alternative holding periods, using sector-neutral rankings, and substituting different valuation measures. The methodological goal is not merely to identify statistically significant variables but to propose an investment process that is both empirically informed and practically usable.

Timeline of the Thesis Work

Period	Planned Work
Month 1	Finalize the proposal after supervisor feedback and confirm the detailed research design.
Months 2–3	Expand the literature review and finalize the theoretical framework, hypotheses, and sample definition.
Months 3–4	Collect, clean, and organize financial statement data, market data, and supporting information.
Month 5	Construct variables, valuation measures, and composite quality and capital allocation scores.
Months 6–7	Conduct descriptive analysis, regression tests, portfolio tests, and robustness checks.
Month 8	Draft the findings, discussion, implications, and conclusion chapters.

Month 9	Revise the full thesis, finalize references and formatting, and prepare for submission and defense.

This timeline is preliminary and may be adjusted in consultation with the supervisor depending on data access, analysis complexity, and program deadlines.

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Logistics Aspects of Digitalization of Circularity in Industrial Parks

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ABSTRACT

1 INTRODUCTION

Support for innovative promotion is realised through industrial parks (IP).

The IPs for digitalization implement ICT with priority on data analysis in the direction of intellectualization of industrial actions (Zong et al., 2018).

By 2026 10 state IPs have been created in the Republic of Azerbaijan, eight of which are at the operational stage. The current period is characterized by the presence of a specific government directive regarding the digitalization of the IPs.

This refers to the AI Strategy regarding 2025-28, particularly its direction, which provides the functioning the residents producing AI (Decree, 2025).

Objective: to develop a digital logistics sharing option in the role of a mechanism of implementing the fundamentals of a circular economy in the IPs.

Subject: the impact of digitalization of collective car use on the work of the IPs.

Scientific novelty: a digital dispatcher procedure (logistics sharing) is proposed with the aim of providing economic productivity of symbiosis with the IPs of the Republic of Azerbaijan through digitalization mechanisms.

2 LITERATURE

The improvement of traditional IP depends on the change of functions and types of industrial structure. In this regard, with the priority of realising true digitalization of the IP infotechnology is required in the direction of such tools as mobile networks, cloud applications, the Internet of Things. This will lead to the resolution of security difficulties (Rodríguez and Bañuls, 2022).

The main drawback of the digitalization of the IP is the lack of adaptive, comparable solutions in the direction of integration services and equipments. This limits the formation of an industrial environment with using AI. Therefore, with priority on achieving this effect the use of IT, digital platforms and interorganizational infosystems would lead to resource optimization, scenario generation. Moreover, promotion is needed here thanks to a collective process (Rodríguez and Bañuls, 2022).

The economic benefit from the work of the IP can be summarized by a qualitative reduction of the internal and surrounding environment. This may lead to a decrease of the competitive advantage and image of the IP with its residents (IBRD/WB, 2021).

An updated parameter of areals implementing actions in the direction of improving economic-environmental and social-management indicators is the ecoIPs (IBRD/WB, 2021).

Thus, the application of circular economy aspects in the IP is accompanied by the use of innovative approaches.

After the installation of the technologies concerning industrial symbiosis and control of eco-indicators by the management company, in order to determine the potential of implementation a

data series collection and monitoring are required, including at the business level. These may include, for example, the number of participating residents of industrial symbiosis (IBRD/WB, 2021).

Productive eco-monitoring and database complexes are able in perspective to identify potential by new complexes (IBRD/WB, 2021).

3 METHOD

When conducting the research, we turned to the method of qualitative study of thematic literature. Among these, an analysis of the IBRD and World Bank report (2021) regarding the circular economy in the IP can be noted. In addition, the article by Zong et al. (2018) regarding the regulation and design of the IP`s digitalization. The article by Rodríguez and Bañuls (2022) regarding the difficulties of digitalization of the IP was analyzed. The current situation of regulatory support of the digitalization of the IP of the Republic of Azerbaijan in accordance with the AI Strategy regarding 2025-28 was presented. The material of Dirko (2022) regarding circular logistic models was used.

4 DISCUSSION

The goal of logistics in a circular economy is the reduction of the carbon footprint through the principle of collective use, which assumes the implementation of IT-tools.

Significance of the work: - the proposed digital platform represents a transitional stage to Industry 4.0. This variation can be implemented for regions as well (scale); - the variation reduces the environmental burden and business costs (synergy); - it forms resident trust due to the automation and transparency of resource barter (removal of barriers) (Dirko, 2022).

5 CONCLUSION

So:

- the circular economy forms the foundation of freight consolidation in the role of reverse waste logistics;
- the digital platform in the IP promotes low transaction costs, the unification of residents;
- the collective use of assets leads to a reduction of empty transport routes.

In this context, we propose to adapt a variation of the general digital dispatcher for Azerbaijani IPs. This dispatcher reduces its carbon footprint thanks to the exclusion of a non-cargo flight. The process is as follows: since there is a semi-empty shipment of vehicles by residents, the proposed digital platform will implement a single route based on the connection of various production orders.

The process is known as circular logistics (logistics sharing).

In other words, we propose the use of a cloud platform of regulating internal transport movements in the IP. The functional component assumes online collection of information regarding the delivery schedule of all residents. As a result, a vehicle that brought raw materials to one resident, upon returning, picks up waste from the rest. In this dispatch center transportation requests are being generated and available vehicle spaces are being determined online.

An important trend in socio-economic promotion and a demand of the promotion of the IP is the application of standards. The use of the standard on digitalization of the IPs will lead to an increase of their competitive advantage, support the accelerated promotion of the IP`s economy (Zong et al., 2018). And the use of partner digital platforms will lead to the formation of logistics standards (Dirko, 2022).

Practical significance: the presented applied digital mechanism facilitates the transition of the IP`s logistics processes into a closed loop. The mechanism is significant for the IPs, residents and the state.

KEYWORDS: industrial park, industrial symbiosis, digitalization, circular economy, logistics sharing

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Execution: The Role of Digital Transformation in Enhancing Project Efficiency in Emerging Markets – The Case of Kazakhstan

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ABSTRACT

The growing importance of Environmental, Social, and Governance (ESG) standards, combined with rapid digital transformation, is reshaping project management practices globally. While developed economies demonstrate effective integration of ESG principles through digital tools, emerging markets face significant challenges in localizing these standards and translating them into measurable project outcomes. This study investigates the role of digital transformation in facilitating ESG integration and enhancing project efficiency in Kazakhstan.

The research aims to examine how digital tools enable the operationalization of global ESG standards at the project level and improve efficiency in terms of cost, time, and quality. A mixed-method approach is employed, combining quantitative survey data from approximately 130 project professionals with qualitative insights from semi-structured interviews. The study focuses on project-based organizations in key sectors, including energy, infrastructure, construction, and telecommunications.

The conceptual framework proposes that digital transformation acts as a mediating factor between ESG standards and project efficiency. Digital technologies such as project management systems, data analytics, and ESG reporting platforms enhance transparency, real-time monitoring, and decision-making processes. This, in turn, improves governance and reduces project risks.

Preliminary expectations suggest that higher levels of digital maturity significantly strengthen ESG integration and positively impact project efficiency. However, institutional constraints, regulatory inconsistencies, and limited expertise in emerging markets may hinder this process.

The study contributes to the literature by providing project-level empirical evidence from an emerging market context, addressing a gap in ESG and digital transformation research. Practically, it offers actionable insights for project managers and policymakers on leveraging digital tools to improve ESG implementation and project performance.

Keywords: ESG, digital transformation, project efficiency, emerging markets, Kazakhstan, project management, sustainability.

INTRODUCTION

1.1 Research Background and Motivation

In recent years, Environmental, Social, and Governance (ESG) considerations have moved from peripheral concerns to central elements of corporate strategy and project management practices. Organizations are increasingly expected to demonstrate not only financial performance but also accountability in sustainability, social responsibility, and governance transparency. This shift is driven by growing pressure from investors, regulators, and stakeholders, positioning ESG as a critical determinant of long-term competitiveness and access to capital.

At the same time, digital transformation has emerged as a key enabler of organizational efficiency and innovation. The integration of digital technologies—such as enterprise resource planning (ERP) systems, cloud computing, and data analytics—has fundamentally reshaped how projects are planned, monitored, and executed. These technologies enable real-time data processing, improve coordination among stakeholders, and support evidence-based decision-making, all of which are essential for enhancing project performance.

The convergence of ESG and digital transformation represents a significant development in contemporary management. Digital technologies are widely viewed as mechanisms that can operationalize ESG principles by enabling accurate data collection, automated reporting, and continuous monitoring of sustainability indicators. Prior research generally assumes a positive relationship, suggesting that digital transformation enhances ESG performance and, in turn, improves organizational and project outcomes.

However, this assumption may not hold in emerging market contexts. Despite increasing adoption of ESG frameworks and digital tools, their effective implementation often remains limited. Institutional constraints, regulatory fragmentation, and uneven digital maturity may hinder the integration of ESG practices into operational processes. As a result, ESG and digital transformation initiatives may coexist within organizations without being strategically aligned.

Kazakhstan provides a relevant and underexplored setting to examine this issue. As an emerging economy with substantial investment in infrastructure, energy, and telecommunications, the country faces growing pressure to align with global ESG standards while simultaneously advancing digitalization initiatives. Despite these developments, project inefficiencies—such as delays, cost overruns, and coordination challenges—remain persistent. This raises an important question: whether the adoption of ESG and digital transformation actually translates into improved project performance in practice.

This study is motivated by the need to move beyond the assumption of positive relationships and to empirically test whether digital transformation facilitates ESG integration and whether these factors contribute to project efficiency in an emerging market context.

1.2 Research Objectives

The main objective of this study is to examine the relationships between digital transformation, ESG integration, and project efficiency at the project level in Kazakhstan.

Specifically, the study aims to:

- Analyze the impact of digital transformation on ESG integration
- Evaluate the effect of ESG integration on project efficiency
- Examine the mediating role of digital transformation in the relationship

between ESG integration and project efficiency

1.3 Research Questions

To achieve these objectives, the study addresses the following research questions:

1. How does digital transformation influence ESG integration at the project level?
2. To what extent does ESG integration affect project efficiency?
3. Does digital transformation mediate the relationship between ESG integration and project efficiency?

1.4 Significance of the Study

This study contributes to both theory and practice by challenging the commonly assumed positive relationship between ESG integration, digital transformation, and performance outcomes.

From a theoretical perspective, the research extends existing literature by providing empirical evidence from an emerging market context, where institutional and organizational conditions differ significantly from those in developed economies. The findings highlight the importance of distinguishing between the adoption of ESG and digital technologies and their effective integration into operational processes.

From a practical perspective, the study provides insights for project managers, organizations, and policymakers in Kazakhstan. It emphasizes that the mere presence of digital tools and ESG practices is insufficient to improve project efficiency. Instead, performance gains depend on the extent to which these elements are strategically aligned and embedded within project management processes.

LITERATURE REVIEW

This chapter reviews the literature on digital transformation, ESG (Environmental, Social, and Governance) integration, and project efficiency, and develops the theoretical foundation of the study. It synthesizes insights from strategic management, sustainability, and project management literature to establish the relationships between key variables. Particular attention is given to the limitations of existing research in emerging market contexts, which form the basis for the study's hypotheses.

2.1 Digital Transformation

2.1.1 Definition and Concept

Digital transformation refers to the integration of digital technologies into organizational processes to enhance performance, enable innovation, and create value (Vial, 2019). Unlike simple digitalization, which focuses on converting analog processes into digital form, digital transformation involves a fundamental reconfiguration of business models, workflows, and decision-making structures (Bharadwaj et al., 2013).

Technologies such as cloud computing, enterprise resource planning (ERP) systems, and data

analytics enable organizations to process large volumes of information in real time, improving transparency and responsiveness. However, the effectiveness of digital transformation depends not only on technology adoption but also on the extent to which these technologies are embedded within organizational processes.

2.1.2 Digital Transformation in Project Management

In project-based environments, digital transformation enhances coordination, monitoring, and control. Digital tools such as Building Information Modeling (BIM), project management platforms, and integrated information systems enable real-time tracking of project progress, cost performance, and risk indicators. These capabilities reduce information asymmetry and improve communication among stakeholders, which are critical factors in complex projects (Vial, 2019).

Despite these advantages, the benefits of digital transformation in project management are contingent upon effective implementation. Partial or fragmented adoption may limit its impact, particularly in environments where organizational processes remain unchanged.

2.1.3 Digital Transformation as a Strategic Capability

From the perspective of the Resource-Based View (RBV), digital transformation represents a strategic capability that can generate competitive advantage when effectively integrated into organizational routines (Bharadwaj et al., 2013). However, this capability is not inherent in technology itself; rather, it emerges from the alignment between digital tools and organizational objectives.

In emerging markets, digital transformation is often constrained by limited infrastructure, skills gaps, and organizational resistance (Kshetri, 2021). As a result, digital technologies may be adopted without being fully integrated into decision-making processes, reducing their potential to improve performance outcomes.

2.2 ESG Integration

2.2.1 Definition of ESG

ESG refers to a set of environmental, social, and governance criteria used to evaluate the sustainability and ethical impact of organizational activities. ESG has become a central component of corporate strategy due to its influence on investor decisions, regulatory compliance, and long-term value creation (Bansal et al., 2021; Friede et al., 2015).

2.2.2 ESG in Project Management

In project management, ESG integration involves embedding sustainability considerations into project planning, execution, and evaluation. This includes minimizing environmental impact, ensuring social responsibility, and maintaining governance practices such as transparency and accountability.

Previous studies suggest that ESG integration improves project outcomes by enhancing risk management, reducing inefficiencies, and strengthening stakeholder relationships (Silvius & Schipper, 2014). However, these benefits depend on the extent to which ESG principles are incorporated into operational processes rather than treated as external requirements.

2.2.3 ESG in Emerging Markets

The implementation of ESG in emerging markets differs significantly from that in developed economies. In many cases, ESG adoption is driven by external pressures—such as regulatory requirements, investor expectations, and international standards—rather than internal strategic priorities (Kshetri, 2021).

Consequently, ESG practices may remain symbolic or compliance-oriented, focusing on reporting rather than operational integration. This phenomenon limits the ability of ESG initiatives to generate tangible performance improvements, particularly at the project level.

2.3 Project Efficiency

2.3.1 Definition

Project efficiency refers to the ability to deliver projects within predefined constraints of time, cost, and quality. It is a key indicator of project performance and organizational effectiveness.

2.3.2 Determinants of Project Efficiency

Project efficiency is influenced by several factors, including planning accuracy, resource allocation, risk management, and stakeholder coordination. Effective information flow and transparency are particularly important in ensuring timely and cost-effective project execution.

Both digital transformation and ESG integration are expected to enhance these determinants by improving data availability, governance structures, and decision-making processes. However, the realization of these benefits depends on the degree of integration within project management systems.

2.4 Digital Transformation and ESG Integration

Digital transformation is widely considered an enabler of ESG integration. Digital technologies facilitate the collection, analysis, and reporting of sustainability data, improving transparency and accountability (Del Giudice et al., 2022; George et al., 2021). For example, digital dashboards and analytics platforms allow organizations to monitor ESG indicators in real time, embedding sustainability into operational workflows.

Prior studies generally report a positive relationship between digital transformation and ESG performance. However, this relationship assumes that digital tools are effectively aligned with sustainability objectives. In contexts where digital technologies are used primarily for operational efficiency rather than ESG-related purposes, their impact on ESG integration may be limited.

This limitation is particularly relevant in emerging markets, where digital transformation

H1: Digital transformation positively influences ESG integration.

2.5 ESG Integration and Project Efficiency

ESG integration is expected to improve project efficiency by enhancing governance, reducing risks, and strengthening stakeholder engagement. Sustainable project management practices contribute to better planning, improved compliance, and more efficient resource utilization (Friede et al., 2015; Silvius & Schipper, 2014).

However, the effectiveness of ESG integration depends on its depth of implementation. When ESG practices are limited to compliance and reporting, their impact on project efficiency may be negligible. In such cases, ESG does not influence core project processes and therefore fails to improve performance outcomes.

This distinction is particularly important in emerging markets, where ESG adoption may not be fully embedded in operational activities.

H2: ESG integration positively affects project efficiency.

2.6 Mediating Role of Digital Transformation

Digital transformation is expected to strengthen the relationship between ESG integration and project efficiency by enabling the practical implementation of sustainability practices. Digital tools support real-time monitoring, data-driven decision-making, and continuous performance improvement, which are essential for translating ESG principles into operational outcomes.

However, the mediating effect of digital transformation depends on the degree of alignment between digital systems and ESG objectives. If digital technologies and ESG practices are implemented independently, without integration, the expected mediation effect may not materialize.

This suggests that digital transformation alone is insufficient; its effectiveness depends on how it is utilized to support ESG integration within project workflows.

H3: Digital transformation mediates the relationship between ESG integration and project efficiency.

2.7 Theoretical Framework

This study is grounded in two complementary theoretical perspectives: Institutional Theory and the Resource-Based View (RBV).

Institutional Theory explains the adoption of ESG practices as a response to external pressures, such as regulatory requirements, investor expectations, and societal norms. This perspective suggests that organizations may adopt ESG practices to gain legitimacy rather than to improve performance.

In contrast, the Resource-Based View emphasizes the role of internal capabilities in generating competitive advantage. From this perspective, digital transformation represents a strategic capability that can enhance organizational performance when effectively integrated into processes.

Together, these theories provide a comprehensive framework for understanding the gap

between adoption and implementation. While Institutional Theory explains why organizations adopt ESG practices, RBV explains why such adoption does not necessarily lead to improved outcomes without effective integration with organizational capabilities.

RESEARCH METHODOLOGY

3.1 Research Design

This study adopts a quantitative research design to empirically test the hypothesized relationships between variables. A survey-based approach is employed to collect primary data from project professionals, allowing for systematic analysis using statistical techniques.

The quantitative method is appropriate as it enables objective measurement of constructs and facilitates generalizable insights into the relationships between digital transformation, ESG integration, and project efficiency (Hair et al., 2019).

3.2 Data Collection

3.2.1 Sampling

The target population consists of professionals involved in project-based industries in Kazakhstan, including construction, energy, telecommunications, and infrastructure.

A purposive sampling technique is applied to ensure that respondents possess relevant experience in project management and familiarity with ESG and digital practices. The final sample includes 127 respondents, which satisfies minimum requirements for regression-based analysis and provides sufficient statistical power (Hair et al., 2019).

3.3.2 Survey Instrument

Data were collected using a structured questionnaire based on a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree).

The questionnaire is divided into three constructs:

- Digital Transformation (5 items)
- ESG Integration (5 items)
- Project Efficiency (5 items)

Each construct is operationalized using multiple indicators to enhance measurement accuracy and internal consistency.

3.3 Variables and Measurement

The study includes three key variables:

- **Digital Transformation (Independent Variable)**

Reflects the extent to which digital tools are adopted in project management processes.

- **ESG Integration (Mediating Variable)**

Captures the degree to which sustainability practices are embedded within project activities.

- **Project Efficiency (Dependent Variable)**

Measures project performance in terms of time, cost, and risk management.

Table 1. Variables and Their Measurement

Variable	Type	Description	Measurement
Digital Transformation	Independent (IV)	Adoption of digital tools in project management	Average of B1–B5
ESG Integration	Mediator (MV)	Integration of ESG practices into projects	Average of C1–C5
Project Efficiency	Dependent (DV)	Performance in time, cost, and risk	Average of D1–D5

All variables are measured as composite indices calculated from the mean values of their respective items.

3.4 Model Specification

To test the hypotheses, the study employs multiple regression analysis.

Model 1:

Examines the effect of digital transformation on ESG integration

→ $ESG = \beta_0 + \beta_1(Digital) + \varepsilon$

Model 2:

Evaluates the impact of ESG integration and digital transformation on project efficiency

→ $Efficiency = \beta_0 + \beta_1(ESG) + \beta_2(Digital) + \varepsilon$

The mediation effect is assessed by examining:

- Digital → ESG
- ESG → Efficiency
- Digital → Efficiency

A mediation effect is supported only if all relationships are statistically significant.

3.5 Data Analysis Methods

The analysis is conducted in several stages:

Descriptive Statistics

Used to summarize the central tendencies and variability of the data.

Table 2. Descriptive Statistics

Variable	**Mean**	**Standard Deviation**	**Minimum**	**Maximum**
Digital Transformation	3.58	0.58	2.00	4.80
ESG Integration	3.40	0.51	2.20	4.80
Project Efficiency	3.45	0.52	2.20	4.80

Reliability Analysis

Measured using Cronbach's Alpha, with values above 0.70 indicating acceptable internal consistency.

Table 3. Reliability Analysis

Variable	Number of Items	Cronbach's Alpha
Digital Transformation	5	0.82
ESG Integration	5	0.79
Project Efficiency	5	0.81

Regression Analysis

Used to test hypotheses and assess relationships between variables, based on:

- Coefficients (β)
- p-values (statistical significance)
- R-squared (model explanatory power)

Table 4. Regression Results: Digital Transformation and ESG Integration

Variable	Coefficient (β)	Std. Error	t-value	p-value
Constant	3.372	0.286	11.77	0.000
Digital Transformation	0.009	0.079	0.111	0.912

3.6 Validity and Reliability

The study ensures methodological rigor through:

- Content Validity: Survey items are derived from established literature
- Construct Validity: Multiple indicators are used for each variable
- Reliability: Confirmed through Cronbach's Alpha values exceeding acceptable thresholds

3.7 Ethical Considerations

The study adheres to ethical research standards:

- Participation is voluntary
- Responses are anonymous
- Data is used exclusively for academic purposes

Respondents were informed about the purpose of the study prior to participation.

DISCUSSION OF FINDINGS

The findings of this study do not support the proposed hypotheses, as no statistically significant relationships were identified between digital transformation, ESG integration, and project efficiency. While these results may initially appear inconsistent with prior research, they provide important insights into the dynamics of ESG and digital transformation in emerging market contexts.

Table 5. Summary of Hypothesis Testing

Hypothesis	Statement	Result
H1	Digital transformation positively influences ESG integration	Not Supported
H2	ESG integration positively affects project efficiency	Not Supported
H3	Digital transformation mediates the relationship	Not Supported

First, the absence of a significant relationship between digital transformation and ESG integration suggests that digital technologies are not effectively utilized to support sustainability practices. Although organizations demonstrate moderate levels of digital adoption, these tools appear to be applied primarily for operational efficiency rather than for ESG-related objectives. This indicates a lack of strategic alignment between digital transformation initiatives and sustainability goals.

Second, the results show that ESG integration does not have a statistically significant effect on project efficiency. While ESG is theoretically associated with improved governance, risk management, and stakeholder engagement, these benefits depend on the depth of implementation. The findings suggest that ESG practices in the studied context are not sufficiently embedded within project management processes to influence performance outcomes.

Third, the absence of a mediation effect indicates that digital transformation does not strengthen the relationship between ESG integration and project efficiency. This further reinforces the argument that digital tools and ESG practices operate independently rather than as complementary elements of a unified strategy.

These findings can be interpreted through the lens of decoupling, where organizations adopt formal structures—such as ESG frameworks and digital systems—without integrating them into core operational activities. In this context, ESG and digital transformation coexist at a superficial level, limiting their combined impact on project performance.

The results are also consistent with Institutional Theory, which suggests that organizations in emerging markets may adopt ESG practices in response to external pressures rather than internal strategic priorities. At the same time, the findings align with the Resource-Based View, which emphasizes that capabilities such as digital transformation generate value only when effectively integrated into organizational processes.

Importantly, the findings do not imply that ESG or digital transformation lack value. Rather, they highlight a critical implementation gap between adoption and effective utilization. This distinction is particularly relevant in emerging markets, where institutional constraints, limited digital maturity, and organizational barriers may hinder integration.

Overall, the study challenges the commonly assumed positive relationship between ESG, digital transformation, and performance outcomes. It suggests that the effectiveness of these factors depends not on their presence, but on the extent to which they are strategically aligned and embedded within project management practices.

CONCLUSION AND IMPLICATIONS

5.1 Summary of the Study

This study examined the relationships between digital transformation, ESG (Environmental, Social, and Governance) integration, and project efficiency in the context of Kazakhstan as an emerging market.

A quantitative research approach was employed, using survey data collected from 127 project professionals across industries such as construction, energy, and telecommunications. Regression analysis was applied to test the proposed relationships and assess the mediating role of digital transformation.

The descriptive results indicated moderate levels of digital transformation, ESG integration, and project efficiency. However, the regression analysis revealed that none of the hypothesized relationships were statistically significant. Specifically, digital transformation did not significantly influence ESG integration, ESG integration did not significantly affect project efficiency, and no mediation effect was observed.

These findings suggest that the expected performance benefits associated with ESG and digital transformation are not realized in the studied context.

5.2 Conclusion

This study provides important insights into the interaction between digital transformation and ESG integration in an emerging market context. Contrary to the dominant assumption in the literature, the results demonstrate that the presence of digital technologies and ESG practices does not automatically lead to improved project efficiency.

The findings highlight a critical distinction between adoption and integration. While organizations in Kazakhstan have adopted digital tools and ESG frameworks, these elements are not effectively embedded within project management processes. As a result, their potential to enhance performance remains largely unrealized.

Furthermore, the study reveals a lack of strategic alignment between digital transformation initiatives and ESG objectives. Digital technologies are primarily utilized for operational purposes, whereas ESG practices are often treated as compliance requirements. This separation prevents organizations from leveraging the complementary benefits of these two domains.

From a broader perspective, the results suggest that in emerging markets, the key challenge

is not the availability of digital technologies or ESG frameworks, but their effective integration into organizational routines. Without such integration, these initiatives remain fragmented and fail to generate measurable outcomes.

5.3 Practical Implications

The findings of this study offer several important implications for organizations and policymakers.

For Organizations

Organizations should shift their focus from the mere adoption of digital tools and ESG practices toward their integration within project management processes. Digital technologies should be leveraged not only for operational efficiency but also for tracking, monitoring, and managing ESG-related indicators in real time.

In addition, companies should invest in organizational capabilities, including employee training and process redesign, to ensure that digital systems and ESG objectives are aligned. Embedding ESG metrics into digital platforms can enhance transparency, improve decision-making, and support more efficient project execution.

For Policymakers

Policymakers should move beyond promoting ESG adoption through reporting requirements and instead focus on encouraging substantive implementation. This may include developing clearer guidelines, enforcement mechanisms, and incentives that support the integration of ESG practices into operational processes.

Furthermore, policies aimed at supporting digital transformation should emphasize not only technological adoption but also capability development, ensuring that organizations can effectively utilize digital tools in alignment with sustainability objectives.

5.4 Theoretical Implications

This study contributes to the literature by challenging the widely accepted assumption of a positive relationship between digital transformation, ESG integration, and performance outcomes.

First, it provides empirical evidence that such relationships may not hold in emerging market contexts, where institutional and organizational conditions differ significantly from those in developed economies.

Second, the study reinforces the importance of distinguishing between adoption and effective implementation, highlighting that the presence of ESG practices and digital technologies does not guarantee performance improvements.

Finally, by integrating Institutional Theory and the Resource-Based View, the study offers a more nuanced explanation of organizational behavior. While Institutional Theory explains the external pressures driving ESG adoption, the Resource-Based View emphasizes the role of internal capabilities in translating these practices into tangible outcomes.

5.5 Limitations of the Study

Despite its contributions, this study has several limitations.

First, the sample size is limited to 127 respondents, which may affect the generalizability of the findings. Second, the use of self-reported survey data may introduce response bias. Third, the study focuses exclusively on Kazakhstan, limiting the applicability of the results to other emerging markets.

Additionally, the use of regression analysis may not fully capture complex relationships between variables, particularly in the presence of indirect or latent effects.

5.6 Recommendations for Future Research

Future research should expand the scope of analysis by including larger and more diverse samples across multiple countries to enhance generalizability.

Further studies may also employ advanced analytical techniques, such as Structural Equation Modeling (SEM), to better capture complex and multidimensional relationships between digital transformation, ESG integration, and performance outcomes.

In addition, future research could explore the role of contextual factors such as organizational culture, leadership, and institutional support, which may influence the effectiveness of ESG and digital transformation initiatives.

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Economic Impact of International Sanctions on Neighboring and Comparable Economies (2011–2024)

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The study examined the economic impact of sanctions on a country as an effect of international sanctions on neighboring and structurally similar economies from 2011 to 2024. Although there is a lot of work to date on studying the economies of countries under sanctions, although much work has been done to date on the economies of sanctioned countries, how could this affect neighboring countries that were not under sanctions. The study shows how CIS countries have direct links with each other as trade, investment and financial systems. Analysis conducted in 9 CIS countries using annual macroeconomic data from the World Bank.

Chose a dependent variable such as FDI for the study. Independent variables included trade openness, gross capital formation, inflation, GDP growth, and the logarithm of the official exchange rate. The additional variables that will show key changes in the economy are 2020 and 2022. It was during this period that critical changes occurred due to the Covid-19 pandemic and military conflict in the eastern Europe.

Empirical analysis using a panel regression with random effects and clustered standard errors. The method of Feasible Generalized Least Squares (FGLS), adjusted for heteroscedasticity and auto-correlation, is used as a verification of robustness. The choice between fixed and random effects is based on the Hausman test, multicollinearity is tested via VIF.

As a result, it was shown that gross fixed capital formation is the only robust and statistically significant determinant of FDI inflows. The remaining variables are not significant in the regression model.

Keywords: International sanctions, foreign direct investment, panel data, CIS economies, external shocks, neighboring economies, transition economies, FGLS

Introduction

When 2 parties fail to reach an agreement, the interests of one side may be rejected. If the other side then begins to violate legal agreements, restrictive measures are often introduced. In geopolitics, states tend to limit the economic opportunities of unfriendly countries by using international economic sanctions as a policy instrument. Such actions may have a partial indirect impact through trade, investment, financial, and exchange-rate channels. However, there is also a hidden effect that is rarely discussed: due to sanctions, neighboring countries may also face uncertainty and indirect consequences. Although this effect may not be as strong as expected, it is still present. This is particularly relevant for developing and transition economies, where external events affect capital growth, the attractiveness of investment assets, and the macroeconomic stability of a country. Therefore, it is important to study not only the direct but also the indirect impact of sanctions on neighboring economies.

Research Problem

How do international sanctions affect neighboring and comparable economies through indirect economic channels during the period 2011–2024?

Based on this framework, the study focuses on how external restrictions, including international sanctions, as well as other macroeconomic shocks such as pandemics or military escalation, applied to one country may generate indirect effects on neighboring economies or countries with similar export structures. This approach allows for the analysis of the relationship between trade restrictions and domestic economic crises in selected countries and provides an approximate assessment of changes in the allocation of economic activity, budget priorities, and foreign direct investment flows.

This study addresses the gap in the existing literature by focusing on the indirect economic impact of international sanctions on selected neighboring and comparable economies over the period 2011–2024.

With the formation of such a term as statehood and the definition of a neighboring state , began to be born trade by negotiation , but in certain confrontation , there is a denial of trade ,which leads to military conflicts, and when war will take more resources. You have to completely limit your opponent to reduce the economic potential of your neighbor. So recently, large economies of countries are forming alliances not only to protect , but also to control the economy , which serves as a key tool for influencing the global arena. Although, the consequences of regulating the economy under sanctions are well understood , attention is drawn to the indirect impact on neighboring countries which have a certain economic dependence and countries with similar economies.

Countries subject to sanctions often have strong trade, investment and financial links with neighboring countries or structurally similar economies. As a result, economic pressures affecting countries under sanctions may also affect states without these restrictions on the reciprocal lines of trade, including changes in the intensity of foreign direct investment, reorientation of trade, This allows for regional economic integration.

Research Objectives

- to analyze the economic impact of international sanctions on selected sanctioned economies
- to examine indirect effects on neighboring and comparable non-sanctioned economies
- to assess changes in foreign direct investment flows associated with sanctions
- to compare macroeconomic outcomes between sanctioned and non-sanctioned countries

Significance of the Issue

The significance of this study is that it focuses on regional and indirect economic impacts of economic sanctions. This will help to identify trends in how sanctions affect not only the target countries, but also neighboring and similar economies. This will allow to highlight certain risks in economic importance for politicians, investors and international organizations.

The conclusion of the study will indicate that the study will address certain factors to help realize economic potential in case of both negative and positive nature, for changes in the domestic economy and set priorities in foreign trade, also in current resource management. The study also contributes to a limited empirical literature on sanctions and regional economic dynamics in developing countries and economies in transition.

Literature Review

Article	Author	Country/firms	Period	Variables	Methodology	Theory	Results
The Investment Development Path theory: Evidence from developing countries' agricultural sector (2023)	Justice Gameli Djokoto	55 countries	1991 to 2021	NOFDIPC (net outward minus inward FDI per capita)	Panel FE/RE	Theory: Investment Development Path	Agriculture in developing countries is mostly at stages I–II of the Investment Development Path (IDP). To progress, these countries need policies that boost both inward and outward FDI. Local firms should learn from foreign multinationals to build capacity and later invest abroad, which—driven by rising GDP per capita—would shift them to higher IDP stages.
COVID-19 and Corporate Finance (2022)	Marco Pagano and Josef Zechner	26 coutnries, 4000 firms	2020 – 2021	Leverage, liquidity, debt issuance, cash holdings, stock returns	Panel regression and comparative analysis of firm	Corporate Finance under Financial Constraints	During the pandemic, firms increased cash holdings and leverage to secure liquidity, stronger effect in financially constrained firms, equity issuance declined while debt financing rose.

Covid-19 Uncertainty and Corporate Risk-Taking: International Evidence (2024)	Md Showaib Rahman Sarker	71 countries, 25940 firms	2020-2022	Corporate risk-taking (leverage change, investment volatility, risk-taking proxies); COVID-19 uncertainty index; firm governance & financial constraint controls	Panel regressions with firm & quarter fixed effects	Uncertainty theory. Risk-taking theory	The uncertainty caused by COVID-19 has increased companies' propensity to risk, especially in high-governance firms, while financially constrained firms have become less risky
Good corporate governance, firm performance and COVID-19 (2024)	Ferdy Putra	Indonesia, 437 firms	2018-2021	firm performance, Independent: audit committee, nomination & remuneration committee, ownership structure	Multiple regression with moderation analysis	Agency Theory & Corporate Governance Theory	Good corporate governance significantly improves firm performance but the COVID-19 pandemic negatively affects performance, but this impact is mitigated by strong governance practices.

Preliminary Methodology

Theoretical Framework

The theoretical idea is based on that the concepts of sanctions as external economic shocks. Sanctions imposed on a country may disrupt trade, financial flows and investment activity, adversely affecting overall economic performance.

These shocks may also be passed on to neighbouring countries, as well as similar economic interests, such as changes in the distribution of foreign direct investment, trade reorientation and regional economic integration. The study assumes that countries with close ties to countries subject to sanctions may experience a change in growth or decline, both internal and external, related to the sanctions.

Data Description

The empirical analysis is based on annual macroeconomic data from the World Bank covering the period from 2011 to 2024. The study is based on a panel of 9 countries selected as

CIS neighbors and members. The dependent variable is foreign direct investment inflows (% of GDP). To explain variations in this indicator, the following variables are considered: trade openness, gross capital formation, inflation, GDP growth, and the logarithm of the official exchange rate. In order to capture more specific external shocks, time dummy variables for 2020 and 2022 are included in the model, reflecting the consequences of the pandemic and military escalation.

Variables Description

Foreign Direct Investment (FDI) – the dependent variable of the study, measured as foreign direct investment, net inflows (% of GDP). This variable reflects the relative scale of inward foreign investment in each country and allows cross-country comparison by expressing inflows as a share of GDP.

Trade Openness (Trade) – measured as Trade (% of GDP). This variable is used to capture the degree of a country's integration into international markets. A more open economy is generally expected to attract more foreign investors due to stronger trade linkages, broader market access, and greater external connectivity.

Gross Capital Formation (GCFG) – measured as gross capital formation (% of GDP). This variable reflects domestic investment activity and capital accumulation. Higher levels of capital formation may indicate better investment conditions, stronger infrastructure development, and improved economic capacity, which can positively influence FDI inflows.

Inflation (Inf) – measured as inflation, consumer prices (annual %). Inflation is included as an indicator of macroeconomic instability and price uncertainty. High inflation may discourage foreign investors by increasing uncertainty, reducing real returns, and weakening confidence in the host economy.

GDP Growth (GDP) – measured as GDP growth (annual %). This variable captures overall economic performance and market dynamics. Higher GDP growth is usually associated with stronger market potential and may encourage foreign investment by signaling favorable economic conditions.

Exchange Rate (ln_exrate) – measured as the natural logarithm of the official exchange rate (LCU per US$, period average). The exchange rate is included to reflect external competitiveness and currency-related investment risk. Exchange-rate instability or depreciation may increase uncertainty for foreign investors and affect the profitability of cross-border investment decisions.

Dummy Variable for 2020 (d2020) – a time dummy equal to 1 for the year 2020 and 0 otherwise. This variable captures the impact of the COVID-19 pandemic as a major global external shock affecting investment activity.

Time dummies (2020, 2022). The year 2020 is a pandemic crisis, while 2022 is a war between Russia and Ukraine 2022). In essence, both show an irregular impact during black swan periods, reflecting the effect on eight emerging economies.

Hypotheses of the study

The Based on the literature mentioned above, the following hypotheses are proposed:
H1: Gross capital formation positively affects FDI inflows.
H2: Exchange rate instability negatively affects FDI inflows.
H3: External shocks in 2020 and 2022 are associated with lower FDI inflows.

Data and Methodology

Data

This study is based on annual macroeconomic data obtained from the World Bank for the period 2011–2024. The empirical analysis employs a panel dataset covering nine selected CIS and neighboring economies. The sample was chosen based on regional relevance, economic interconnectedness, and the availability of consistent macroeconomic data for the study period.

The dependent variable is foreign direct investment, net inflows (% of GDP), which is used to measure the relative intensity of inward foreign investment across countries. To explain changes in FDI inflows, the model includes a set of macroeconomic variables that are commonly used in the literature on investment determinants and external shocks. These variables are trade openness, gross capital formation**,** inflation**,** GDP growth, and the official exchange rate. In addition, time dummy variables for 2020 and 2022 are introduced in order to capture the effects of major external shocks, namely the COVID-19 pandemic and the geopolitical disruptions associated with the Russia–Ukraine war.

Trade openness is measured by Trade (% of GDP) and is included as an indicator of a country's integration into international markets. Gross capital formation (% of GDP) is used to reflect domestic investment activity and capital accumulation. Inflation, consumer prices (annual %) is included to capture macroeconomic instability and price-level uncertainty. GDP growth (annual %) is used as a proxy for overall economic performance and market attractiveness. The exchange rate variable is measured by the official exchange rate (LCU per US$, period average) and is transformed into its natural logarithm in order to reduce scale differences across countries and improve interpretability.

Thus, the dataset is structured as a panel with country-level annual observations, which makes it suitable for analyzing both cross-country variation and time dynamics in FDI inflows.

Methodology

The empirical analysis is conducted in Stata using panel data econometric techniques. Since the study examines several countries over multiple years, panel regression is appropriate because it allows the analysis to control for both time variation and unobserved country-specific characteristics.

The baseline empirical model is specified as follows:

$$FDI = \beta_0 + \beta_1 Trade + \beta_2\ ExRate + \beta_3\ GCFG + \beta_4\ Inf + \beta_5\ GDP + \beta_6 2020 + \beta_7 2022 + \varepsilon$$

FDI: Foreign direct investment, net inflows (% of GDP)
Trade: trade openness, measured as Trade (% of GDP)
ExRate: Official exchange rate (LCU per US$, period average)
GCFG: gross capital formation (% of GDP)
Inf: Inflation, consumer prices (annual % growth)
GDP: GDP (annual % growth)
2020, 2022: Time dummies
E: Error

The results indicate that gross capital formation is the most stable determinant of FDI inflows across all estimated specifications. Its coefficient remains positive and statistically significant in the conventional random effects model, the random effects model with clustered standard errors,

and the FGLS model. This suggests that higher domestic capital accumulation is associated with stronger foreign investment inflows.

The dummy variable for 2020 is negative across all models, indicating a decline in investment activity during the pandemic period, although its statistical significance weakens after correcting standard errors. The 2022 dummy does not show robust significance across specifications. Trade openness, inflation, GDP growth, and the exchange rate do not remain statistically significant in the preferred corrected random effects models.

EMPIRICAL RESULTS

Descriptive statistics

Table 1 reports the descriptive statistics for all variables included in the empirical analysis. The dependent variable, foreign direct investment inflows (% of GDP), shows noticeable variation across countries and years, indicating differences in the relative intensity of inward foreign investment within the sample. Similar variation is observed for trade openness, gross capital formation, inflation, GDP growth, and the logarithm of the exchange rate.

Among the explanatory variables, inflation demonstrates relatively high dispersion, which reflects the macroeconomic instability experienced by some countries during the study period. The exchange rate variable also shows substantial variation, which justifies its logarithmic transformation in the empirical model. Overall, the descriptive statistics suggest that the panel dataset contains sufficient cross-country and time variation to support panel regression analysis.

Table 1

Variable	Obs	Mean	Std. Dev.	Min	Max
FDI	126	2.880278	2.895401	-5.677737	17.13123
Trade	125	81.41492	30.0295	29.1923	157.9743
GCFG	125	27.09222	5.761373	12.00371	44.68945
Inf	117	8.395049	7.972114	-1.403608	59.21974
GDP	126	3.810909	3.899545	-8.275978	13.93
ln_exrate	124	3.73682	2.573668	-.6982334	9.445593
d2020	126	.0714286	.2585675	0	1
d2022	126	.0714286	.2585675	0	1

Correlation

Table 2 presents the pairwise correlation matrix for the variables used in the model. The results show that the correlations among the explanatory variables are generally low to moderate. No pairwise correlation appears sufficiently high to indicate a serious multicollinearity problem.

In particular, the correlation coefficients between the main regressors remain below levels that would raise major concerns for estimation. This preliminary result is further confirmed by the multicollinearity diagnostics reported in the next subsection.

Table 2

	FDI	Trade	ExRate	GCFG	Inf	GDP	d2020	d2022
FDI	1.0000							
Trade	0.1782	1.0000						
ExRate	-0.0551	-0.2617	1.0000					
GCFG	0.2724	0.1576	0.3932	1.0000				
Inf	0.0566	0.2601	0.1207	0.3201	1.0000			
GDP	0.0722	-0.0005	0.1973	0.2014	-0.0582	1.0000		
d2020	-0.1803	-0.0963	0.0553	-0.0209	-0.1023	-0.5204	1.0000	
d2022	-0.1622	0.0771	0.0687	-0.0672	0.2319	-0.0244	-0.0748	1.0000

Multicollinearity

First, we should test our model for the multicollinearity issue to make sure that independent variables are not highly correlated with each other. The (estat vif) function, which states variance inflation factors, was used for diagnosis.

Mean VIF	1.3

To assess the possibility of multicollinearity, the Variance Inflation Factor (VIF) test was applied after the baseline regression. The results indicate that all VIF values are well below the commonly accepted threshold of 5, and the mean VIF equals 1.30. Therefore, there is no evidence of serious multicollinearity among the explanatory variables. This suggests that the regressors do not exhibit excessive linear dependence and can be included jointly in the estimated model without creating major distortions in coefficient estimates.

Heteroscedasticity

After multicollinearity, heteroscedasticity test should be done. It helps identify whether variance of the errors differs across panels. Then, if some units have higher or lower error variance, then it means inefficient estimates presents. The Modified Wald test for groupwise heteroskedasticity was used to examine whether the variance of the error term differs across panels. The null hypothesis of homoskedasticity was rejected at the 1% significance level (Prob > chi2 = 0.0000), indicating the presence of heteroskedasticity across panels.

This result implies that the standard errors from a conventional panel regression may be inefficient. Therefore, corrected estimators were considered in the final empirical specification.

chi2 (5)	7296.2
Prob>chi2	0.0000

Autocorrelation

The Wooldridge test for autocorrelation in panel data was employed to detect first-order serial correlation in the residuals. The null hypothesis of no first-order autocorrelation was rejected, which indicates the presence of autocorrelation within panels.

The detection of serial correlation implies that estimation methods robust to within-panel dependence should be preferred in the final analysis.

F(1,8)	11.050
Prob>F	0.0024

Hausman test

To determine the appropriate panel specification, both fixed effects and random effects models were estimated. The Hausman test with the sigmamore option did not reject the null hypothesis of no systematic difference between fixed and random effects estimators ($p = 0.174$). Therefore, the random effects specification was considered acceptable for the final model. However, since the diagnostic tests indicated autocorrelation and heteroskedasticity, the model was estimated with corrected standard errors for robustness.

However, since the diagnostic tests revealed both heteroskedasticity and autocorrelation, the study does not rely on the conventional random effects model alone. Instead, corrected specifications are reported in order to improve the reliability of the estimates.

F(1,8)	8.99
Prob>F	0.1740

Random effect

Table 3 reports the results of the random effects model with clustered standard errors. This specification is used as the main empirical model because the Hausman test supported the random effects approach, while the clustered standard errors help address heteroskedasticity and within-panel dependence.

The results show that gross capital formation has a positive and statistically significant effect on FDI inflows. This finding is consistent with the expectation that stronger domestic capital accumulation is associated with greater investment attractiveness and improved conditions for foreign investors.

The coefficient of the 2020 dummy variable is negative, which suggests lower FDI inflows during the pandemic period. However, its statistical significance is relatively weak in the corrected specification. The 2022 dummy variable also has a negative sign, but it does not remain statistically significant.

Trade openness, inflation, GDP growth, and the logarithm of the exchange rate do not show statistically significant effects in the preferred corrected random effects model. Therefore, their influence on FDI appears less robust in the final specification.

FDI	Coef.	Std. Err.	z	P>z	[95% Conf. Interval]	
Trade	.0134629	.0135286	1.00	0.320	-.0130527	.0399784

GCF	.1850028	.0824419	-0.24	0.025	.0234196	.346586
Inf	-.0057066	.0241711	-0.24	0.813	-.0530811	.041668
GDP	-.1034664	.1446527	-0.72	0.474	-.3869805	.1800477
ln_exrate	-.0955094	.1196496	-0.80	0.425	-.3300183	.1389996
d2020	-2.81196	1.516539	-1.85	0.064	-5.784321	.1604014
d2022	-1.910657	1.339829	-1.43	0.154	-4.536673	.7153583
_cons	-2.000185	1.418113	-1.41	0.158	-4.779637	.7792659

FGLS

As an additional robustness check, the model was re-estimated using Feasible Generalized Least Squares (FGLS) with heteroskedastic panels and a common AR(1) correlation structure. This approach is appropriate given the earlier evidence of heteroskedasticity and autocorrelation in the panel dataset.

The FGLS results confirm that gross capital formation remains positive and statistically significant. This consistency across alternative specifications suggests that the positive role of domestic capital accumulation is the most stable empirical finding of the study.

At the same time, the coefficients of trade openness, inflation, GDP growth, the exchange rate, and the time dummies do not remain statistically significant in the FGLS model. In particular, the 2022 dummy variable changes sign and remains insignificant, which indicates that the effect of this shock is not robust across specifications.

FDI	Coef.	PCSE Std. Err.	z	p-value	95% CI Lower	95% CI Upper
Trade	.0099988	.0078817	1.27	0.205	-.005449	.0254467
GCFG	.1085896	.0310428	3.50	0.000	.0477468	.1694324
Inf	-.0115195	.0243981	-0.47	0.637	-.059339	.0362999
GDP	.0082614	.0411471	0.20	0.841	-.0723854	.0889083
exrate	-.1129635	.0840472	-1.34	0.179	-.2776929	.0517659
2020	-.9671445	.6526604	-1.48	0.138	-2.246335	.3120463
2022	.244854	.5741101	0.43	0.670	-.8803811	1.370089
cons	-.5295189	1.153305	-0.46	0.646	-2.789955	1.730917

FGLS estimation was performed with heteroskedastic panels and a common AR(1) correlation structure.

Statistic	Value
Number of observations	115
Number of groups (ID)	9
Obs per group (min/avg/max)	6 / 12.778 / 14
Panels	heteroskedastic

Statistic	Value
Correlation	common AR(1)
common AR(1)	0.3291
Estimated covariances	9
Estimated autocorrelations	1
Estimated coefficients	8
Wald $\chi^2(7)$	23.62
Prob > χ^2	0.0013

Summary of Hypotheses

As the empirical results showed, not all hypotheses were viable. Hypothesis 1, which asserts that gross capital accumulation has a positive effect on FDI inflows, is supported by the regression results. Hypothesis 2, which predicts the negative impact of exchange-rate instability on FDI inflows, it isn't supported by reliable support in preferred corrected specifications. Hypothesis 3, which asserts that external shocks in 2020 and 2022 are associated with lower FDI inflows, receives only partial support, as the 2020 is still negative but of little significance, while the 2020 is not reliably significant for all models.

Conclusion

The results show that gross capital formation is the only reliable and statistically significant determinant of FDI inflows. It can be assumed that countries that develop investments domestically are more effective in attracting foreign capital, because if the state is interested in development itself, and investors from abroad see opportunities in stability, a well-developed economy and in an excellent geographical location regardless of the conditions of crisis impacts. Thus, the positive effect of gross capital formation remained stable under the conventional random effects model, corrected specification with clustered standard errors and FGLS robustness check.

Regarding the hypotheses, H1 is supported - gross capital formation positively and significantly affects FDI inflows. H2 is not supported - the exchange rate variable does not show a statistically significant effect in preferred adjusted models. H3 is not supported. The dummy variable for 2020 is consistently negative across all specifications, after corrections it does not reach the usual thresholds of significance, and the dummy variable for 2022 is not significant at all.

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Curated Media Environments in Kazakhstan: Ethnicity, Language, and the Structuring of Information Flows

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ABSTRACT

Media environments have become an important issue in multilingual and multiethnic societies, where exposure to information is often influenced not only by personal choice, but also by language and group belonging. In the case of Kazakhstan, this question is especially relevant because the country contains both Kazakh-language and Russian-language media spaces whereas ethnicity and language remain meaningful in social and political life. In the light of this, the study examines whether ethnicity and survey language are associated with differences in curated media environments in Kazakhstan. The research draws on social identity theory and selective exposure to explore how respondents are positioned in relation to Western-oriented and Russian-oriented information flows, as well as broader dimensions such as echo chamber tendencies and media trust. Using nationally representative secondary survey data, the study applies both separate-effects and combined-group models, since survey language is closely interconnected with ethnicity. The findings suggest that ethnicity and survey language are related to several dimensions of media environments. In particular, ethnic Kazakh and Kazakh-language respondents show higher exposure to Western-oriented information environments whereas Russian-oriented exposure follows a more mixed pattern across groups. Overall, the study argues that media environments in Kazakhstan are shaped not only by individual media choice, but also by broader ethnolinguistic patterns of identity and belonging.

KEYWORDS: ethnicity, language, social identity, selective exposure, curated media environments, echo chambers, media trust, Kazakhstan

1. INTRODUCTION

In the current era of the digital environment, media plays an important role in shaping how people understand politics, society, and public life. Information does not reach people in a fully random way. Individuals are often exposed to sources that are more familiar, more accessible, and more closely connected to their language, identity, and daily social surroundings. For this reason, media environments should not be viewed as neutral spaces, since they may reflect broader social patterns of both belonging and division (Tajfel & Turner, 1979; Huddy, 2001).

This issue is especially relevant in multilingual and multiethnic societies, where language is viewed not only as a tool of communication, but also as an indicator of identity and social orientation. In such conditions, people may be more likely to engage with information that feels linguistically comfortable and socially meaningful to them. As a result, differences in language and ethnicity may shape not only what kinds of information individuals consume, but also how they

relate to media in general, including which sources they trust and how homogeneous their information environment becomes (Strömbäck et al., 2020; Ognyanova, 2019).

Kazakhstan provides an especially relevant case for examining this question. As a multilingual and multiethnic country, containing both Kazakh-language and Russian-language media spaces, in which ethnicity and language continue to have political and social importance. In this context, it is useful for exploring whether ethnolinguistic identity is associated with differences in media environments. The case is important not only because of the coexistence of multiple media spheres, but also because questions of language, belonging, and national identity remain closely connected to broader public and political life (Dave, 2007; Rees & Burkhanov, 2018).

The problem of this study lies in the fact that although existing scholarship has paid considerable attention to identity, language politics, nationalism, and media choice, there is still limited research on how these factors come together in shaping media environments in Kazakhstan. Research on Kazakhstan explains well why ethnicity and language matter in relation to nation-building and identity. At the same time, scholarship on selective exposure helps explain why individuals do not encounter information randomly (Stroud, 2011). However, less attention has been paid to the relationship between ethnolinguistic identity and patterns of information consumption in the Kazakhstani context. This gap is significant because media environments are one of the spaces for individuals to encounter politics, foreign narratives, and public debate.

In the light of the above, this study examines whether ethnicity and survey language are associated with curated media environments in Kazakhstan. More specifically, it explores whether these factors are related to Western-oriented and Russian-oriented information flows, as well as to broader dimensions of media engagement such as echo chamber tendencies and media trust. The study employs social identity theory and selective exposure to understand how language and ethnicity may structure access and orientation towards different informational environments.

The study uses nationally representative secondary survey data from Kazakhstan. Since survey language is closely interconnected with ethnicity, the analysis applies both separate-effects and combined-group models. Overall, the study argues that media environments in Kazakhstan are shaped not only by individual media preferences, but also by broader ethnolinguistic indicators of identity and belonging. The study contributes to existing research of media choice and selective exposure by showing how these processes operate in a multilingual and multiethnic context.

2. LITERATURE REVIEW

The literature review develops the theoretical framework of the study by combining three dimensions of scholarship. Firstly, it examines research on identity, language, and group-based information choice. Next, it focuses on selective exposure and curated media environments. Lastly, it considers literature on nationalism, language politics, and identity in Kazakhstan. Overall, these perspectives help explain why ethnicity and language may be associated with different media environments in the Kazakhstani context.

2.1 Identity, Language, and Group-Based Information Choice

The matter of identity has often been important in social and political research because individuals do not exist only as separate persons, but also as members of larger groups. The way people see themselves is often connected to communities to which they feel belonging, and these attachments can influence how they interpret events and make daily choices. For this reason,

scholarship on identity is helpful to understand behavior that might be perceived as individual, but it is shaped by broader social belonging.

One of the most influential approaches in the field is social identity theory. In the classic work of Tajfel and Turner (1979), social identity is understood as part of an individual's self-concept that comes from membership in meaningful social groups. It means that people do not just classify other people, but also themselves. Such identification influences perception, evaluation, and behavior. Later research develops this idea further by showing that identity is not only social in general, but also political. Greene (2004) and Huddy (2001) argue that group belonging shapes the way individuals interpret political information, define interests, and distinguish between in-groups and out-groups.

This perspective is appropriate in situations where ethnicity and language carry social and political meaning. In many societies, these categories are not neutral indicators because of their connection to recognition, status, familiarity, and everyday belonging. In this regard, ethnicity and language may shape not only formal political attitudes, but also more ordinary orientations, such as what feels understandable or close to someone's own experience. Brewer (1999) makes an important point by stating that group attachment should not be understood only as hostility towards strangers. Identification can reflect positive attachment to an individual's own group, its symbols and practices. Likewise, Leach et al. (2008) consider that identification is not one-dimensional since its meaning can vary across conditions, which helps to explain why some identity indicators become more noticeable than others.

These arguments are important for the study because they suggest that information choice may also be shaped by group belonging. Media use is often treated as a matter of habit or preference; however, identity-based approaches suggest that people might be prone towards information sources that feel more familiar, trustworthy, or more socially relevant. In a multilingual environment, it becomes even more significant because language is not only an instrument of interaction. It can reflect a person's place in a wider social system. As a result, language and ethnicity may influence which sources individuals turn to, which messages seem credible, and which media environments become part of their everyday informational space.

Overall, the literature on social identity helps to build an important foundation for this study. It suggests that ethnicity and language may matter not only because they shape self-understanding, but also because they may influence how people navigate information. Media choices are not dependent directly on identity. However, identity can become one of the factors that structure patterns of media exposure and orientation.

2.2. Selective Exposure, Reinforcement, and Curated Media Environments

Research on media choice has argued that people do not engage with information in a fully random way since people are often more likely to select sources and platforms that are closer to their prior views, habits, and social orientations. The idea is central to the literature on selective exposure, which suggests that media use reflects motivated patterns of choice rather than neutral or accidental engagement with information (Iyengar & Hahn, 2009; Stroud, 2011). From this perspective, media environments are not just external algorithms in which audiences passively receive information. They are also shaped through repeated choices based on what to follow, what to ignore, and what to return to over time.

On the other hand, selective exposure should not be limited only to the avoidance of opposing views. The important contribution of this theory is the argument that people are often motivated

not just by discomfort with disagreement, but by the tendency to seek confirming information. Garrett (2009) states that people may actively seek content that supports their existing orientations. It means that media choice is not only defensive, but also affirmative: people may turn to certain sources because those sources strengthen what they already believe in. Similarly, the reinforcing spirals framework by Slater (2007) explains that media selection and identity can influence each other over time. People choose certain kinds of media because those sources align with their existing views, and repeated exposure to those sources can then strengthen the orientations shaped by original choice. Media use is a dynamic process rather than a single act of selection.

These arguments are essential in the digital cases, where individuals are exposed to diverse content but are also able to personalize their informational spaces more easily than before. Online environments make it possible to follow preferred accounts, block unnecessary content, leave or unsubscribe from sources, and remain within spaces that feel familiar and comfortable. Therefore, digital media can contribute to the formation of patterned and internally consistent information environments. People do not live in completely closed informational worlds, but it suggests that media exposure may become structured and differentiated. Flaxman, Goel, and Rao (2016) make a useful point here by showing that online news use can produce different patterns of exposure even with not complete fragmentation.

Overall, this literature helps to explain how broader identity-related processes may be reflected in concrete media environments. If people are more likely to select information that feels familiar, trustworthy, or consistent with their social orientation, then media exposure is likely to vary across groups rather than be more random. Selective exposure provides the bridge between identity and media use. It helps in explaining why differences in ethnicity and language may be associated not only with different directions of information flow, but also with broader features of media environments, including echo chamber tendencies and media trust.

2.3 Nationalism, Language Politics, and Identity in Kazakhstan

The broader theoretical arguments discussed above are relevant in the case of Kazakhstan, where questions of ethnicity, language, and nation-building have been important since independence. Kazakhstan is a valuable case not only because it is multilingual and multiethnic, but also because identity in the country has developed in connection with state-building, demographic change, and debates over belonging. As was mentioned before, language is not only a tool of communication, as it is also tied to status, symbolic recognition, and the way the nation has been imagined and negotiated in public life.

Earlier scholarship on post-Soviet Kazakhstan shows that ethnicity and language were among central debates on state formation and national integration from the beginning of independence. Bremmer (1994) and Kolstø (1998) emphasize that ethnic relations, demographic expectations, and the future position of different groups were closely connected with early concerns about nation-building. Additionally, Dave (2007) states that language and power remained deeply interconnected in Kazakhstan's political and social development. In this case, ethnolinguistic identity should not be treated as a secondary or background issue because it has been one of the main ways to reflect on questions of citizenship, belonging, and political status.

This scholarship is important as it demonstrates that Kazakhstan's identity politics cannot be limited just to an ethnic divide. Likewise, it also makes clear that ethnicity and language have continued to matter in a way that they are linked to broader social hierarchies, patterns of

recognition, and public understandings of sense of belonging to the nation. It shows how the politics of language in Kazakhstan is in close connection with the politics of identity.

More recent research adds another important direction by highlighting that identity in Kazakhstan is layered rather than fixed. Rees and Williams (2017) argue that Kazakhstani identity reflects a combination of ethnicity, language, citizenship, and cross-ethnic belonging. It suggests that identity in Kazakhstan does not operate through only one category as individuals may relate to the state and to one another through several overlapping forms of belonging. Rees and Burkhanov (2018) argue that official narratives of nationhood often try to broaden inclusion, even while ethnocultural indicators are important. In addition to that, Sharipova, Burkhanov, and Alpeissova (2017) emphasize that both civic and ethnic forms of nationalism are present at the local level and vary across social groups.

It is important to mention that from this literature identity is not presented as entirely fragmented in Kazakhstan, but that it is complex and socially significant. The country's political and symbolic landscape reflects ongoing negotiation between civic inclusion, ethnocultural meaning, and linguistic differences. Therefore, ethnicity and language remain important aspects through which people may also understand their own position within the nation. The point matters for the study because if ethnolinguistic identity continues to shape social orientation in Kazakhstan, it may also influence how individuals engage with information and media.

This perspective shows media environments as one of the spaces where broader identity dynamics becomes visible in everyday life. If language and ethnicity remain valuable in structuring belonging, then they may also affect which sources of information appear more familiar, more legitimate, or more trustworthy. People may not consciously choose media only because of identity, but identity may still shape the broader informational space in which those choices take place. In particular, it is appropriate in Kazakhstan, where different language environments can also correspond to different symbolic and geopolitical orientations.

Overall, the Kazakhstani literature provides a strong foundation for understanding nation-building, language politics, and identity formation. However, it focuses less on how these broader dynamics are reflected in everyday media environments. In other words, it is known how ethnicity and language matter in relation to the nation, but there is less about how they may matter in relation to patterns of information exposure, media trust, and more homogeneous informational conditions. This study contributes to the research by linking the Kazakhstani literature to research on selective exposure and media choice. The study examines whether ethnolinguistic identity is associated with different patterns of information flow and broader media orientations in Kazakhstan.

2.4 HYPOTHESES

H1. Ethnicity and survey language will each be associated with curated media environments in Kazakhstan.

H2. Ethnic Kazakh respondents and respondents who completed the survey in Kazakh will report greater exposure to Western-oriented information environments.

H3. Non-Kazakh respondents and respondents who completed the survey in Russian will report greater exposure to Russian-oriented information environments.

H4. Respondents who are both ethnically Kazakh and Kazakh-language users will report the highest level of Western-oriented information exposure.

H5. Ethnicity and survey language will also be associated with broader dimensions of media environments, including echo chamber tendencies and media trust.

3. DATA AND METHODS

This section describes the data, key measures, and analytical strategy used to examine whether ethnicity and survey language are associated with curated media environments in Kazakhstan. It first outlines the case, data source, and unit of analysis, then defines the main variables, and finally explains the research approach.

3.1 Case, Data, and the Unit of Analysis

The study focuses on Kazakhstan as a multilingual and multiethnic society in which ethnicity and language continue to shape broader questions of identity and belonging. Such context makes Kazakhstan a relevant case to analyze whether differences in ethnolinguistic background are reflected in diverse patterns of media exposure. The coexistence of Kazakh-language and Russian-language media spaces is particularly important in this case since it creates a situation in which respondents may be oriented toward different informational environments.

The analysis is based on nationally representative secondary survey data from the Central Asia Barometer, Kazakhstan, 2023 (Web-1). The unit of analysis is the individual respondent to examine whether ethnicity and survey language are associated with variation across several media-related outcomes, including information flow, media trust, and echo chamber tendencies

3.2 Key measures

The dependent variables capture several dimensions of media environments. The first two outcomes are Western information flow and Russian information flow, which measure respondents' exposure to different geopolitical sources of information. Higher values indicate greater exposure to the respective information environment.

The analysis also includes two broader outcomes. The first is an echo chamber index, which reflects the extent to which respondents are situated in relatively homogeneous information environments. The index is constructed from indicators of selective exposure and avoidance behavior, including blocking, unfriending, leaving groups, unsubscribing, and reducing exposure to disagreement. Higher values indicate stronger echo chamber tendencies.

The second broader outcome is a media trust index. This variable captures respondents' trust in different types of media, including state media, Russian media, Western media, and online platforms. Higher values indicate a higher average level of trust in these sources.

The main independent variables are ethnicity and survey language. Ethnicity is coded as a binary variable distinguishing ethnic Kazakhs from non-Kazakhs, while survey language distinguishes respondents who completed the survey in Kazakh from those who completed it in Russian.

In addition, the analysis includes a combined-group variable identifying respondents who are both ethnically Kazakh and Kazakh-language users.

3.3 Analytical strategy

The empirical analysis relies on ordinary least squares (OLS) regression models. This approach fits the study because the dependent variables are continuous measures and the goal of the analysis is to estimate patterns of association across respondents while accounting for relevant controls.

Two sets of models are estimated. First, the study applies separate-effects models to analyze the independent relationship of ethnicity and survey language with each outcome. The main focus here is to assess whether each of these factors is associated with media environments on its own.

Second, the study estimates combined-group models to examine whether respondents who are both ethnically Kazakh and Kazakh-language users demonstrate a more distinctive pattern across the outcomes than other respondents. This step is necessary since the structure of the data does not support a standard interaction between ethnicity and survey language. More specifically, the dataset does not include ethnic Russian respondents who completed the survey in Kazakh, which means that the categories are not fully crossed. Under these conditions, a conventional interaction term would not provide a reliable basis for interpretation.

Therefore, the combined-group approach offers a more appropriate way to capture the joint role of ethnicity and language in the study. Although it cannot be interpreted as a full interaction in the formal statistical sense, it does make it possible to assess whether the Kazakh/Kazakh group has distinctions across multiple dimensions of media environments.

4. RESULTS

4.1 Descriptive Patterns Across Ethnicity-Language Groups

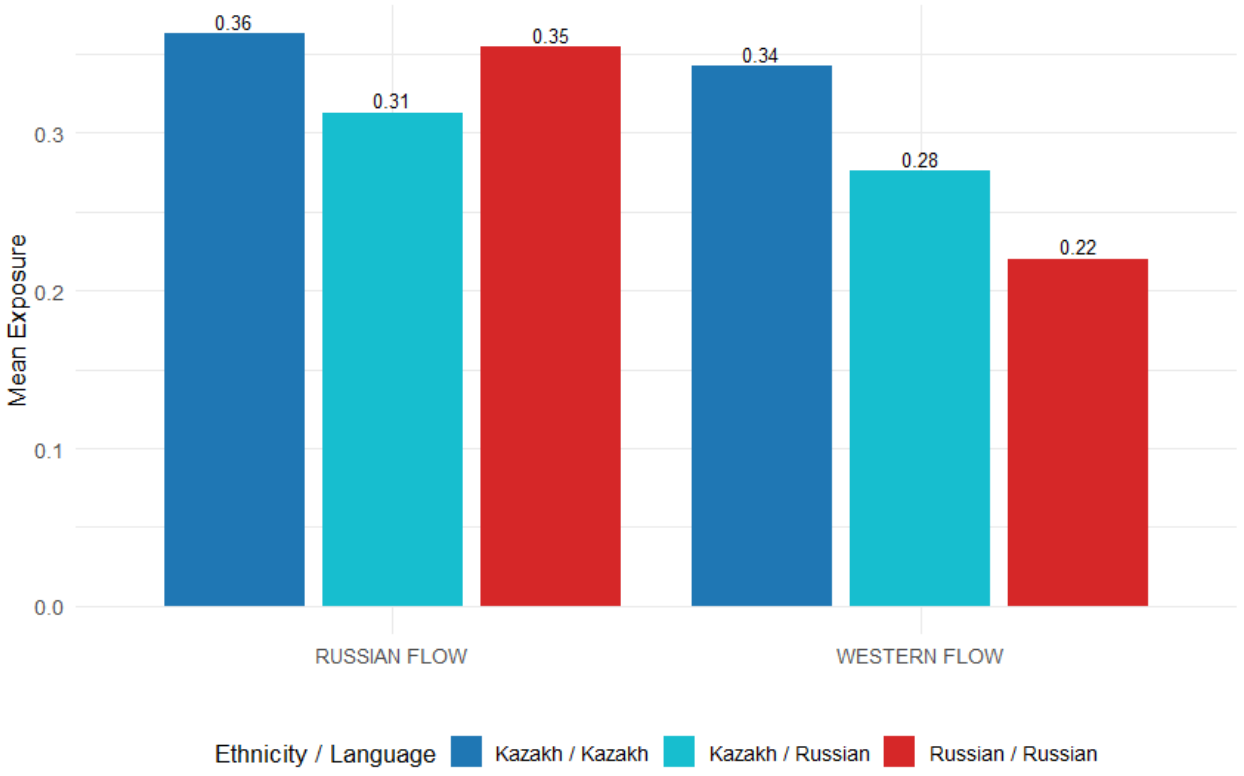


Figure 1. Information flows by ethnicity-language group

Before moving to the regression models, it is useful to look at the descriptive patterns across the ethnicity-language groups. These figures do not prove causality, but they help show the basic direction of the differences and whether the groups appear to stand apart from one another.

Figure 1 presents Western and Russian information flow across the main ethnicity-language groups. As shown in the figure, in the case of Western information flow, the pattern is relatively clear. The Kazakh/Kazakh group reports the highest level of exposure, while the Russian/Russian group reports the lowest. The Kazakh/Russian group is located between these two positions. This aspect already highlights a first indication that both ethnicity and language may matter for Western-oriented exposure.

The pattern for Russian information flow is less predictable. The Russian/Russian group reports the highest level of Russian-oriented exposure, while the Kazakh/Kazakh group appears lower. The intermediate groups fall between these two points. However, the difference here does not look as straightforward as in the previous case. For this reason, Russian information flow already appears more mixed at the descriptive stage.

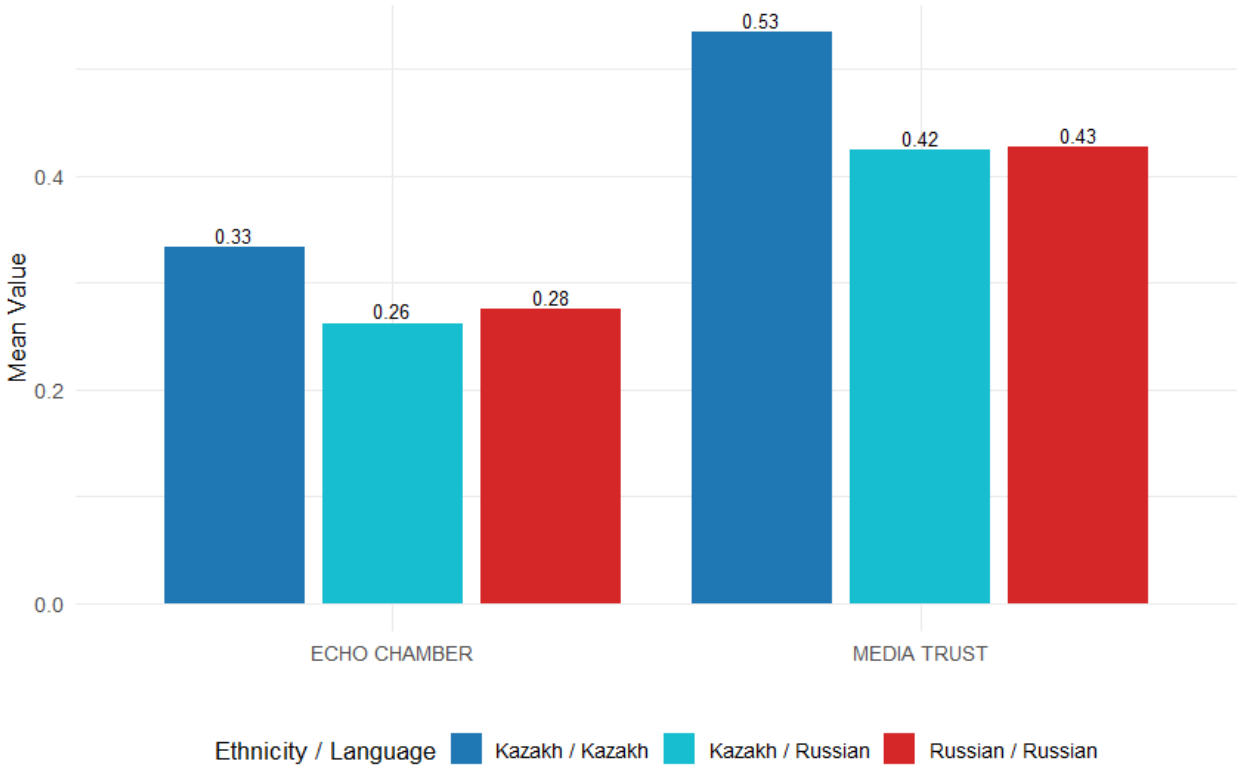


Figure 2. Additional dimensions of curated media environments

Figure 2 broadens the picture by showing echo chamber tendencies and media trust. As in the previous case, the groups do not overlap fully. The Kazakh/Kazakh group appears more distinctive across both outcomes, while the Russian/Russian group tends to occupy a different position. The descriptive evidence points not only to differences regarding the direction of

information flow, but also to differences in the wider character of respondents' media environments.

It is important to emphasize that the descriptive patterns are broadly in line with the expectations of the study. However, these figures are only an initial step. The regression models are necessary to see whether these differences remain essential once other variables are taken into account.

4.2 Separate-Effects Models of Information Flow

Table 1, Columns (1) and (3), presents the separate-effects models for Western and Russian information flow. These models are important because they allow ethnicity and survey language to be considered separately before turning to the combined-group analysis.

The strongest and clearest pattern appears in the model for Western information flow. Both Ethnic KZ and KZ-language are positive and statistically significant. In practical terms, this means that ethnic Kazakh respondents and respondents who completed the survey in Kazakh report higher exposure to Western-oriented information sources than the reference category. This result matters for the main argument as it shows that both ethnicity and language work in the expected direction when the outcome is Western information flow. In this sense, the model supports H1 and H2.

The model for Russian information flow looks different as the coefficient for Ethnic KZ is negative and statistically significant, while the coefficient for KZ-language is positive and statistically significant. This means that ethnicity and language do not move in the same direction in relation to Russian-oriented exposure. On the one hand, ethnic Kazakh respondents report lower levels of Russian information flow. On the other hand, respondents who completed the survey in Kazakh report higher levels of Russian-oriented exposure. This is exactly the point where the analysis becomes more interesting, because the pattern is not just the reverse of Western information flow. For that reason, H3 receives only partial support.

Table 1: Information Flow Models

	Western Flow (Separate)	Western Flow (KZ/KZ)	Russian Flow (Separate)	Russian Flow (KZ/KZ)
Ethnic KZ	0.05***		−0.04***	
	(0.01)		(0.01)	
KZ-language	0.04***		0.04***	
	(0.01)		(0.01)	
Ethnicity & Language		0.07***		0.03**
		(0.01)		(0.01)
Male	0.02**	0.02**	0.02**	0.02**
	(0.01)	(0.01)	(0.01)	(0.01)
Age	−0.11***	−0.10***	−0.03	−0.03
	(0.02)	(0.02)	(0.03)	(0.03)
Village	−0.02	−0.01	−0.003	−0.01
	(0.02)	(0.02)	(0.02)	(0.02)
Education	−0.02	0.01	−0.05*	−0.07***
	(0.03)	(0.03)	(0.03)	(0.03)
Income	0.03**	0.04**	−0.03	−0.03
	(0.02)	(0.02)	(0.02)	(0.02)
Political interest	0.13***	0.13***	0.13***	0.13***
	(0.02)	(0.02)	(0.02)	(0.02)
Baseline	0.19***	0.19***	0.35***	0.35***
	(0.02)	(0.02)	(0.03)	(0.03)
Observations	1062	1062	1062	1062
R^2	0.17	0.15	0.08	0.07
Adjusted R^2	0.16	0.14	0.07	0.06

Note: *p<0.1; **p<0.05; ***p<0.01. Entries are OLS coefficients with standard errors in parentheses. Separate models include ethnicity and language as distinct predictors. KZ/KZ models test whether the combined Kazakh ethnicity/Kazakh-language group is distinctive.

Among the control variables, political interest stands out as one of the most stable predictors in both models. Respondents who are more interested in politics tend to report greater information exposure overall. Age is also noticeable in the Western-flow model, where it is negatively associated with Western-oriented exposure. The remaining controls are less consistent and do not shape the picture as strongly as the main identity variables.

When looking across both models, ethnicity and survey language are clearly relevant for understanding information flow in Kazakhstan. However, they do not operate in exactly the same way across the two outcomes. The relationship is clearer in the case of Western-oriented exposure, while Russian-oriented exposure follows a more complicated pattern.

4.3 Combined-Group Models of Information Flow

Table 1, Columns (2) and (4), presents the combined-group models. These models focus on respondents who are both ethnically Kazakh and Kazakh-language users. This part of the analysis is especially relevant since it helps to show whether the combination of ethnicity and language matters more strongly than either factor considered separately.

In Column (2), the coefficient for the Kazakh/Kazakh group is positive and statistically significant for Western information flow. This means that respondents in this group report higher exposure to Western-oriented information than other respondents. Compared with the earlier models, this result strengthens the view that the Kazakh/Kazakh group is distinct in relation to Western-oriented media exposure. Thus, H4 is supported.

Column (4) shows that the same combined group is also positively and significantly associated with Russian information flow, although the coefficient is smaller than in the Western-flow model. The point is important because it shows that the Kazakh/Kazakh group is not distinctive only in one direction. Likewise, the smaller magnitude makes clear that Russian-oriented exposure should not be understood as a direct mirror image of the Western-flow result.

It becomes visible that ethnicity and language should not be treated as fully separate dimensions in the Kazakhstani case. Their combination also matters as the findings suggest that respondents who are both ethnically Kazakh and Kazakh-language users have a more distinctive position within the broader media structure than other respondents. Since the data do not support a conventional interaction term, the combined-group approach offers a more suitable way to analyze this relationship.

In this part of the analysis, the broader argument of the study becomes clearer. Ethnicity and language matter not only in separate ways. The joint position of the Kazakh/Kazakh group also appears valuable for understanding information flow in Kazakhstan.

4.4 Echo Chamber Tendencies and Media Trust

Table 2 extends the analysis beyond Western and Russian information flow. It turns to two broader outcomes: echo chamber tendencies and media trust. This part of the study is significant because it shows whether ethnicity and language are related not only to what kind of information respondents consume, but also to how their broader media environment is structured.

Starting with echo chamber tendencies, Column (1) shows that KZ-language is positive and statistically significant, while the coefficient for Ethnic KZ is not statistically significant. In other words, language appears to matter more consistently than ethnicity in explaining whether respondents are located in relatively homogeneous information settings. Column (2) points in the same direction. The combined Kazakh/Kazakh group is also positively and significantly associated with echo chamber tendencies. It means that the role of identity is considerable not only in information flow, but also in the internal character of respondents' media environments.

Table 2: Curated Media Environments: Echo Chambers and Trust

	Echo Chamber (Separate)	Echo Chamber (KZ/KZ)	Media Trust (Separate)	Media Trust (KZ/KZ)
Ethnic KZ	−0.02		−0.00	
	(0.01)		(0.01)	
KZ-language	0.04**		0.08***	
	(0.02)		(0.02)	
Ethnicity & Language		0.03**		0.08***
		(0.02)		(0.01)
Male	0.03**	0.03**	0.01	0.01
	(0.01)	(0.01)	(0.01)	(0.01)
Age	−0.14***	−0.14***	−0.13***	−0.13***
	(0.03)	(0.03)	(0.03)	(0.03)
Village	−0.02	−0.02	−0.00	−0.00
	(0.02)	(0.02)	(0.02)	(0.02)
Education	0.02	0.01	0.01	0.01
	(0.03)	(0.03)	(0.03)	(0.03)
Income	0.02	0.02	−0.01	−0.01
	(0.02)	(0.02)	(0.02)	(0.02)
Political interest	0.16***	0.16***	0.07***	0.07***
	(0.02)	(0.02)	(0.02)	(0.02)
Baseline	0.22***	0.22***	0.43***	0.43***
	(0.03)	(0.03)	(0.03)	(0.03)
Observations	1062	1062	1062	1062
R^2	0.10	0.10	0.08	0.08
Adjusted R^2	0.09	0.09	0.08	0.08

Note: *p<0.1; **p<0.05; ***p<0.01. Entries are OLS coefficients with standard errors in parentheses. These models extend beyond information exposure to broader media environments.

The media trust models have even more clear patterns. In Column (3), Kazakh-language respondents report significantly higher levels of media trust, while ethnicity on its own is again not statistically significant. Column (4) strengthens this result by showing that the Kazakh/Kazakh group is also positively and significantly associated with media trust. Therefore, the combined role of ethnicity and language becomes especially visible.

When the two outcomes are viewed together, a common pattern appears. Language is more consistent than ethnicity alone, while the Kazakh/Kazakh group remains distinctive across both models. On the other hand, the differentiation is somewhat stronger in the media trust models, where the result appears more stable and clear.

Overall, these findings support H5 and reinforce the broader argument of the study that ethnicity and survey language are associated not only with information flow, but also with broader dimensions of media environments in Kazakhstan.

5. CONCLUSION

This study examined whether ethnicity and survey language are associated with media environments in Kazakhstan. The results suggest that there is a relationship between them. Across the models, ethnicity and language were linked to differences in information flow, echo chamber tendencies, and media trust. The strongest pattern appeared in relation to Western-oriented information flow, where ethnic Kazakh respondents and respondents who completed the survey in Kazakh reported higher exposure. Russian-oriented information flow was more mixed and did not follow the same pattern. However, the combined Kazakh/Kazakh group appeared highly different across several outcomes. The findings point to a broader conclusion that media environments in Kazakhstan are shaped not only by individual media choice, but also by broader ethnolinguistic patterns.

From a theoretical point of view, these findings contribute to research on social identity and selective exposure (Tajfel & Turner, 1979; Slater, 2007). The study states that the role of identity is not limited just to political attitudes or symbolic belonging. It can also be seen in the informational space through which people interact with politics or public debate. The point is vital in the Kazakhstani case, where language and ethnicity are socially relevant and where different media spaces may reflect broader patterns of belonging. The study expands selective exposure research beyond contexts shaped mainly by party identity through examining it in multilingual and multiethnic contexts.

The findings also have broader implications. They suggest that media environments in Kazakhstan are not fully random or socially neutral. That is to say individuals are not divided into completely separate media spaces. However, findings suggest that trust in media, orientation towards different information flows, and the degree of homogeneity in a person's media environment are shaped in part by ethnicity and language (Strömbäck et al., 2020; Ognyanova, 2019). This makes the question of ethnolinguistic identity important not only for nation-building or symbolic politics, but also for daily information exposure.

On the other hand, the study has several limitations. First, the analysis is based on observational survey data, so the findings should be read as associations rather than causal relationships. Second, the dataset does not support a standard interaction between ethnicity and survey language, since there are no ethnic Russian respondents who completed the survey in Kazakh. Thus, the combined-group approach was used as a more suitable alternative, but it also limits the kinds of comparisons that can be made. Third, the outcomes analyze media environments indirectly through measures of information flow, echo chamber tendencies, and media trust, rather than through direct observation of media behavior itself.

Future research could develop this argument further in several ways. One possible direction would be to use more detailed behavioral or platform-specific data in order to examine how these patterns appear in day-to-day media use. Another would be to explore whether similar relationships can be found in other multilingual societies where language and identity remain politically important. Overall, the findings of this study suggest that understanding media environments requires attention not only to platforms and content, but also to the social and linguistic identities through which people orient themselves in the informational sphere.

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The Determinants of FDI in New BRICS Countries

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Abstract

This study analyzes the determinants of Foreign Direct Investment (FDI) in the New BRICS countries — Brazil, Russia, India, China, South Africa, Egypt, Ethiopia, Iran, and the United Arab Emirates — over the period 2004–2023. The Eclectic Paradigm (OLI model) proposed by John Dunning serves as the theoretical foundation, emphasizing Ownership, Location, and Internalization advantages that shape cross-border investment decisions.

The dependent variable is FDI net inflows (% of GDP). Ten independent variables are examined: Access to Electricity, Control of Corruption, GDP, High-technology Exports, Logistics Performance Index, Official Exchange Rate, Political Stability and Absence of Violence, Regulatory Quality, Research and Development Expenditure, and Trade Openness. Annual data were sourced from the World Bank Database.

Diagnostic tests confirmed no multicollinearity (mean VIF = 7.75) and no heteroscedasticity, but revealed autocorrelation at the 10% level of significance. Feasible Generalized Least Squares (FGLS) was therefore employed as the primary estimation method.

The FGLS results show that GDP, Trade Openness, Access to Electricity, Political Stability, and Regulatory Quality are statistically significant and positively associated with FDI inflows. High-technology Exports, Logistics Performance Index, Official Exchange Rate, Control of Corruption, and R&D Expenditure did not reach statistical significance. These findings underscore the importance of macroeconomic size, openness, infrastructure, institutional quality, and political stability in attracting foreign investment to New BRICS economies.

Keywords

Foreign Direct Investment, BRICS, New BRICS, Eclectic Paradigm, OLI model, panel data, FGLS, trade openness, political stability, regulatory quality, economic growth

Introduction

Foreign Direct Investment plays a fundamental role in driving economic growth, technology transfer, and employment, particularly in emerging and developing economies. The BRICS association — founded in 2006 and originally comprising Brazil, Russia, India, China, and South Africa — expanded in 2024 to include Egypt, Ethiopia, Iran, and the United Arab Emirates, bringing the total membership to nine countries. This expansion creates a compelling research opportunity to examine what factors attract FDI across a group that now spans four continents, multiple governance systems, and diverse levels of economic development.

In both developed and developing contexts, FDI facilitates access to global markets, supports infrastructure development, and integrates host economies into international value chains. For developing and transitioning economies — such as the New BRICS members — FDI serves as a catalyst for capital inflows, productivity improvements, and economic diversification.

Understanding what drives FDI to these countries is therefore a priority for policymakers and investors alike.

Despite the growing body of literature on FDI determinants in the original five BRICS nations, the economic and institutional dynamics of the four new members remain largely underexplored. This study addresses that gap by analyzing the determinants of FDI across all nine BRICS countries for the period 2004–2023, applying the OLI framework and robust panel econometric techniques.

Research Problem

What are the key macroeconomic, infrastructural, and institutional determinants of FDI inflows in the New BRICS countries over the period 2004–2023?

Existing literature extensively examines FDI determinants for the traditional BRICS five, but provides limited empirical coverage of the new members — Egypt, Ethiopia, Iran, and the UAE. These economies differ substantially in their governance quality, infrastructure levels, trade openness, and political environments. A comprehensive analysis combining macroeconomic, infrastructural, and institutional variables using recent panel data for the full nine-member BRICS group has not previously been conducted. This study fills that gap by applying a unified econometric framework to all nine BRICS nations over a 20-year period.

Research Objectives

- to identify and analyze the macroeconomic, infrastructural, and institutional determinants of FDI in the New BRICS countries
- to apply the Eclectic Paradigm (OLI model) as a theoretical framework for explaining FDI location decisions in the BRICS context
- to examine whether the expanded BRICS membership exhibits distinct or similar FDI drivers compared to the traditional five members
- to test nine research hypotheses linking specific variables to FDI inflows using panel econometric methods
- to provide evidence-based policy recommendations for improving FDI attractiveness in New BRICS economies

Significance of the Issue

The significance of this study lies in its contribution to understanding FDI dynamics within a rapidly evolving multilateral economic block. As BRICS has expanded to include economies with varying institutional development, infrastructure quality, and political environments, it is critical to empirically assess which factors drive foreign investment across all members. The findings offer practical insights for policymakers in New BRICS economies who seek to design investment-friendly environments, as well as for multinational corporations and international organizations evaluating the investment potential of these markets.

The study contributes to a limited but growing empirical literature on investment determinants beyond the original BRICS five, and extends analytical scope by incorporating

governance and infrastructure indicators alongside conventional macroeconomic variables. The 20-year panel dataset (2004–2023) further allows observation of how FDI determinants have evolved across both stable and turbulent periods.

Literature Review

The literature on FDI determinants in BRICS countries emphasizes market size, trade openness, and institutional quality as the primary drivers of foreign investment. The following five studies form the empirical foundation of this research.

Article	Author	Countries	Period	Methodology	Variables	Results
Determinants of FDI in BRICS economies: Analysis of economic, institutional and political factors (2012)	Pravin Jadhav	BRICS (5)	2000–2009	Panel data regression	FDI; Market size, Trade openness, Rule of law, Government transparency, Natural resources	Market size and trade openness are key FDI attractors. Rule of law matters; natural resources less significant.
FDI and Economic Growth in BRICS Economies: A Panel Data Analysis (2015)	Gaurav Agrawal	BRICS (5)	1989–2012	Cointegration and causality analysis	FDI; GDP, Trade openness, Human capital, Inflation, Government expenditure	Positive long-term FDI-GDP relationship. FDI boosts growth; growth in turn attracts more FDI.
Foreign direct investment into BRICS: an empirical analysis (2020)	Maryam and Mittal	BRICS (5)	1994–2018	Panel data regression	FDI; GDP, Trade openness, Exchange rate, Gross capital formation, Infrastructure	Large markets, stable exchange rates, and capital investment attract FDI. Infrastructure shows mixed effects.
FDI, Trade and Economic Growth: A	Prabhakar et al.	BRICS (5)	1993–2012	Panel data regression	GDP per capita; FDI, Exports, Imports,	FDI and trade positively impact growth.

New Paradigm of the BRICS (2015)					Domestic investment, Labour force	Reducing barriers immediately boosts economic advantages.
FDI, trade openness and economic growth in BRICS countries (2021)	Banday et al.	BRICS (5)	1990–2018	PMG regression and ARDL model	GDP; FDI, Trade openness, Gross capital formation, Exchange rate, Human capital	Trade openness and FDI significantly drive GDP growth. Recommend continued trade liberalization.

Preliminary Methodology

Theoretical Framework

The theoretical foundation of this study is John Dunning's Eclectic Paradigm (OLI model), which explains why and where firms choose to invest abroad. The framework integrates three sets of advantages: Ownership advantages (firm-specific assets and capabilities that can be leveraged internationally), Location advantages (host-country characteristics such as market size, infrastructure quality, and political stability), and Internalization advantages (the benefit of retaining activities within the firm rather than licensing or exporting). The independent variables selected for this study are principally grounded in the Location dimension of the OLI model, as they reflect country-level factors that make host economies more or less attractive to foreign investors.

Data Description

Annual macroeconomic data were obtained from the World Bank Database for the period 2004–2023. The panel covers all nine BRICS countries: Brazil, Russia, India, China, South Africa, Egypt, Ethiopia, Iran, and the United Arab Emirates. For the four new members, data were collected for the years preceding their official 2024 accession, providing a consistent 20-year observation window.

Variables Description

FDI (Dependent Variable) — Foreign Direct Investment, net inflows (% of GDP). Measures the relative scale of inward foreign investment in each country; expressed as a share of GDP to enable cross-country comparison.

AE — Access to Electricity — Access to electricity (% of population). A key infrastructure indicator reflecting readiness for business activity; higher electricity access supports industrialization and efficient production processes.

CC — Control of Corruption — Control of Corruption: Estimate. Reflects governance quality; lower corruption is associated with a more stable and predictable investment climate.

GDP — GDP (constant 2015 US$). Captures the economic size and potential of the host country; larger, growing economies tend to attract more FDI by offering broader market opportunities.

HTE — High-technology Exports — High-technology exports (% of manufactured exports). Reflects innovation capacity and technological development, which may attract knowledge-intensive FDI inflows.

LPI — Logistics Performance Index — Logistics Performance Index: Overall (1=low to 5=high). Evaluates the efficiency of trade and transport infrastructure; higher LPI reduces operational costs and may attract foreign investors.

OER — Official Exchange Rate — Official exchange rate (LCU per US$, period average). Captures currency stability and competitiveness; favorable exchange rates reduce investor risk.

PSAVT — Political Stability and Absence of Violence/Terrorism: Estimate — Political Stability and Absence of Violence/Terrorism: Estimate. A stable political environment is critical for reducing investment uncertainty and encouraging foreign capital.

RQ — Regulatory Quality — Regulatory Quality: Estimate. Reflects the government's ability to formulate pro-market regulations; effective regulatory environments are more attractive for FDI.

RDE — R&D Expenditure — Research and development expenditure (% of GDP). Signals innovation focus; higher R&D spending may attract FDI in high-tech and knowledge-intensive sectors.

TR — Trade Openness — Trade (% of GDP). Represents integration into the global economy; high trade ratios signal business-friendly, internationally connected environments.

Hypotheses of the Study

Based on the theoretical framework and the literature reviewed above, the following hypotheses are proposed:

H1: High-technology exports have a positive impact on FDI inflows in New BRICS countries.

H2: Research and development expenditure positively influences FDI inflows.

H3: GDP has a significant and positive impact on FDI inflows in New BRICS countries.

H4: Trade openness positively affects FDI inflows.

H5: Access to electricity positively influences FDI inflows by enhancing infrastructure quality.

H6: Political Stability and Absence of Violence is positively correlated with FDI inflows.

H7: Regulatory Quality is positively correlated with FDI inflows.

H8: Control of Corruption is positively correlated with FDI inflows by creating a transparent business environment.

H9: Official Exchange Rate is positively correlated with FDI inflows by reducing investment risks.

Data and Methodology

Data

This study uses annual macroeconomic panel data from the World Bank Database covering the period 2004–2023 for all nine BRICS economies. The dependent variable is FDI net inflows as a percentage of GDP. Independent variables include Access to Electricity, Control of Corruption, GDP, High-technology Exports, Logistics Performance Index, Official Exchange Rate, Political Stability, Regulatory Quality, R&D Expenditure, and Trade Openness. The panel structure — nine countries observed annually over 20 years — allows analysis of both cross-country variation and time dynamics in FDI inflows.

Methodology

The empirical analysis is conducted in Stata using panel data econometric techniques. The baseline model is specified as follows:

$$FDI = \beta 0 + \beta 1AE + \beta 2CC + \beta 3GDP + \beta 4HTE + \beta 5LPI + \beta 6OER + \beta 7PSAVT + \beta 8RQ + \beta 9RDE + \beta 10TR + \varepsilon$$

Where FDI is the dependent variable, β0 is the constant, β1–β10 are the coefficients of the independent variables, and ε is the error term. Prior to FGLS estimation, three diagnostic tests were conducted: the Variance Inflation Factor (VIF) test for multicollinearity, the Modified Wald test for heteroscedasticity, and the Wooldridge test for autocorrelation. The results of these tests guided the choice of FGLS as the final estimator.

Empirical Results

Descriptive Statistics

The descriptive statistics reveal considerable variation across the panel. Nearly every variable shows at least one negative minimum value — for example, FDI net inflows range from –1.76 to positive values, reflecting heterogeneous investment conditions across the nine economies. Political Stability records the lowest mean (–0.675), underscoring the governance challenges in several New BRICS members. The Official Exchange Rate exhibits the largest mean (2,667), driven by high nominal values in countries such as Iran. The Logistics Performance Index and R&D Expenditure display near-identical standard deviations (approximately 0.49 and 0.48 respectively), indicating comparable cross-country dispersion for these two variables.

Correlation Analysis

The pairwise correlation matrix indicates that FDI has negative bivariate correlations with Control of Corruption, Logistics Performance Index, Official Exchange Rate, and Trade Openness. However, none of these correlations are statistically significant with respect to the dependent variable, and correlations among the regressors remain at low to moderate levels, providing initial support for the absence of serious multicollinearity.

Diagnostic Tests

Test	Statistic	Outcome	Decision
Multicollinearity (VIF)	Mean VIF = 7.75	VIF below threshold of 10	No multicollinearity — all variables retained
Heteroscedasticity (Modified Wald)	Prob > chi2 = 100%	p > all significance levels	No heteroscedasticity — model estimates are efficient
Autocorrelation (Wooldridge)	Prob > F = 8.1%	Significant at 10% level of significance	Autocorrelation detected - FGLS applied to correct

FGLS Regression Results

The FGLS model is statistically significant overall (Prob > chi2 = 0%), confirming that the model is best fitted at the 1% level of significance. The results for individual variables are summarized below.

Variable	Direction	Significance	Interpretation
GDP	Positive	Significant	Larger, growing economies attract significantly more FDI inflows
Trade Openness (TR)	Positive	Significant	Open trade policies strongly correlate with higher FDI inflows
Access to Electricity (AE)	Positive	Significant	Better infrastructure quality directly attracts foreign investors
Political Stability (PSAVT)	Positive	Significant	A stable political environment reduces investor uncertainty
Regulatory Quality (RQ)	Positive	Significant	Investor-friendly regulations positively drive FDI attraction
HTE, LPI, OER, CC, RDE	—	Not Significant	These variables did not reach statistical significance in the FGLS model

Summary of Hypotheses

Hypothesis	Variable	Result
H1	High-technology Exports → FDI	Not Supported
H2	R&D Expenditure → FDI	Not Supported
H3	GDP → FDI	Supported
H4	Trade Openness → FDI	Supported

H5	Access to Electricity → FDI	Supported
H6	Political Stability → FDI	Supported
H7	Regulatory Quality → FDI	Supported
H8	Control of Corruption → FDI	Not Supported
H9	Official Exchange Rate → FDI	Not Supported

Conclusion

This research identified the key determinants of FDI in New BRICS countries using the Eclectic Paradigm (OLI model) and FGLS panel estimation over the period 2004–2023. The findings confirm that GDP, Trade Openness, Access to Electricity, Political Stability, and Regulatory Quality are statistically significant and positively associated with FDI inflows. These results are consistent with the Location dimension of the OLI framework, which predicts that host-country market size, openness, infrastructure, and institutional quality are primary drivers of foreign investment location decisions.

The variables that did not reach significance — High-technology Exports, Logistics Performance Index, Official Exchange Rate, Control of Corruption, and R&D Expenditure — may require more granular or country-specific analysis to reveal their effects, given the structural heterogeneity of the New BRICS group.

The policy implications are clear. New BRICS governments, particularly Egypt, Ethiopia, and Iran, should prioritize macroeconomic stability, political governance reform, expansion of electricity access, and trade liberalization to enhance their attractiveness to foreign investors. As the expanded BRICS association continues to develop, addressing institutional and infrastructural deficits will be critical for unlocking the full investment potential of new member economies. Traditional BRICS members should also recognize that sustaining GDP growth and maintaining open trade regimes are the most robust levers for continued FDI attraction.

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The Effect of Macroeconomic and Bank-Specific Variables on Bank Profitability in Kazakhstan

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ABSTRACT

The study explores the influence of macroeconomic and bank specific determinants on bank profitability in Kazakhstan over the period 2001-2024. The research using a panel data set of 21 second-tier banks of Kazakhstan empirically examines the major determinants affecting bank profitability. This study contributes to the existing literature on banking sector of emerging markets in general and on Kazakhstan in particular where sufficient empirical evidence is lacking.

The study employs advanced panel data econometric techniques to investigate the determinants of bank profitability. In order to robustly address potential multicollinearity, heteroskedasticity, autocorrelation, and cross-sectional dependence issues, methods such as Panel-Corrected Standard Errors (PCSE), Driscoll-Kraay and Feasible Generalized Least Squares (FGLS) are used. Research focuses on two different measures of bank profitability, Return on Assets (ROA) and Return on Equity (ROE).

Both macroeconomic and bank specific variables explaining bank performance receive significance in the analysis, though the relative importance differs between the two specified models. The inflation rate, interest rates, and bank liquidity all have significant positive effects on bank profitability in the ROA specification, interestingly, with inflation having the most pronounced effect in being negatively associated with bank performance. In the ROE specification, leverage is the most significant variable with a positive coefficient, reinforcing the importance of a bank's capital structure in generating returns to equity holders. Bank size also has a significant negative coefficient possibly capturing agency cost effects associated with large sized banks. Macroeconomic variables generally explain a lower and inconsistent proportion of the variation in ROE compared to bank internal characteristics.

Overall, the results emphasize the importance of internal bank characteristics, particularly capital structure and liquidity management, alongside selected macroeconomic conditions. These findings provide valuable insights for bank managers, policymakers, and investors in Kazakhstan, highlighting the need for effective financial management and a stable macroeconomic environment to enhance bank profitability.

Keywords: bank profitability, Kazakhstan, ROA, ROE, panel data analysis, macroeconomic variables, bank-specific variables.

1.INTRODUCTION

The banking sector in Kazakhstan is the most developed part of the national financial system and plays a key role as the main intermediary of savings into investment, in the absence of a well-developed capital market. The banking system of the country has undergone significant changes over the last two decades, including the process of financial liberalization, changes in legislation and integration into the global environment. At the same time, banks have faced various external shocks – the global financial crisis, sharp changes in world oil prices, the tenge devaluation, and, recently, the consequences of the outbreak of the new coronavirus infection (COVID-19). The influence of these factors, as well as of the institutional environment and the regulatory environment, on stability and activities of banks is studied in the monograph.

The research is focused on the emerging markets. In order to understand the current trends and developments in the banking sector of Kazakhstan, it is important to study the determinants of bank profitability. In the paper two approaches to measuring bank profitability are used: Return on Assets (ROA) that reflects a bank's operating efficiency and Return on Equity (ROE) that measures returns to shareholders. The determinants of bank profitability are divided into two groups: bank-specific factors (size, leverage, liquidity) that reflect decisions of bank managers and macroeconomic factors (GDP growth rate, inflation rate, interest rates, exchange rates) that reflect overall economic conditions.

Studies of bank profitability factors are widely presented in scientific literature. Classic explanations for bank profitability are well known, but empirical research results of their relative importance are ambiguous and significantly country-specific, especially for emerging markets. The influence of institutional environment, regulatory policies and vulnerability to external factors may be substantial, and therefore results for Kazakhstan obtained with the use of available data may not coincide with those for developed countries.

This research gap can be addressed by utilizing an unbalanced panel of 21 second-tier banks over the period 2001-2024. In order to address several key econometric issues, including heteroskedasticity, serial correlation, and cross-section dependence, a robust research strategy is adopted. A unique multi-objective framework is developed and estimated to study the determinants of bank profitability and measure its outcomes using internal and external determinants of bank performance. Alternative estimations and a series of robustness checks are then employed to assess the relative importance of the determinants of bank profitability and their distinct effects on different bank profitability measures.

This paper has both theoretical and practical implications. On the theoretical side, it contributes to the emerging market economy context. On the empirical side, it analyses interactions between bank behavior and the macro economy in a transition emerging economy of Kazakhstan. In terms of practical policy relevance, it provides useful information to bank managers, to policymakers and to investors, regarding the major factors that determine bank profitability, risk and stability.

2. LITERATURE REVIEW

2.1. Theoretical Framework

The paper uses three different theories to explain bank profitability.

The Efficiency Structure (ES) hypothesis (Demsetz, 1973) proposes that profitability is a function of bank efficiency, such that efficient banks are likely to possess lower costs and greater profitability than their less efficient rivals. We also consider bank-specific factors such as size, leverage and liquidity.

We then provide a detailed analysis of the factors that have driven bank profitability in emerging markets. Second, financial intermediation theory suggests that banks make profitability because they specialise in bringing together a large number of depositors to finance a large number of borrowers. The main component of bank profitability is the net interest margin, and interest rates play a significant role in determining this. However, banks must also manage liquidity, a process that involves a trade-off between maintaining sufficient liquidity and maximizing returns.

Third, we discuss the macroeconomic transmission mechanism affecting bank performance via external economic factors. We show that GDP growth is a key driver of bank performance by enhancing demand for credit and reducing default risk. In addition to actual GDP growth, we also explore the mixed effect of inflation rate on bank performance, differentiating between expected and realised inflation. We also find exchange rate volatility to be an important risk factor, especially in emerging markets like Kazakhstan.

2.2. Empirical Evidence

Empirical findings on bank profitability have been mixed and context specific, particularly for emerging markets.

The results for bank-specific variables such as bank size are mixed. On the one hand, larger banks are expected to achieve higher ROE due to economies of scale. On the other hand, inefficiencies in larger banks are found to depress ROE. Leverage is found to explain ROE and comes at a trade-off between higher returns and greater risk. Extremely high levels of leverage, however, also come with significant costs during times of financial distress. Liquidity improves the stability of the time-series models of ROE, but reduces returns as banks hold lower-yielding assets to augment their capital buffers.

Several macroeconomic variables also affect bank profitability. The GDP growth rate is positively related to bank profitability as it increases lending opportunities and improves asset quality. The inflation rate has ambiguous effects on bank profitability depending on how banks manage interest rates. Interest rates are positively related to bank profitability as interest income margins increase. Exchange rate volatility, however, has a negative effect on bank performance, especially in an open economy that is heavily dependent on natural resources.

This study provides an integrated analysis of internal and external factors affecting bank profitability using a comprehensive sample of European banks. Our results show that bank profitability is determined by a combination of internal and external factors and that the relative weight of these factors differs depending on the organizational form of banks and prevailing macroeconomic conditions

2.3. Hypothesis

To examine the determinants of bank profitability in Kazakhstan, two models are specified using Return on Assets (ROA) and Return on Equity (ROE) as dependent variables. Based on the theoretical framework and empirical evidence, the following hypotheses are formulated:

Model 1: Determinants of ROA

H1a: Bank size has a significant effect on ROA.
H1b: Leverage has a positive effect on ROA.
H1c: Liquidity has a positive effect on ROA.
H1d: GDP growth has a positive effect on ROA.
H1e: Inflation has a negative effect on ROA.
H1f: Interest rate has a positive effect on ROA.
H1g: Exchange rate has a negative effect on ROA.
H1h: Time-specific effects (2021 and 2022) have a significant impact on ROA.

Model 2: Determinants of ROE

H2a: Bank size has a significant effect on ROE.
H2b: Leverage has a positive effect on ROE.
H2c: Liquidity has a positive effect on ROE.
H2d: GDP growth has a positive effect on ROE.
H2e: Inflation has a negative effect on ROE.
H2f: Interest rate has a positive effect on ROE.
H2g: Exchange rate has a negative effect on ROE.
H2h: Time-specific effects (2021 and 2022) have a significant impact on ROE.

3. DATA AND METHODOLOGY

3.1. Methodology

This study explores the determinants of bank profitability in Kazakhstan using a rich set of bank-specific and macroeconomic variables in a quantitative framework. The study uses an unbalanced panel dataset of 21 second-tier banks over the period 2001–2024, as some banks entered the market later and others exited earlier, resulting in unequal time observations across banks. The data is reliable since it consists of financial and macroeconomic information gathered from audited bank reports and from the National Bank of the Republic of Kazakhstan, as well as from World Bank databases.

Two econometric models are used, first is explained by Return on Assets (ROA) and second is explained by Return on Equity (ROE). The analysis applies panel regression techniques with robust standard error corrections to ensure reliable statistical inference. By including year dummy variables for 2021 and 2022, the research explores the effect of the recent economic incident, particularly the COVID-19 shock period, on the banking sector. The estimates reveal abnormal effects stemming from the shocks on bank profitability, alongside relationships derived from macroeconomic variables.

This study employs an empirical procedure to address the research question. The analysis is carried out in the widely used statistical package Stata (StataCorp., 2017). Firstly, stationarity of variables, descriptive statistics and correlations between variables were conducted to identify anomalies and to have an understanding of the main characteristics of the variables, that should be considered before performing further diagnostic testing. Secondly, the research presents results from a baseline specification: Ordinary Least Square (OLS) regression with time fixed effects (year dummies) was performed.

Further, to make sure that model specification is adequate a series of diagnostic tests was conducted, such as multicollinearity, autocorrelation, heteroskedasticity and cross-sectional dependence.

Multicollinearity was assessed using the Variance Inflation Factor (VIF). Autocorrelation was tested using the Wooldridge test for panel data, while heteroskedasticity was examined through the modified Wald test for groupwise heteroskedasticity. Cross-sectional dependence was evaluated using the Pesaran test of cross-sectional independence.

After finalizing results of the diagnostic tests, appropriate estimation techniques were performed depending on the issues that were identified. Three methods were performed in this study, such as Driscoll–Kraay, Panel-Corrected Standard Errors (PCSE) and Feasible Generalized Least Squares (FGLS).In the first model with dependent variable ROA heteroskedasticity, autocorrelation, and cross-sectional dependence issues were identified, then to fix them Driscoll–Kraay estimator was applied.

In the second model with dependent variable ROE to address heteroskedasticity and cross-sectional dependence problems Panel-Corrected Standard Errors (PCSE) method was employed.

Overall, this research introduces a methodological approach, which consistently deals with numerous sources of unobservable information, enabling us to obtain robust and reliable results for a comprehensive assessment of the determinants of bank profitability in Kazakhstan.

3.2. Data sources

The database for this study was compiled from three main official sources to make sure that collected data is complete, reliable and consistent.

1. Audited financial statements of second-tier banks (KASE, 2025). Financial data for bank-specific variables were obtained from the official reports of banks listed on the Kazakhstan Stock Exchange (KASE). These reports served as the primary source for calculating key indicators, including Return on Assets (ROA), Return on Equity (ROE), bank size, leverage, and liquidity. The use of audited financial statements ensures a high level of accuracy and comparability across banks and time periods.
2. Official data from the National Bank of the Republic of Kazakhstan (NBRK, 2025). Information on monetary indicators, including interest rates and exchange rate dynamics, was collected from the official website of the National Bank. These data are considered reliable and reflect the macro-financial conditions of the economy.
3. World Bank database (World Bank, 2025). Macroeconomic variables, such as GDP growth and inflation rates, were obtained from the World Bank to ensure consistency with internationally recognized statistical standards and comparability over time.

3.3. Specification of variables

3.3.1 Dependent Variables

In order to assess bank performance in a complete way, two dependent variables have been chosen, representing two different aspects of profitability.

Return on Assets (ROA) is a financial metric used to evaluate a company's operational efficiency and illustrates how well total assets produce profit. This performance metric is widely

used to gauge a banking organization's management efficiency. ROA is one of the most common studies in banking analysis.

Return on Equity (ROE) measures the return earned by shareholders on their investment in the bank. ROE looks at how efficiently a bank is utilizing its equity base to generate returns. Additionally, ROE is affected by the bank's level of leverage.

The use of both ROA and ROE provides a more complete evaluation of bank profitability as these indicators measure different aspects of bank performance, reacting differently to internal and external determinants.

3.3.2 Independent and Control Variables

Independent variables in this study are divided into two: bank-specific variables and macroeconomic variables.

Bank-specific:

- Bank size is measured as the natural logarithm of total assets. The logarithmic transformation is applied to normalize the distribution and reduce the influence of extreme values (West, 2021). Larger banks may benefit from economies of scale but may also face inefficiencies associated with size.
- Leverage measures the level of total assets supported by a bank's total equity capital. Leverage is a measure of bank capitalization and associated risk; high levels of leverage can potentially increase returns as well as risk.
- Liquidity is measured as the ratio of short-term assets to short-term liabilities. This indicator captures the bank's ability to meet its short-term obligations and reflects financial stability (Roy, 2024).

Macroeconomic:

- GDP growth represents overall economic activity and is expected to influence the demand for banking services and credit expansion.
- Inflation reflects the general price level in the economy and may affect both costs and revenues of banks, as well as the real value of financial assets.
- Interest rate is defined as the weighted average interest rate. Interest rates are an important factor influencing interest income earned by banks and cost of funds. The weighted average interest rate is a weighted average of current interest rates on outstanding gross claims and of rates applicable to new business. It reflects both the average prevailing interest rate on advances and the average prevailing deposit rate.
- Exchange rate is measured as domestic currency units (KZT) per USD, capturing exchange rate volatility and external economic shocks.

Control variables:

- Time dummy variables for the years 2021 and 2022 are included in order to capture the impact of economic shocks such as the COVID-19 pandemic and other macroeconomic factors that affect the economy for those years.

Table 1. Summary of variables

Variable	Symbol	Formulas / Definitions
Dependent variables		
Return on Assets	*ROA*	(Net Income / Total Assets) * 100%
Return on Equity	*ROE*	(Net Income / Total Equity) * 100%
Independent variables		
Bank-specific variables		
Bank size	*Size*	Ln(Total Assets)
Leverage	*Lev*	Total Assets / Total Equity
Liquidity	*Liq*	Short-term Assets / Short-term Liabilities
Macroeconomic variables		
GDP growth rate	*GDPG*	GDP growth rate (annual %)
Inflation rate	*Infl*	Inflation, consumer prices (annual %)
Interest rate	*IR*	Weighted average interset rate (annual %)
Exchange rate	*ER*	Domestic currency units (KZT) per USD
Control variables (time dummies)		
Time dummy 2021	IYear2021	1 – if the observation is for the year 2021, 0 – otherwise
Time dummy 2022	IYear2022	1 – if the observation is for the year 2022, 0 – otherwise

3.4 Econometric models

The study explores the influence of macroeconomic factors and characteristics of banks on bank profitability in Kazakhstan. The results are based on two models. The first one explains the determinants of Return on Assets (ROA), and the second one explains the determinants of Return on Equity (ROE).

Model 1: Impact on Return on Assets

$$ROA = \beta_0 + \beta_1(Size) + \beta_2(Lev) + \beta_3(Liq) + \beta_4(GDPG) + \beta_5(Infl) + \beta_6(IR) + \beta_7(ER) + \beta_8 IYear_{2021} + \beta_9 IYear_{2022} + \varepsilon$$

Model 2: Impact on Return on Equity

$$ROE = \beta_0 + \beta_1(Size) + \beta_2(Lev) + \beta_3(Liq) + \beta_4(GDPG) + \beta_5(Infl) + \beta_6(IR) + \beta_7(ER) + \beta_8 IYear_{2021} + \beta_9 IYear_{2022} + \varepsilon$$

where:
ROA – Return On Assets (dependent variable)
ROE – Return On Equity (dependent variable)
β_0 – constant (intercept)
β_1–β_9 – coefficients for the corresponding explanatory variables
Size – Bank Size
Lev – Leverage
Liq – Liquidity
GDPG – GDP growth
Infl – Inflation
IR – Interest Rate
ER – first difference of Exchange Rate (ΔER)
IYear $_{2021}$ – time dummy equal to 1 if year = 2021, 0 otherwise
IYear $_{2022}$ – time dummy equal to 1 if year = 2022, 0 otherwise
ε – random error

4. ANALYSIS AND FINDINGS

4.1 Stationarity of variables

Testing for stationarity is an important step in any empirical investigation, as a pre-requisite to the application of most traditional time-series econometric techniques. In this paper, research tests for the presence of a unit root, or stationarity, for a number of variables, using a panel of 21 second-tier banks over the period 2001-2024.

Table2. Stationarity of variables

Variable	Test	Statistic	P-value	Conclusion
Dependent variables				
ROA	IPS	-4.1412	0.0000	Stationary
ROE	IPS	-4.2401	0.0000	Stationary
Independent variables				
Bank-specific variables				
Size	IPS	-2.2904	0.0110	Stationary
Lev	IPS	-4.3116	0.0000	Stationary
Liq	IPS	-6.1370	0.0000	Stationary
Macroeconomic variables				
GDPG	IPS	-6.4858	0.0000	Stationary
Infl	IPS	-7.9824	0.0000	Stationary
IR	IPS	-1.7642	0.0389	Stationary
ER	IPS	4.7001	1.0000	Non-stationary
d_ER	IPS	-14.2504	0.0000	Stationary

Im-Pesaran-Shin (IPS) panel unit root test for unbalanced panel with heterogeneous and individual time trends was applied to test the stationarity of the variables. The results in Table 2

indicate that all the dependent variables are I(0) at levels thus can be used as they are in the regressions.

Based on the unit root test - with the exception of exchange rate (ER) - all independent variables are not persistent and can thus be used as regressors.

However, the exchange rate (ER) is non-stationary since its IPS statistic is 4.7001 with p-value 1.0000. Time series data on exchange rates for emerging economies often exhibit trends and structural breaks (Wooldridge, 2013). Therefore, the level of the exchange rate can be replaced with the first difference of the exchange rate, ΔER. Once differenced, ER is found to be stationary since IPS statistic is -14.2504 with p-value of 0.0000. This is standard practice for non-stationary time series variables to avoid spurious regression.

All variables in the estimations are found to be stationary. As a result, the results from the pooled panel regression estimates can be treated as valid and reliable.

4.2 Descriptive Statistics

One of the main and first step of data analysis is descriptive statistics and it provides general overview of the variables like minimum value, maximum value and others. Table 3 presents the main statistical indicators for all variables

Table 3. Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Dependent variables					
ROA	410	2.137402	7.436064	-71.21	78.21
ROE	410	21.98737	194.1921	-549.55	3865.02
Independent variables					
Bank-specific variables					
Size	396	26.12828	2.022869	19.672	30.55141
Lev	396	8.882794	26.755	-6.336392	513.4574
Liq	387	1.341634	5.236792	0.0488894	100.2009
Macroeconomic variables					
GDPG	504	5.658333	3.631611	-2.5	13.5
Infl	504	8.595349	3.274	5.195684	17.1399
IR	504	9.645417	3.021129	5.5	16.6
ER	504	235.4967	125.5902	120.3	469.44
d_ER	483	14.03043	64.32453	-161.96	230.2

This section provides initial statistics on banks' performance indicators and macroeconomic variables. Bank average ROA stood at 2.14% with considerable dispersion brought about by economic shocks such as the global financial crisis, large oil exporting countries' volatility in oil prices and the COVID-19 pandemic, among others. ROE averaged 21.99% and the influence of leverage was significant. ROE showed extreme dispersion due to a number of outliers that were in financial distress or experienced abnormal returns.

The dispersion of the bank-specific variables shows that the dispersion of bank size is moderately large, with both small and large banks present. In contrast, the dispersion of leverage

and liquidity is substantially large with a number of extreme values, reflecting substantial differences in financial structure and risk between individual banks, especially during times of economic stress.

The economic environment in Kazakhstan has been unstable. The average annual growth rate of GDP in 2010-2012 reached 5.66%, with the annual inflation rate equal to 8.60%. Lending and deposit interest rates on average made up 9.65%. The exchange rate of national currency in 2010-2012 had recorded the major devaluations with high volatility of annual changes.

The data exhibit significant variation in bank performance and the macroeconomic environment over time, and thus call for an empirical analysis.

4.3 Correlation Analysis

Correlation analysis allows to identify primary relationships between variables and potential multicollinearity issues. Table 4 presents the correlation matrix for all variables in the study.

Table 4. Correlation Matrix

	ROA	ROE	Size	Lev	Liq	GDPG	Infl	IR	ER	d_ER
ROA	1.0000									
ROE	0.0375	1.0000								
Size	-0.0421	0.0467	1.0000							
Lev	0.0257	0.9334	0.1112	1.0000						
Liq	0.0199	-0.0177	-0.1827	-0.0352	1.0000					
GDPG	0.0446	0.0436	-0.2781	-0.0580	-0.0497	1.0000				
Infl	-0.0411	0.0071	0.1030	-0.0003	0.1155	-0.1212	1.0000			
IR	0.0477	-0.0235	0.2698	-0.0347	0.0094	-0.3783	0.6682	1.0000		
ER	0.0952	-0.0266	0.4002	-0.0324	-0.0471	-0.4711	0.3646	0.6935	1.0000	
d_ER	-0.0263	-0.0145	0.0739	-0.0105	-0.0059	-0.5931	0.1629	0.1906	0.3754	1.0000

The correlation matrix only very weakly shows relationships for the variable ROA (return on assets) with other variables. In contrast, ROE (return on equity) shows a strong positive relationship with leverage of 0.9334. This is also in line with the main message of this note, which states that leverage is the main driver of shareholders returns.

There is moderate correlation between interest rates and inflation, as well as between interest rates and exchange rates, given the role of monetary policy in setting interest rates. The correlations, however, do not pose serious multicollinearity problems for our analysis. There is also a negative correlation between GDP growth and exchange rates, meaning that currency depreciation tends to be associated with economic contraction.

A striking feature is the very low correlation between ROA and ROE, supporting the distinction between these two measures of profitability and implying the need for separate models.

4.4 Diagnostic Testing

Before performing regression analysis, it is necessary to check that the basic assumptions of the classical linear regression model are satisfied. This section presents the results of diagnostic tests for all two models.

Multicollinearity can lead to instability in regression coefficient estimates and overestimation of standard errors. The Variance Inflation Factor (VIF) was used for diagnostics. According to generally accepted criteria, VIF values above 5-10 indicate a serious multicollinearity problem (O'brien, 2007).

Table 5. Variance Inflationary Factor (VIF)

Model	**Model 1 (ROA)**		**Model 2 (ROE)**	
Variable	VIF	1/VIF	VIF	1/VIF
IR	2.33	0.430005	2.33	0.430005
Infl	2.32	0.431809	2.32	0.431809
GDPG	2.03	0.493576	2.03	0.493576
d_ER	1.65	0.605607	1.65	0.605607
IYear_2022	1.28	0.782660	1.28	0.782660
Size	1.25	0.798209	1.25	0.798209
Liq	1.09	0.920278	1.09	0.920278
_IYear_2021	1.03	0.969179	1.03	0.969179
Lev	1.03	0.974676	1.03	0.974676
Mean VIF	1.55	-	1.55	-

F test does not indicate serious multicollinearity problem in both models. The highest VIF value for each model is less than the critical value, it is 2.33 for Interest Rate in model 1. The average VIF values for the two models are 1.55 well below the threshold value of 5. This indicates that the independent variables are not highly correlated with each other and the estimates of regression coefficients are stable and reliable. The highest values of VIF in both models are Interest Rate (2.33) and Inflation (2.32) and these are due to natural macroeconomic relationships between these variables as revealed from correlation analysis; however, they are well within the acceptable limits.

Next is the test for heteroscedasticity. Heteroscedasticity, that is, the variability of random error variance, is a common problem in panel data. To diagnose it, the modified Wald test for group heteroscedasticity in fixed-effects models was used (Webel, 2011).

Table 6. Heteroscedasticity test results

Model	**Chi²**	**df**	**Prob > Chi²**	**Conclusion**
Model 1 (ROA)	1.2e+05	21	0.0000	Heteroskedasticity is present
Model 2 (ROE)	2.4e+05	21	0.0000	Heteroskedasticity is present

The results of the modified Wald test indicate that both models exhibit significant group heteroscedasticity with p-value of 0.0000 and yield very large chi-squared values. The larger value of the chi-squared for Model 2 is due in large part to the extreme volatility of ROE for the leverage outliers. Therefore, robust standard errors were used in estimating the models.

The next test is for autocorrelation. Autocorrelation of residuals is another common problem in panel data, especially when there is a temporal dependence of observations. To diagnose it the Woolridge test for first-order autocorrelation was used.

Table 7. Autocorrelation test results

Model	**F (1, 20)**	**Prob > F**	**Conclusion**
Model 1 (ROA)	20.119	0.0002	Autocorrelation is present
Model 2 (ROE)	0.091	0.7659	Autocorrelation is absent

Running the Wooldridge test on the two specifications yields different results. For Model 1 (ROA) the test yields an F statistic of 20.119 with a corresponding p-value of 0.0002, thus rejecting the null hypothesis of no serial correlation. In contrast, running the same test on Model 2 (ROE) yields an F of 0.091 with a p-value of 0.7659, thus failing to reject the null hypothesis. This result means that ROA is serially correlated (i.e. current ROA is affected by past ROA), whereas ROE is not serially correlated (i.e. ROE is largely a function of the current level of leverage). Therefore, only Model 1 requires correction for autocorrelation.

The last diagnostic test is the cross-sectional independence test. Cross-sectional dependence occurs when regression residuals correlate between different panel units. This can be caused by common shocks affecting all companies simultaneously. The Pesaran test for cross-sectional independence was used for diagnosis (Pesaran, 2004).

Table 8. Cross-Sectional Dependence test

Model	**Pesaran CD**	**Prob**	**Avg.abs. corr.**	**Conclusion**
Model 1 (ROA)	7.506	0.0000	0.297	Cross-sectional dependence is present
Model 2 (ROE)	4.749	0.0000	0.292	Cross-sectional dependence is present

Both models contain cross-sectionally dependent variables. The Pesaran test statistic for equal variable distributions is equal to 7.506 with p-value of 0.0000 for ROA (Model 1), and the average correlation is equal to 0.297. For ROE (Model 2), the corresponding CD statistic equals 4.749 with p-value of 0.0000, and the average correlation is 0.292. Therefore, both models may be driven by external macroeconomic shocks and should be estimated using methods appropriate for cross-dependent data (Bloom, 2009).

Table 9. Results of Diagnostic Testing

Test	Model 1 (ROA)	Model 2 (ROE)
Multicollinearity (VIF)	Not present	Not present
Heteroscedasticity	Present (p=0.0000)	Present (p=0.0000)
Autocorrelation	Present (p=0.0002)	Not present (p=0.7659)
Cross-Sectional Dependence	Present (p=0.0000)	Present (p=0.0000)

4.5 Selection of Estimation Method

To verify the robustness of the results and to correct for problems detected by the diagnostic tests (heteroscedasticity, autocorrelation and cross-sectional dependence), three common methods to correct for these problems when working with panel data were employed. The use of Panel-Corrected Standard Errors (PCSE), Driscoll-Kraay standard errors and Feasible Generalized Least Squares (FGLS) estimation allows for testing of hypotheses and for calculating confidence intervals that are robust to the problems detected. Furthermore, it makes it possible to test whether the results are driven by the specific estimation method applied.

Table 10. Comparison of regression methods for the ROA model

Variable	PCSE	Driscoll–Kraay	FGLS
	Coef., Pv	Coef., Pv	Coef., Pv
Bank-specific variables			
Size	-0.221; p = 0.345	0.286; p = 0.355	-0.221; p = 0.317
Leverage	0.010; p = 0.837	0.015; p = 0.076	0.010; p = 0.506
Liquidity	0.052; p = 0.413	0.082; p = 0.024	0.052; p = 0.499
Macroeconomic variables			
GDP Growth	0.275; p = 0.114	0.443; p = 0.078	0.275; p = 0.129
Inflation	-0.406; p = 0.007	-0.360; p = 0.013	-0.406; p = 0.018
Interest Rate	0.518; p = 0.001	0.394; p = 0.011	0.518; p = 0.005
Exchange Rate (d_ER)	0.003; p = 0.581	0.006; p = 0.260	0.003; p = 0.632
Time Effects			
Year 2021 Dummy	0.777; p = 0.588	-0.080; p = 0.826	0.777; p = 0.653
Year 2022 Dummy	0.564; p = 0.727	0.007; p = 0.990	0.564; p = 0.769
Constant	4.821; p = 0.430	-8.477; p = 0.338	4.821; p = 0.425

Model Statistics			
N	379	379	379
R-squared	0.0259	0.0286	-
Wald chi2 / F	13.20	134.96	10.06
Prob>chi2	0.1537	0.0000	0.3456

For Model 1 (ROA), the results demonstrate a high degree of consistency across all three estimation methods. The signs and relative magnitudes of the coefficients for the key variables are stable across specifications, and the statistically significant variables – Inflation and Interest Rate – retain their significance and expected directions in all three methods. Inflation shows a negative and significant coefficient, which are PCSE: -0.406 with p-value of 0.007; Driscoll-Kraay: -0.360 with p-value of 0.013; FGLS: -0.406 with p-value of 0.018, while Interest Rate shows a positive and significant coefficient, which are PCSE: 0.518 with p-value of 0.001; Driscoll-Kraay: 0.394 with p-value of 0.011; FGLS: 0.518 with p-value of 0.005. Liquidity reaches significance in the Driscoll-Kraay specification 0.082 with p-value of 0.024, while the remaining variables do not reach conventional significance levels across methods. The overall explanatory power is modest, with R-squared values of 0.026 and 0.029 for PCSE and Driscoll-Kraay respectively, reflecting the difficulty of explaining bank-level ROA variation with aggregate macroeconomic and structural variables alone.

Table 11. Comparison of regression methods for the ROE model

Variable	PCSE	Driscoll–Kraay	FGLS
	Coef., Pv	Coef., Pv	Coef., Pv
Bank-specific variables			
Size	-7.037; p = 0.000	0.058; p = 0.976	-7.037; p = 0.001
Leverage	6.978; p = 0.000	7.005; p = 0.000	6.978; p = 0.000
Liquidity	-0.006; p = 0.987	0.270; p = 0.051	-0.006; p = 0.993
Macroeconomic variables			
GDP Growth	-2.763; p = 0.076	-0.982; p = 0.437	-2.763; p = 0.103
Inflation	0.331; p = 0.821	0.567; p = 0.472	0.331; p = 0.836
Interest Rate	0.870; p = 0.581	-0.046; p = 0.977	0.870; p = 0.612
Exchange Rate (d_ER)	-0.079; p = 0.181	-0.045; p = 0.082	-0.079; p = 0.227
Time Effects			
Year 2021 Dummy	-17.676; p = 0.220	-26.646; p = 0.000	-17.676; p = 0.274
Year 2022 Dummy	-4.058; p = 0.801	-10.323; p = 0.077	-4.058; p = 0.821
Constant	148.034; p=0.001	-39.332; p = 0.437	148.034; p = 0.009
Model Statistics			
N	379	379	379
R-squared	0.8765	0.8847	–
Wald chi2 / F	738.30	95.32	2690.95
Prob>chi2	0.0000	0.0000	0.0000

For Model 2 (ROE), the results are also highly consistent across methods. The dominant finding across all specifications is the strong positive and significant effect of Leverage, such as

PCSE: 6.978 with p-value of 0.000; Driscoll–Kraay: 7.005 with p-value of 0.000; FGLS: 6.978 with p-value of 0.000 and the significant negative effect of Bank Size, such as PCSE: -7.037 with p-value of 0.000; FGLS: -7.037 with p-value of 0.001, with the exception of the Driscoll-Kraay specification where Size is not significant with p-value of 0.976). The macroeconomic variables do not reach statistical significance in any of the three methods for the ROE model, suggesting that equity returns in Kazakhstan's banking sector are primarily driven by internal capital structure decisions rather than macroeconomic conditions. The overall explanatory power is very high, with R-squared of 0.8765 (PCSE) and 0.8847 within (Driscoll-Kraay), confirming that the model captures the dominant sources of variation in ROE.

Table 12. Selection of the regression method based on diagnostic tests and the comparison of the methods

Model	Multicollinearity	Heteroskedasticity	Autocorrelation	CSD	Selected	Justification
Model 1 (ROA)	No	Yes	Yes	Yes	Driscoll–Kraay	Corrects heteroskedasticity, autocorrelation, and cross-sectional dependence simultaneously; appropriate for panels affected by time dependence and common shocks.
Model 2 (ROE)	No	Yes	No	Yes	PCSE	Corrects heteroskedasticity and cross-sectional dependence; efficient when autocorrelation is not detected.

The results obtained from the first model (Model 1) were initially addressed by employing the Driscoll-Kraay estimator. This procedure served as a benchmark from which to address the issues of cross-sectional dependence, as well as the problems of heteroscedasticity and serial correlation. The Driscoll-Kraay estimator corrects the standard errors for all three specifications and is particularly robust for long time-series panels, which in this study consists of time-series panels with a mean length of 24 years (Hoechle, 2007). The F-statistic for the overall significance of the estimated models are 134.96.

Model 2 is specified in cross-sectionally-dependent form and estimated using PCSE method. The results clearly indicate that, although the data is characterized by cross-sectional dependence, the main determinant of ROE – leverage – is a bank-specific variable with the coefficient being almost identical across all three methods. Leverage is an easy variable to interpret and PCSE provides efficient estimates that are heteroscedasticity robust (Faizulayev et al., 2021). The Wald chi-squared statistic of 738.30 for the model is highly significant.

4.6. Regression analysis results

4.6.1. Model 1: Impact of bank-specific and macroeconomic variables on ROA

However, after careful inspection of the distilled data, it was observed that the data was highly heteroscedastic, autocorrelated and highly cross-sectionally dependent. Therefore, to test Model 1, I used the Driscoll-Kraay standard errors method that corrects for all three problems simultaneously. These standard errors are conservative yet reliable especially when the time-series dimension of the panels is large. The results are presented in Table 13.

Table 13. Regression analysis results: Model 1 ROA

Variable	Coefficient	P-value
Bank-specific variables		
Size	0.286	0.355
Leverage	0.015	0.076
Liquidity	0.082	0.024
Macroeconomic variables		
GDP Growth	0.443	0.078
Inflation	-0.360	0.013
Interest Rate	0.394	0.011
Exchange Rate	0.006	0.260
Time Effects		
Year 2021 Dummy	-0.080	0.826
Year 2022 Dummy	0.007	0.990
Constant	-8.477	0.338
Model Statistics		
N	379	
R-squared	0.0286	
Wald chi2 / F	134.96	
Prob>chi2	0.0000	

Bank Specific Characteristics. In table 13 we can see that for the variable Size the coefficient is equal to 0.286 with t- and p-values equal to 0.76 and 0.355 in absolute value. Thus, this variable is statistically insignificant, i.e. bank size is not associated with ROA in Kazakhstan. Empirical research in emerging markets is ambiguous in explaining the ROA through bank size (Flamini et al., 2009; Goddard et al., 2004). In large banks there is a trade-off between scale efficiency and governance inefficiency. Therefore, we cannot confirm hypothesis H1a about positive effect of leverage on ROA. Leverage has a positive coefficient of 0.015 with p-value 0.076, i.e. this variable is statistically on the margin of significance. Thus, we see very weak positive effect of financial leverage on bank asset returns and the obtained result does not meet the significance level of 0.05, but it is consistent with hypothesis H1b about marginal increase in bank ROA with leverage growth. The results show that, in addition to the variables associated with the macro-environment and the market environment, the only bank-specific variable that is significant is Liquidity with a positive coefficient of 0.082 and p-value of 0.024, thus accepting hypothesis H1c. This means that the banks with higher levels of liquidity obtain higher returns on assets. High levels of liquidity reduce the risk of refinancing for banks, and their low-cost funding formula becomes more stable

and consistent, thereby increasing their ROA (Bourke, 1989; Trujillo-Ponce, 2013). A one-unit increase in the levels of the liquidity ratios implies an increase of 0.082 percentage points in ROA.

From the table 2 it follows that, as far as macroeconomic variables are concerned, GDP Growth Rate has positive coefficient of 0.443 which approaches marginal significance with p-value of 0.078 (hypothesis H1d). Thus, we may state that in periods of economy growth bank profitability is supported by increased demand for credit and improved quality of assets, Athanasoglou et al. (2008). On the other hand, Inflation has negative and statistically significant effect on ROA with coefficient of -0.360 and p-value of 0.013 (hypothesis H1e). It means that, for instance, one percent increase in annual inflation rate will decrease ROA for banks in Kazakhstan by 0.360%. In other words, banks in Kazakhstan are unable to anticipate their changes fully and pass them on to their borrowers, which results in reduced bank margins and asset returns (see, e.g., Tan and Floros, 2012; Davydenko, 2011). Interest Rate has positive and statistically significant effect on ROA with coefficient of 0.394 and p-value of 0.011 (hypothesis H1f). Higher interest rates increase the net interest margins (NIMs) and improve the asset yields of banks. In the literature Demirgüç-Kunt and Huizinga (1999) and Claeys and Vander Vennet (2008) address interest rate effects on bank profitability. For exchange Rate (ΔER) we only find a weak positive coefficient of 0.006 (p-value = 0.260), thus not supporting hypothesis H1g. This implies that banks manage their foreign currency exposure only partially. An alternative channel of how exchange rate affects credit quality could also be through a longer time horizon as addressed in Kohlscheen et al. (2018).

The time dummies for the years 2021 and 2022 are not significant. The 2021 equals to 0.080 (p-value 0.826) and 2022 equals to 0.007 (p-value 0.990), thus not confirming the hypothesis H1h that the COVID-19 pandemic and subsequent period introduced additional systematic shocks in ROA over and above the shocks accounted for by the macroeconomic variables (including inflation and interest rates) in the specified model.

Model 1 receives a moderate rating of 3 out of 10 with an R-squared of 0.0286, explaining about 2.9% of the variance in ROA. However, as mentioned above, there is significant bank-level heterogeneity in the sample used here, and no bank fixed effects are included in this specification. On the other hand, the high F-statistic of 134.96 with Prob > chi2 = 0.0000 indicates that the model is significantly from zero. As before, all standard errors have been corrected for three key econometric problems. There are 379 observations in the sample used to generate the results for this model.

4.6.2. Model 2: Impact of bank-specific and macroeconomic variables on ROE

Based on the diagnostic test results, we choose the PCSE method as the baseline for Model 2. PCSE is able to address the two main issues of heteroscedasticity and cross-sectional dependence and provides robust and consistent estimates that are easy to interpret. The results are presented in Table 14.

Table 14. Regression analysis results: Model 2 ROE

Variable	Coefficient	P-value
Bank-specific variables		
Size	-7.037	0.000
Leverage	6.978	0.000
Liquidity	-0.006; p = 0.987	
Macroeconomic variables		
GDP Growth	-2.763	0.076
Inflation	0.331	0.821

Interest Rate	0.870	0.581
Exchange Rate	-0.079	0.181
Time Effects		
Year 2021 Dummy	-17.676	0.220
Year 2022 Dummy	-4.058	0.801
Constant	148.034	0.001
Model Statistics		
N	379	
R-squared	0.8765	
Wald chi2 / F	738.30	
Prob>chi2	0.0000	

The results based on the bank-specific data differ from the results in Model 1. The results in this model confirm the hypothesis H2a about the negative effect of size on ROE. The coefficient of the Size variable is -7.037 with p-value of 0.000. It means that a one-unit increase in the logarithm of total assets (in billions of KZT) of a bank decreases its ROE by 7.037%. Therefore, larger banks in Kazakhstan have worse ROE. It is possible that larger banks have some benefits of economies of scale, but they are offset by inefficiencies caused by bank's size (agency costs, bureaucratic inefficiencies, poor corporate governance etc.). These findings are similar to the results for emerging markets countries found by Flamini et al. (2019). 2009) and the inefficiencies of larger banks in less developed financial markets. In Model 2, the most significant explanatory variable of ROE is leverage. Supporting hypothesis H2b, the coefficient of leverage (total assets/total equity) is 6.978% with p-value of 0.000. This means that a one unit increase in the leverage ratio leads to a 6.978% increase in ROE. Therefore, as assets generate positive returns, the level of profitability per unit of equity increases. The above finding supports the capital structure theory and is consistent with Demirgüç-Kunt and Huizinga (1999), Tan and Floros (2012). The coefficient on Liquidity is very close to zero at -0.006 with a p-value of 0.987 and therefore we cannot support alternative hypothesis H2c. Although Liquidity has a significant positive impact on ROA, the results reveal that the liquidity–profitability relationship does not work through stock returns but it does so through efficiency. That is, effective use of assets is an important determinant of ROA while leverage does not explain ROA.

For the macroeconomic variables in the PCSE specification, none are significant. The coefficient on GDP Growth of -2.763 with p-value of 0.076 is opposite in sign to hypothesis H2d and suggests that strong economic growth in Kazakhstan could be pressuring banks to increase credit activity and higher required equity levels thereby reducing returns to shareholders. Inflation was found to be positively related to banking system ROsCE at 0.331 with p-value of 0.821 thus not supporting hypothesis H2e. Interest Rate was positively but insignificantly related to PCSE at 0.870 with p-value of 0.581 thus not supporting hypothesis H2f. Coefficient for Exchange Rate (ΔER) is small in absolute value and statistically insignificant (0.079; p = 0.181). It has expected sign. It is worth to note that all considered macroeconomic variables explain the level of ROE very poorly. However, it turns out that capitalization policy (i.e. a set of internal decisions) explains the level of ROE in banking sector of Kazakhstan rather well, and the return on equity is largely determined by the level of financial leverage.

The time dummy variables for 2021 and 2022 are statistically insignificant in the PCSE specification. Thus, we have no evidence to support hypothesis H2h. The coefficient of 2021 is -

17.676 with p-value of 0.220, and that of 2022 is -4.058 with p-value of 0.801. The coefficient of the constant term is 148.034 with p-value of 0.001. Although the coefficient of 2021 is negative and large in magnitude, its p-value is larger than 0.1, indicating that there exists substantial cross-bank variation in how the post-pandemic period affected equity returns given the heterogeneous financial positions of the banks in the sample in that period.

We rate the quality of Model 2 as very high. First, the R-squared of 0.8765 indicates that the model explains an extremely high 87.7% of the variation in ROE. As with the first model, the main determinant of ROE in this model is also leverage. The R-squared could be increased by including additional variables but for the purpose of this analysis it is considered to be sufficient. The Wald chi-squared statistic of 738.30 with Prob > chi2 = 0.0000 is very high and, therefore, the model is very significant. The sample of N = 379 observations provides a robust basis for inference. It should be noted, however, that the high R-squared is substantially driven by the structural relationship between leverage and ROE, as the definition of ROE embeds equity – which leverage directly affects – in the denominator. This should be taken into account when assessing the model's explanatory contribution.

Taken together, the results of Models 1 and 2 reveal a clear and important distinction between the determinants of ROA and ROE in Kazakhstan's banking sector. ROA is primarily shaped by macroeconomic conditions – specifically inflation and interest rates – alongside liquidity management at the bank level. ROE, in contrast, is overwhelmingly determined by leverage, with bank size playing a secondary but significant negative role. Macroeconomic variables are largely irrelevant for explaining equity returns once capital structure is controlled for. These findings confirm that ROA and ROE capture fundamentally different dimensions of bank profitability and respond to different sets of drivers, underscoring the importance of using both measures in a comprehensive empirical analysis.

DISCUSSION AND CONCLUSION

5.1 Practical Recommendations Based on the Findings

The findings of this study have important implications for bank managers, regulators and policymakers of Kazakhstan.

The results for bank managers suggest that for maintaining ROA, they need to keep adequate liquidity buffers to satisfy regulatory requirements as well as to serve the needs of corporate clients. Views of interest rates are also important: in particular, those banks that can better reprice their loan portfolios in response to increases in the base rate will gain the most from tighter monetary policy. Moreover, inflation is found to have a significant negative impact on ROA, and thus banks need to improve the effectiveness of their interest rates' pass-through to interest rates. Views of bank managers of ROE reveal that leverage is the dominant positive factor explaining ROE, and thus the key to achieving higher ROE is to optimize the bank's equity-to-assets ratio. However, given the experience of sharp contractions in the economy in recent years, any gains in ROE must be pursued with an eye to avoiding financial distress.

For policymakers and regulators, the main factor that impacts the banking sector profitability is the strong macroeconomic environment which supports ROA. Efforts of National Bank of Kazakhstan to bring down the inflation are also positive for banking sector profitability. For bank supervisors, monitoring leverage is important. Leverage can enhance ROE in normal times but

increase system wide risk in bad times. Hence, supervisor should design the capital adequacy requirements so as to not allow banks to carry extremely high levels of leverage. Large systemically important banks in particular require supervisors' extra attention. Moreover, supervisor should require large banks to earn ROE based on their operational efficiency instead of their size.

Determinants of bank profitability in Ukraine measured by ROA and ROE differ significantly. High ROE is largely driven by high leverage and not by high operating efficiency. Therefore, it is important to monitor not only ROE but also capital adequacy and asset quality of banks. Inflation and interest rates are the best macroeconomic indicators of future changes in ROA, while debt-to-equity ratio is the best internal indicator of change in ROE.

5.2. Study Limitations and Directions for Future Research

Although this study contributes to our knowledge and understanding of the issues and challenges currently faced, there are a number of limitations that need to be highlighted and addressed in any future research.

Although the constructed data set spans 24 years from 2001 to 2024, it is unbalanced in nature. In the sample, not all of the 21 banks covered in the study have time-series observations for the entire 24-year period. Some banks entered the market at different times, while others merged or went bust during the time span of the study. The current sample can thus be considered selected and is potentially subject to survivorship bias. Future research could employ more sophisticated imputation methods to address this limitation, or focus on a more homogeneous sample of banks with complete time-series observations.

In addition to including country-specific and year-specific factors in the model, we also limit the set of bank-specific variables included in the regression to bank size, leverage, and liquidity. Other important internal determinants of bank profitability such as non-performing loan ratio, cost-to-income ratio, capital adequacy ratio, and loan-to-deposit ratio are not included in this baseline model due to a lack of data. However, these variables are used as additional independent variables in alternative versions of the ROA model.

The estimated models for each year explain well the cross section of ROA observed during that year. However, overall, the ROA model is explained very poorly: the R-squared for the equation for the entire sample is 0.029. Clearly there are many factors which determine ROA that are not captured in this paper. These might include unobserved management quality at individual banks, ownership structure, credit risk culture and competitive position. In future research we might consider adding a bank fixed effect to the models. We could also consider incorporating a number of other indicators of good banking governance practice.

This paper does not consider any potential nonlinear relationships or interaction effects between the variables studied. For instance, we cannot preclude the possibility that the relationship between leverage and ROE differs during times of heightened macroeconomic volatility relative to more tranquil periods. Similarly, we cannot rule out the possibility that the effect of inflation on ROA differs during periods of high interest rates relative to periods of low interest rates. However, incorporating such relationships in a future study would require the use of dynamic panel models, threshold regression models or regime-switching models.

The fifth limitation is that this study is country-specific, hence results are not generalizable to other emerging markets. A comparative study including other emerging economies of the region or the banking sector of the entire Central Asian region or CIS countries can enhance the contribution of this research.

5.3. Conclusion

This paper analyses the factors explaining bank profitability in Kazakhstan during 2001-2024. A unique bank-level data for 21 second-tier banks is used. Robust econometric methods, including Driscoll-Kraay standard errors for the ROA model and Panel-Corrected Standard Errors for the ROE model are employed in order to address the problems of heteroscedasticity, autocorrelation and cross-sectional dependence.

The determinants of both measures of profitability, ROE and ROA, differ significantly. Return on Assets is primarily influenced by macroeconomic factors. In particular, lower inflation has a significant negative effect and lower interest rates a significant positive effect on ROA via the net interest margin. Bank-specific factors that explain ROA include liquidity, where more liquid banks have higher ROA due to lower refinancing risk. However, the ROA model has only limited explanatory power due to substantial bank-level variation within the sample.

Our analysis of the factors explaining Return on Equity reveals that mainly internal capital structure factors drive this measure. The leverage is the single most important factor with strong and significant positive impact. Therefore, financial amplification is the main driver of shareholders' return in the banking sector of Kazakhstan. We found a significant negative impact of bank size on ROE which may be related to inefficiencies associated with bank size. Macroeconomic factors explain almost nothing for equity profitability of banking assets in Kazakhstan.

The paper for the first time in the global empirical research on bank profitability is devoted to study of the determinants of bank profitability in an emerging market economy of the resource-based type with dominant state-owned banking sector – the Republic of Kazakhstan. The study finds that determinants of ROA and ROE are fundamentally different and, thus, it is reasonable to use two indicators for simultaneous analysis and not to consider them as substitutes for each other. A unique feature of the study is the length of time series used – 24 years (from 1995 to 2018), which passed through several economic crises and other essential events affecting performance of banks and their environment.

The results put a significant constraint on earnings in the banking sector of Kazakhstan and require efficient management of liquidity resources and active interest policy at the level of individual banks as well as for macroeconomic stability at the level of state policy, i.e. low inflation rate. Future research will benefit from incorporating additional bank specific variables into the analysis, employing a dynamic panel data approach, and an expansion of the sample of banks to include cross country comparisons within the broader Central Asian region.

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The impact of corporate governance on the performance of companies in Kazakhstan

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ABSTRACT

Recent academic research demonstrates that effective corporate governance is one of the most important factors in improving organizational performance, particularly in countries with economies in transition. This research has established that corporate governance mechanisms, such as the structure of the board of directors, the independence of its members, and the overall level of disclosure, have a key influence on the financial performance and market value of specific companies. At the same time, the academic literature indicates that in developing economies, including the Republic of Kazakhstan, these relationships remain understudied and yield mixed results depending on the institutional environment and ownership structure.

This research aims to analyze the impact of corporate governance on the performance of commercial organizations in the Republic of Kazakhstan. The analysis utilized panel data on Kazakhstani companies compiled from open sources, including financial statements, corporate reports and stock market data for a specific period. Econometric analysis was also employed in this research, enabling an assessment of the impact of corporate governance quality, the proportion of independent directors, and the overall level of disclosure on companies' financial performance and market valuation.

KEYWORDS: corporate governance, company performance, board of directors, independent directors, disclosure, market value, Kazakhstan.

1. INTRODUCTION

1.1 Economic background

Corporate governance is a key element of modern organizational management theory and practice, as it defines the fundamental mechanisms for reconciling the interests of various participants in economic relations, including shareholders, managers, creditors and other stakeholders (Shleifer & Vishny, 1997). In the current context of financial market globalization, growing international competition and increasing investor demands for transparency, corporate governance standards are becoming critically important for the stable operation of companies.

For emerging market countries, such as the Republic of Kazakhstan, corporate governance issues are of key importance due to the transition from a centralized planned economy to a market model. During the economic reforms that began in the 1990s, most of the corporate sector was privatized, while ownership remained highly concentrated and state institutions continued to exert considerable influence over the activities of large organizations (Claessens & Yurtoglu, 2013). These characteristics of Kazakhstan create a specific environment in which corporate governance mechanisms operate differently from those in economically developed countries.

1.2 Introducing Corporate Governance

During the study of scientific sources, it was established that the concept of corporate governance is viewed as a set of mechanisms, institutions, and procedures that ensure such aspects as: observance of shareholders' rights, control over management activities, and rational allocation of resources of a particular organization (Shleifer & Vishny, 1997). The agency theory proposed by Jensen and Meckling (1976), serves as one of the fundamental theoretical foundations of corporate governance. According to this concept, the separation of ownership and control creates agency conflicts, as managers who run an organization may act in their own interests, which may conflict with the interests of business owners.

Various corporate governance mechanisms are proposed to reduce agency costs, including: developing an optimal board structure, appointing independent directors, creating specialized committees, and ensuring a high level of disclosure (Hermalin & Weisbach, 2003). In this context, international standards emphasize that such mechanisms contribute to greater transparency, increased investor confidence, and more effective risk management (OECD, 2015).

It is noteworthy to mention that empirical studies in developed economies demonstrate a positive relationship between the quality of corporate governance and the immediate performance of such companies, including financial indicators and market value (Brown & Caylor, 2006; Bhagat & Bolton, 2008).

1.3 Objectives of the Study

The main objective of this study is to analyze the impact of key corporate governance mechanisms on the performance indicators of companies operating in the domestic market. In particular, the study focused on characteristics such as the structure and independence of the board of directors, concentration of ownership, and the level of transparency of corporate reporting. Achieving this research goal will provide a clearer understanding of which elements of corporate governance have the greatest impact on the financial and market performance of organizations.

Objectives:

1. To study the theoretical foundations of corporate management and its measurement in international practice.
2. To systematize empirical scientific research on the impact of corporate governance on efficiency.
3. To create an econometric model based on panel data from domestic companies.
4. To assess the significance of individual corporate governance mechanisms.
5. To develop practical recommendations for corporate governance and regulatory policy in the Republic of Kazakhstan.

1.4 Purposes of the Study and its Benefits

Based on an analysis of scientific literature, it was found that, despite a significant number of studies devoted to corporate governance and its impact on company performance, only a small

number of studies examine this relationship in the context of emerging economies. It is important to note that most existing studies focus on developed markets, where the institutional environment, investor protection mechanisms and corporate governance practices are much better established. Based on these factors, there is a need for a more detailed study of how corporate governance characteristics affect the performance of companies in the Republic of Kazakhstan, where the corporate control system and corporate governance institutions are still developing.

1.5 Research Questions

The main questions addressed by this scientific study are: Is there a statistically significant relationship between corporate management mechanisms and company performance indicators in the Republic of Kazakhstan? Which elements of corporate governance have the greatest impact? Do the identified dependencies remain after controlling for confounding variables? What is the specific nature of the influence of corporate governance in the institutionally unique environment of the Republic of Kazakhstan? The purpose of this study is to answer these questions.

2. LITERATURE REVIEW

2.1 Theoretical foundations of corporate governance

One of the key theoretical foundations for the study of corporate governance in the modern world is the aforementioned agency theory, which was formulated in Jensen and Meckling's classic work 'Theory of the Firm: Managerial Behaviour, Agency Costs and Ownership Structure' (Jensen & Meckling, 1976). This theory explains the nature of the relationship between company owners and managers, as well as the economic consequences of the separation of ownership and control functions in business.

According to agency theory, an organization is represented as a complex of contractual relationships between various economic entities. Within this model, shareholders act as principals, and managers act as agents to whom the right to manage the company is delegated. Since managers make decisions on behalf of capital owners, there is a potential risk that their personal interests may not coincide with those of shareholders (Jensen & Meckling, 1976).

The main problem in agency theory is agency conflict, which can arise due to asymmetry in the flow of information, as well as differences in motivation between the principal and the agent. It should be emphasized that managers have more complete information about the activities of a particular organization and can use this information to make decisions that will maximize their own profits rather than the value of the company.

This results in agency costs, which include:

1. the costs of monitoring managers' activities by shareholders.
2. costs of creating incentive and control mechanisms.
3. losses in efficiency resulting from ineffective management decisions.

In their 1976 paper, Jensen and Meckling argue that effective corporate governance mechanisms can significantly reduce agency costs (Jensen & Meckling, 1976). Such mechanisms include: an independent board of directors, internal control systems, ownership structure, and transparency of information disclosure. This theoretical model assumes that improving corporate

governance directly contributes to better alignment of the interests of managers and shareholders, which, in turn, should lead to increased efficiency of a particular organization.

It should be noted that the provisions of agency theory have gained widespread recognition in corporate governance research and have become one of the most widely used theoretical foundations in corporate finance and organizational economics. As an example, the main task of corporate governance is to provide mechanisms that allow investors to guarantee a return on invested capital (Shleifer & Vishny, 1997).

Empirical analysis of the scientific literature also confirmed the importance of agency theory for analyzing the effectiveness of companies. In particular, the characteristics of the board of directors and the immediate ownership structure can have a key impact on the financial performance of a particular organization (Bhagat & Bolton, 2008). Similar conclusions were also reached in the analysis of scientific literature, which found that organizations with higher levels of corporate governance demonstrate higher market value and higher business process efficiency indicators (Brown & Caylor, 2006).

Agency theory is also supported by the fact that in emerging market countries, improvements in corporate governance are directly linked to higher operational efficiency of companies and higher market valuation (Klapper & Love, 2004).

The agency theory was further developed in the work 'Separation of Ownership and Control' (Fama & Jensen, 1983). In this scientific work, the authors expanded the original concept of relationships and proposed a more detailed model of corporate governance structure. This scientific publication also considers companies as decision-making systems within which different participants perform different functions. In this context, the authors identify two key stages in the decision-making process (Fama & Jensen, 1983):

1. Initiation and implementation of decisions.
2. Control and approval of decisions.

One of the most important conclusions identified in the analysis of scientific literature is the assertion that effective corporate governance requires the management of organizations to separate management and control functions. In this case, the board of directors should act as an independent monitoring and control body that supervises managers and protects the interests of shareholders.

Within this concept, the presence of independent directors who are not involved in the day-to-day management of the company and are therefore able to objectively evaluate the actions of management is of particular importance. The presence of independent board members is seen as an important tool for reducing agency conflicts and improving the effectiveness of corporate governance (Fama & Jensen, 1983).

At the same time, one study showed that the level of investor protection varies significantly between countries and also has a significant impact on the development of financial markets and the corporate sector (La Porta et al., 1998). The authors of this scientific work concluded that countries with stronger legal protection for investors are characterized by a more developed stock market and a higher level of company capitalization.

It should be emphasized that an important milestone in the development of international corporate governance standards was the formation of the Organization for Economic Co-operation and Development's Principles of Corporate Governance. These principles were first published in 1999. They have been updated several times since then. The latest significant revision was presented as part of the G20/OECD Principles of Corporate Governance (OECD, 2015).

The OECD Principles have become one of the most widely recognized international standards in the field of corporate governance and are actively used by governments, international organizations and corporate structures in the creation of national corporate governance codes. The

main objective of these principles is to increase the level of transparency, accountability and effectiveness of corporate governance.

According to the OECD (2015), an effective corporate governance system should ensure the following elements:

1. protection of shareholders' rights and equal treatment of shareholders;
2. recognition of the rights of other stakeholders;
3. timely and reliable disclosure of information about the company's activities;
4. effective functioning of the board of directors.

In the Republic of Kazakhstan, the OECD principles are also used as a basis for the formation of national corporate governance standards, particularly in state-owned and quasi-state-owned companies. Their integration is aimed at increasing the transparency of management, improving the monitoring and control system, and increasing the overall investment attractiveness of Kazakh companies.

2.2 Corporate governance and company performance

It is crucial to highlight that empirical studies of corporate governance in developed countries, which were discovered during scientific work, have formed a significant theoretical and statistical basis that confirms the link between corporate governance mechanisms and company performance. One of the most relevant mechanisms is the structure of the board of directors.

As an example, we can cite the 2010 study by Duchin, Matsusaka, and Ozbas, which demonstrated that the influence of independent directors on company performance depends on the availability of information within the firm (Duchin, et.al., 2010). Using data from American companies, the authors found that a direct increase in the proportion of independent directors leads to an increase in the efficiency of a particular organization when the asymmetry in the information flow is relatively small. However, when uncertainty is high, the influence of independent directors may be much less pronounced.

During the analysis of the literature, it was found that, unlike in developed economies, scientific research on corporate governance in emerging market countries has appeared relatively recently and often shows more ambiguous results. This information is related to the fact that the institutional environment in countries such as the Republic of Kazakhstan can differ significantly from the conditions in developed economies.

Some studies also emphasize the importance of corporate governance for small and medium-sized enterprises in developing countries. In particular, it has been found that the introduction of formalized corporate governance mechanisms, including audit, disclosure and board oversight systems, can significantly improve the operational efficiency of companies and increase their competitiveness in international markets.

Despite a significant amount of empirical research, the analysis of the impact of corporate governance faces a key methodological problem, which is expressed in endogeneity.

It is necessary to point out that endogeneity arises in specific cases when there is a two-way causal relationship between variables, as well as when the variables under analysis are influenced by a hidden factor that was not initially included in the model. In the context of this study, this means that not only can corporate governance influence a company's performance, but successful organizations can also integrate more sophisticated corporate governance mechanisms.

2.3 Corporate governance in countries with economies in transition

Corporate governance in countries with economies in transition, referred to in many academic sources as emerging markets, is shaped by an institutional environment that differs from that of developed economies. These differences are directly related to the peculiarities of the legal systems of these particular countries, the current level of development of financial markets, the established ownership structure of organizations, and the degree of state regulation of the economy. It should be noted that scientific literature indicates that institutional characteristics largely determine the nature and effectiveness of corporate governance mechanisms.

A key feature of countries with transitional economies is the relatively weak development of legal institutions and mechanisms for protecting investor rights (Young, et.al., 2008). This feature means that traditional corporate governance mechanisms used in countries with developed economies may function less effectively. Given this fact, alternative forms of control, including such instruments as concentration of ownership, participation of major shareholders, and informal institutional mechanisms, begin to play an important role.

These features are of key importance for the presented scientific research, as the Republic of Kazakhstan belongs to the category of countries with emerging markets, which means that the impact of corporate governance mechanisms on the effectiveness of the analyzed organizations may differ from the results obtained in developed economies.

At the same time, one of the most distinctive features of corporate governance in similar countries is the high concentration of ownership. In this context, it should be noted that, unlike developed countries, where the ownership structure is in most cases more distributed, in emerging economies a large share of the shares of organizations may belong to a limited number of major shareholders.

A study based on an analysis of more than 1,300 companies from eight East Asian countries demonstrated that the overall level of ownership concentration has a significant impact on company performance and market value (Claessens, et. al., 2002). The authors of this study found that moderate ownership concentration can contribute to increased corporate governance efficiency; however, in this relationship, excessive concentration can also lead to a decrease in the market valuation of companies due to risks for minority investors.

Another important characteristic for corporate governance is significant state participation in the corporate sector, which applies to countries such as Kazakhstan. In this context, the state can act as a shareholder in companies directly or through state holding companies and funds, which in turn creates a specific model of corporate governance.

First and foremost, state participation can provide specific organizations with access to financial resources, infrastructure and political support. This feature of state influence can have a positive impact on the stability and long-term development of organizations. At the same time, state participation can lead to a decrease in the performance of companies due to political interference in management and weak incentives to improve efficiency.

A study by Megginson and Netter demonstrated that the privatization of state-owned organizations in many countries led to an improvement in their financial performance (Megginson & Netter, 2001). The authors of this scientific work analyzed more than 200 organizations from 41 countries and concluded that after the privatization of state-owned companies, these entities began to demonstrate higher efficiency compared to the period of state management.

However, more recent scientific studies show that the impact of state participation can be ambiguous. For example, state participation can increase the overall level of transparency of companies and improve their access to financing, but at the same time it can reduce the

effectiveness of corporate governance due to political goals that differ from the goals of profit maximization (Borisova, Brockman, et.al., 2012).

2.4 Research gap

Despite the significant number of scientific studies identified during the literature review, there remain a number of significant research gaps in contemporary scientific literature. These gaps can be explained by the current characteristics of the approaches used in the analysis, as well as the limited empirical base, particularly in countries with transitional economies. Within the framework of this scientific study, three key aspects of the research gap can be identified: the lack of panel studies in the Republic of Kazakhstan; insufficient specification of the mechanisms of corporate governance's impact on labour productivity; and the ambiguity of the results obtained.

The first important aspect of the research problem is the lack of panel studies devoted to the domestic context. It should be emphasized that most empirical studies analyzing the impact of corporate governance are based on data from developed countries and exploit the statistical databases of large international panel studies (Akhmetova & Yessengeldin, 2017).

At the same time, studies devoted to the post-Soviet countries are fragmentary in nature and, in most cases, are based on limited samples or one-off surveys of enterprises. Scientific publications on the Republic of Kazakhstan tend to use cross-sectional data more often, which, in turn, makes it difficult to analyze the dynamics of indicators over time and limits the ability to identify cause-and-effect relationships. It is important to note that this lack of long-term panel observations directly leads to the analyzed impact on the economic performance of organizations being assessed indirectly, which also does not allow for reliable conclusions to be drawn about the long-term effects of investments in corporate governance (Nazarbayev University GSB, 2021).

The second aspect of the research gap in this area is the lack of specificity in the mechanisms by which corporate governance influences the performance of companies. Most of the scientific works studied assert that effective corporate governance mechanisms directly contribute to improving the performance of the organizations under consideration; nevertheless, these mechanisms are described in rather general terms (Tulegenova & Mussina, 2021).

The third significant aspect of the research gap under consideration is the ambiguity of the results presented in the scientific literature. Although a significant part of the research confirms the positive impact of developed corporate governance mechanisms on the efficiency of companies, there are also works in the scientific literature that demonstrate less ambiguous or even contradictory results. A number of empirical studies note that individual elements of corporate governance can have different effects on performance indicators depending on the institutional environment, ownership structure, or stage of development of the national economy. For example, a high concentration of ownership can simultaneously strengthen control over management and reduce the overall level of protection for minority shareholders. Similarly, an increase in the size of the board of directors is considered in some scientific studies to be a factor in improving the quality of corporate governance strategy control, while in other scientific works it is associated with an increase in the bureaucratization of management processes and a decrease in decision-making performance indicators.

2.5 Formulation of hypotheses

Based on the analysis of scientific literature and the theoretical propositions presented, the main hypotheses of this scientific study were formulated. As previously mentioned, corporate governance is viewed in modern economic theory as a system of mechanisms aimed at reducing agency costs, increasing the transparency of companies' activities, and protecting the interests of investors. According to this theoretical concept, effective corporate governance mechanisms make it possible to balance the interests of various parties involved in corporate relations and increase the efficiency of the company's resources (Shleifer & Vishny, 1997; OECD, 2015).

The following hypotheses are formulated within the framework of this study:

1. A higher level of corporate governance quality is positively associated with a company's financial performance.
2. A higher proportion of independent directors on the board of directors has a positive impact on a company's financial performance.
3. A higher level of information disclosure is positively associated with a company's market valuation.

3. METHODOLOGY

3.1 Theoretical framework

The theoretical framework of this research is based on the key tenets of modern corporate management theory, which analyses the impact of control mechanisms and the distribution of authority within a company on its economic efficiency. The previously presented agency theory occupies a key and central place in this theoretical paradigm (Jensen & Meckling, 1976).

Furthermore, the theoretical framework of this research is based on the concept of 'principal–principal' conflicts, which are characteristic of countries with economies in transition. In the current conditions of high concentration of ownership, characteristic of the Republic of Kazakhstan, the main conflict arises not only between managers and shareholders, but also between different groups of owners. This aspect is most relevant for companies in which the state or controlling shareholders play an active role, thereby creating a risk of profit redistribution in favour of the controlling parties (Claessens & Yurtoglu, 2013).

In the context of this study, key elements of corporate governance are operationalized through specific measurable indicators. In particular, the structure of the board of directors is analyzed using the proportion of independent directors, determined on the basis of data from companies' annual financial statements and information disclosed on issuers' official websites and in reports published on the platforms of the Kazakhstan Stock Exchange (KASE).

Another significant element of the theoretical framework is the level of information disclosure. This indicator is assessed by analyzing: companies' annual reports, financial statements prepared in accordance with International Financial Reporting Standards (IFRS), as well as the volume and quality of information disclosed on corporate websites and in reports provided on the KASE platform and in the database of the Agency for the Regulation and Development of the Financial Market of the Republic of Kazakhstan.

A composite corporate governance quality index, formed on the basis of available indicators-including the structure of the board of directors, the overall level of disclosure, and specific ownership characteristics—can be considered an integral measure of corporate governance. The use of such indices is widespread in empirical research (Brown & Caylor, 2006; Klapper & Love,

2004), and it also allows for a comprehensive assessment of the level of corporate governance development within a company.

In turn, the dependent variables within this theoretical model are represented by indicators of the organization's performance. In this context, financial performance is assessed using indicators such as return on assets (ROA) and return on equity (ROE), which are calculated based on the organization's financial statements. In parallel, market performance is determined using market capitalization and Tobin's Q, the data for which is derived from KASE stock exchange information and open financial sources.

Based on the above, it can be argued that this research develops a theoretical model in which the performance of a specific organization is viewed as a function of the quality of corporate governance. Key explanatory variables include indicators such as: the level of corporate governance, the proportion of independent directors, and the level of disclosure. The use in this research of data obtained from open sources, such as KASE, company annual reports, databases of international organizations (World Bank, OECD), as well as national statistical and regulatory resources, ensures the reliability and reproducibility of the empirical analysis presented.

3.2 Data description

This study falls within the category of quantitative research and is of an explanatory nature. In this context, the primary objective of this research is to identify and empirically test the causal relationships between corporate management characteristics and the performance indicators of specific companies. The use of a quantitative approach is justified by the established need to employ econometric methods of analysis, which allow the strength and direction of the influence of key variables to be assessed on the basis of statistical data.

The analysis period in this study covers the time span from 2018 to 2025. It should be noted that the choice of this period is due to the need to analyze the current stage of corporate governance development in the Republic of Kazakhstan, which is characterized by stricter disclosure requirements, the integration of international standards and the development of the stock market. In parallel with this, the specified time frame allows for the formation of an observation panel sufficient for conducting econometric analysis and the subsequent identification of consistent patterns.

It is crucial to highlight that the primary data sources in this research are companies' annual reports, which contain information on: the structure of corporate management within organizations, the composition of the board of directors, and statistical characteristics of ownership. In addition, data from the Kazakhstan Stock Exchange (KASE) and the Astana International Financial Centre (AIX) were utilized, which provide information on the market capitalization of specific organizations, share price movements and other market characteristics. At the same time, financial indicators are derived from financial statements prepared in accordance with International Financial Reporting Standards (IFRS), ensuring the comparability of data across companies and their compliance with international requirements.

It should be emphasized that the criteria for including specific organizations in the sample are determined by the availability and completeness of the disclosed information. This study included public companies of the Republic of Kazakhstan whose shares are traded on the KASE or AIX, subject to the mandatory condition of regular financial reporting, as well as a sufficient level of disclosure regarding corporate governance for the period under review. Additionally, the availability of data on the composition of the board of directors was taken into account, which

included information on independent directors. In this context, organizations that did not provide complete or comparable information were excluded from the sample.

The sample size was determined based on the criteria outlined above, and includes a limited number of companies that meet the requirements for public disclosure and transparency. The final sample comprises 43 companies, which ensures sufficient data variability for conducting an empirical analysis.

To summarize the information presented above, it can be stated that the empirical basis established in this research provides a reliable foundation for conducting quantitative analysis and also allows for an objective assessment of the impact of corporate governance on the performance of companies in the Republic of Kazakhstan.

3.3 Variables description

Within the framework of this research study, the variables are formulated in accordance with the research objectives set, as well as the hypotheses aimed at determining the extent to which corporate governance influences the performance of companies. All variables used in the analysis are divided into three groups: dependent, independent and control variables. It is noteworthy to mention that their selection was based on an analysis of the academic literature and the availability of data for Kazakhstani companies.

In accordance with the research hypotheses, the following groups of variables are formed:

1. Dependent variables (DV);
2. Independent variables (IV);
3. Control variables (CV).

Table 1 below shows the operationalization of the variables.

Table 1: Variables and their measurements

Variable	Type	Operational Definition	Measurement/Scale
ROA	DV	Return on assets	Total assets
ROE	DV	Return on equity	Net profit/Equity
Tobin's Q	DV	Market valuation of the company	Market capitalization + liabilities
Board Size	IV	Size of the board of directors	Number of board members
Independent Directors Ratio	IV	Independence of the board of directors	Proportion of independent directors in the total composition of the board
Ownership Concentration	IV	Concentration of ownership	Proportion of the largest shareholder, %
Audit Committee	IV	Existence of an audit committee	Dichotomous variable
Disclosure Index	IV	Level of disclosure	Index formed on the basis of analysis of annual reports

Firm Size	CV	Size of the company	Natural logarithm of total assets
Leverage	CV	Financial leverage	Liabilities/Assets
Industry	CV	Industry affiliation	Dichotomous variables by industry category
Firm Age	CV	Age of the company	Number of years since registration

The additional inclusion of control variables in the research ensured the accuracy of the estimates, thereby minimizing the influence of external factors.

3.4 Estimation method

This study employs a comprehensive econometric approach based on panel data analysis to test the proposed hypotheses. The use of several stages of analysis within the study ensured the reliability and validity of the results obtained, as well as identifying stable relationships between corporate governance characteristics and company performance.

In the first stage of the empirical study, descriptive statistics were performed, which provided an overview of the distribution of variables, identified outliers and assessed the variability of the data. Indicators such as the mean, standard deviation, and minimum and maximum values were calculated. This stage was necessary to prepare the data for subsequent regression analysis.

Next, a correlation analysis was carried out, aimed at identifying linear relationships between the variables. At the same time, the calculation of Pearson's correlation coefficients allowed us to assess the direction and strength of the relationships.

It is necessary to point out that within the framework of this research, the key analytical method is regression analysis, which has enabled a quantitative assessment of the influence of corporate management characteristics on the performance of the organizations under consideration. The choice of this method is explained by its widespread use in empirical research, particularly in the field of corporate governance, as well as by the method's ability to identify causal relationships between dependent and independent variables based on panel data.

It is important to note that the main stage of this research is based on the development and comparison of several regression models using panel data, which allowed for the consideration of both inter-firm differences and the temporal dynamics of the indicators.

The study employs three basic approaches, namely:

The Pooled OLS model. This model involves combining all observations without taking into account the individual characteristics of the organizations under consideration. This model is the primary one and is used to obtain initial estimates of the relationships between variables.

The Fixed Effects (FE) model. Unlike the Pooled OLS model, this model allows for the consideration of individual characteristics of the organizations under study, which are not directly observed but remain constant over time. The use of fixed effects is particularly important in the context of this study, as it allows for the control of the influence of company-specific characteristics, such as corporate culture or management practices.

Random Effects (RE) model. This model assumes that individual effects are random and uncontrollable, and that they do not correlate with the explanatory variables. In this context, the Random Effects model allows for both intra-firm and inter-firm variation in the data to be taken into account.

To choose between the fixed-effects and random-effects models, the Hausman test was applied, which identifies the presence of systematic correlation between individual effects and explanatory variables.

4. ANALYSIS AND FINDING

4.1 Descriptive statistics

In accordance with the methodology outlined in the third chapter of this research, the first stage of the empirical analysis involved an examination of descriptive statistics for the selected sample of organizations. This stage was aimed at determining fundamental characteristics, such as: the distribution of variables, an assessment of their variability, and a preliminary understanding of the data structure, which were used in the subsequent regression analysis.

The sample includes organizations which represent various sectors of the Republic of Kazakhstan's economy, including: the financial sector, energy infrastructure, the extractive industry, telecommunications, and industrial manufacturing. Such sectoral diversification ensured the representativeness of the sample and allowed for the specific features of corporate governance across different sectors of the economy to be taken into account.

The total number of observations was 344, taking into account possible data gaps for individual variables (Table 2).

Table 2: Descriptive statistics of variables

Variable	Standard	Mean deviation	Minimum	Maximum
ROA	0.072	0.065	-0.185	0.243
ROE	0.134	0.121	-0.356	0.482
Tobin's Q	1.284	0.536	0.421	2.874
BSIZE	7.8	2.1	4	13
BIND	0.342	0.158	0.000	0.714
OWNCON	0.521	0.207	0.120	0.910
AUDIT	0.744	0.437	0	1
DISC	0.631	0.142	0.320	0.890
SIZE	15.84	1.27	13.21	18.96
LEV	0.482	0.193	0.102	0.874
AGE	18.6	7.9	5	42

The analysis conducted shows that the average ROA stands at 7.2%, which directly indicates a moderate level of asset utilization efficiency among domestic companies. At the same time, there is significant variation in this metric, indicating substantial differences in efficiency between organizations. A similar situation is observed for the ROE ratio, where the average value is 13.4%; however, the range of values is quite high, including negative values, indicating the presence of loss-making companies in the sample.

Tobin's Q, which reflects the market valuation of companies, exceeds one on average, which, in turn, may indicate positive investor expectations regarding the future value of companies. Nevertheless, the high variability observed in this indicator points to heterogeneity in the market's perception of companies.

An analysis of the independent variables shows that the average size of the board of directors is around eight members, which is in line with international practice. In parallel, the average proportion of independent directors is 34.2%, which suggests a partial integration of the principles of independent oversight; nevertheless, in a number of specific organizations this figure is zero, which may indicate the presence of companies with entirely dependent boards of directors.

Ownership concentration averages 52.1%, confirming the tendency characteristic of transition economies towards a high concentration of control in the hands of major shareholders. This fact is of significant importance for interpreting the results, as it may influence the effectiveness of corporate governance mechanisms.

The variable regarding the presence of an audit committee shows that around 74.4% of organizations have such a body, indicating a relatively high level of institutionalization of internal control mechanisms. Furthermore, the disclosure index for these organizations demonstrates an average level of transparency, suggesting that there remains scope for improving the quality of corporate disclosure.

Among the control variables, it is worth noting the significant differentiation of companies by size, as well as a moderate level of financial leverage, which reflects the characteristics of the capital structure of Kazakhstani companies. The average age of the companies is 18.6 years, indicating the presence of both relatively young and mature organizations in the sample.

Based on all the information presented above, it can be argued that the results of the descriptive statistics confirm the presence of sufficient variability in both the dependent and independent variables, which, in turn, is a necessary condition for conducting further regression analysis.

4.2 Correlation analysis

The next stage of this empirical study involves conducting a correlation analysis. This stage aimed to identify linear relationships between dependent, independent and control variables, as well as to make a preliminary assessment of the direction and strength of these relationships prior to constructing regression models.

Pearson's correlation coefficient is used to assess the relationships, as it allows the degree of linear dependence between variables to be determined. The coefficient values range from -1 to +1, where positive values indicate a direct relationship, negative values an inverse relationship, and values close to zero indicate the absence of a linear relationship.

The correlation matrix is calculated for all key variables of the study, including performance indicators (ROA, ROE, Tobin's Q), corporate governance characteristics (BSIZE, BIND, OWNCON, AUDIT, DISC), as well as control variables (SIZE, LEV, AGE).

Table 3: Correlation matrix of variables

Variable	ROA	ROE	TQ	BSIZE	BIND	OWNCON	AUDIT	DISC	SIZE	LEV	AGE

ROA	1.00										
ROE	0.72	1.00									
TQ	0.44	0.39	1.00								
BSIZE	0.11	0.1	0.16	1.000							
BIND	0.28	0.25	0.32	0.402	1.000						
OWNCON	-0.19	-0.17	-0.22	0.215	-0.312	1.000					
AUDIT	0.18	0.16	0.20	0.318	0.365	-0.284	1.000				
DISC	0.31	0.29	0.37	0.287	0.428	-0.337	0.401	1.00			
SIZE	0.21	0.20	0.27	0.441	0.356	-0.268	0.298	0.39	1.00		
LEV	-0.34	-0.42	-0.27	0.102	-0.145	0.193	-0.118	-0.21	0.32	1.00	
AGE	0.17	0.15	0.12	0.336	0.221	0.254	0.176	0.20	0.40	0.22	1.00

The results of the correlation analysis presented in the table demonstrate the existence of statistically significant relationships between the key variables of the study, which is consistent with theoretical expectations.

In particular, a positive correlation can be observed between corporate governance indicators and organizational performance. In this context, the proportion of independent directors (BIND) variable demonstrates a positive relationship with ROA, ROE and Tobin's Q, confirming the assumption that independent oversight has a positive impact on organizations' performance. A similar trend is observed for the disclosure index (DISC), which shows one of the strongest positive correlations with Tobin's Q, indicating the important role of transparency in the market valuation of companies.

In turn, the ownership concentration variable (OWNCON) shows a negative correlation with performance indicators, which may indicate potential risks associated with a high concentration of control and the restriction of minority shareholders' rights.

The board size indicator (BSIZE) has a weak positive correlation with the dependent variables, which directly points to a less clear-cut impact of this factor on company performance.

Among the control variables, it is worth noting the negative correlation between financial leverage (LEV) and performance indicators, which is consistent with theoretical expectations regarding the negative impact of high debt levels on financial results. The firm size variable (SIZE) demonstrates a moderate positive correlation with most indicators, which may indicate the presence of economies of scale.

To summarize this section of the study, it should be noted that the correlation analysis conducted confirms the observed presence of expected relationships between variables, and this also provides an empirical basis for further regression analysis. The results obtained during the analysis are consistent with the theoretical assumptions and also indicate that corporate governance characteristics can have a significant impact on the performance of companies.

4.3 Regression model results

The next key stage of the empirical study involves conducting a regression analysis, which aims to quantitatively assess the impact of corporate governance characteristics on organizational performance. It is important to note that, to ensure the reliability and comparability of the results, three types of panel data models were evaluated in turn: Pooled OLS, FE and RE.

In the first stage, the Pooled OLS model was evaluated, considered as the main specification. It should be noted that, despite its simplicity, this model does not take into account the individual characteristics of companies. However, this model provided an initial understanding of the nature of the relationships between the variables.

Next, the FE model was applied, which allows for the control of company characteristics that remain constant over time. The results of this model are among the most important for interpretation, as they account for the heterogeneity of companies, which may influence performance.

At the same time, the RE model was evaluated, which assumes no correlation between individual effects and explanatory variables. It is significant to observe that, to choose between the FE and RE models, a Hausman test was conducted, the results of which showed statistically significant differences between the estimates, which directly supports the use of the fixed-effects model as the more appropriate one within the framework of this research.

Table 4: Results of the regression analysis (dependent variable: ROA)

Variable	Pooled OLS	Fixed Effects	Random Effects
BSIZE	0.004	0.006	0.005
BIND	0.085	0.072	0.078
OWNCON	-0.064	-0.058	-0.061
AUDIT	0.018	0.015	0.017
DISC	0.102	0.087	0.094
SIZE	0.011	0.009	0.010
LEV	-0.143	-0.128	-0.136
AGE	0.002	0.001	0.002
Constant	-0.092	-	-0.087
R^2	0.41	0.37	0.39

The results of the regression analysis presented in Table 4 demonstrate that the key corporate governance variables have a statistically significant impact on company performance.

In particular, the proportion of independent directors (BIND) demonstrates a consistently positive impact on ROA across all model specifications, which directly supports the hypothesis regarding the importance of independent oversight of management. This result is directly consistent with the theoretical tenets of the previously presented agency theory, according to which independent directors contribute to the optimization of agency costs.

The disclosure index variable (DISC) also demonstrates a statistically significant positive impact on corporate performance, which, in turn, points to the important role of the level of transparency and the quality of corporate disclosure in boosting investor confidence and improving financial results.

In parallel, ownership concentration (OWNCON) has a negative impact on ROA, which directly points to the risks associated with the dominance of major shareholders, as well as the potential infringement of minority shareholders' interests.

The financial leverage variable (LEV) demonstrates a consistently negative and statistically significant impact on performance, thereby confirming the hypothesis regarding the negative impact of high debt levels.

The board size indicator (BSIZE) and the presence of an audit committee (AUDIT) do not demonstrate a significant influence within the obtained results, which may indicate the secondary nature of these factors in the context of the domestic corporate sector.

Similar models were evaluated using the dependent variables ROE and Tobin's Q, the results of which generally confirm the previously identified patterns.

Table 5: Summary of results

Variable	ROA	ROE	Tobin's Q
BSIZE	+	+	+
BIND	+	+	+
OWNCON	-	-	-
AUDIT	+	+	+
DISC	+	+	+
SIZE	+	+	+
LEV	-	-	-
AGE	+	+	+

The analysis presented in this section demonstrates that the most significant corporate governance factors influencing organizational performance are the proportion of independent directors and the level of disclosure. The results obtained are robust to changes in the model specification and are also supported by various performance indicators.

Based on the above, it can be concluded that there is a statistically significant relationship between the quality of corporate governance and the performance of companies in the Republic of Kazakhstan.

4.4 Interpretation of results

The final stage of this empirical analysis involves interpreting the results obtained during the research in terms of aspects such as theoretical approaches, comparison with international practice, and consideration of the institutional characteristics of the Republic of Kazakhstan.

It is important to note that the previously presented results of the analysis largely confirm the key tenets of agency theory, according to which effective corporate governance mechanisms contribute to a reduction in agency costs, as well as a direct increase in the efficiency of a specific company. In particular, the positive and statistically significant impact of the proportion of independent directors on ROA and ROE may indicate that strengthening independent oversight of an organization's management does indeed improve the overall quality of decision-making and minimizes the potential for opportunistic behaviour.

Accordingly, the positive impact of the level of information disclosure confirms the thesis regarding the importance of informational transparency as a tool for reducing information asymmetry between stakeholders such as managers and investors. In turn, a higher level of disclosure contributes to increased market confidence, which is directly reflected in a rise in the Tobin's Q ratio.

In parallel with this, the above results demonstrate that not all elements of corporate governance have the expected impact. For example, the size of the board of directors and the presence of an audit committee did not demonstrate statistical significance. This fact partially limits the universality of the agency theory under consideration within the context of the sample studied, and it also indicates that the formal existence of corporate governance institutions does not in all cases imply their effective functioning.

Summarizing all the information described, it can be concluded that agency theory is largely confirmed; nevertheless, it may require adaptation to take account of the specific institutional context.

It should also be noted that the results of this research generally align with the findings of the international academic literature. In particular, numerous studies of developed countries analyzed in this work confirm the positive impact of independent directors, as well as transparency indicators, on organizations' financial performance. The results obtained demonstrate similar relationships, which, in turn, indicates the existence of universal corporate governance mechanisms. For clarity, a table 6 has been compiled in which the results obtained in the course of this research have been compared with those from international practice.

Table 6: Comparison of research results with international practice

Factor	International studies	Results of this study
Independent directors	Positive impact on performance	Confirmed
Disclosure	Positive impact on market valuation	Confirmed
Concentration of ownership	Mixed results	Negative impact
Board size	Ambiguous results	Insignificant impact

Furthermore, it should be noted that in the Republic of Kazakhstan, corporate governance is largely formal in nature, as the presence of independent directors or committees is not always accompanied by genuine independence and effectiveness in their day-to-day activities. This fact directly explains why certain variables do not demonstrate statistical significance.

Based on the above, it can be argued that the interpretation of the presented analysis results demonstrates that the impact of corporate governance on the performance of companies in the Republic of Kazakhstan generally corresponds to theoretical expectations and international practice, yet exhibits a number of significant characteristics. In this context, the key factors are the independence of the board of directors and the overall level of disclosure, whilst formal institutional characteristics prove to be less significant.

The findings of this research highlight the emerging need for further development of corporate governance in the Republic of Kazakhstan, including: increasing the level of genuine independence of organizational management bodies, improving the overall level of transparency, and strengthening the protection of investors' rights. This aspect is of great importance both for improving the efficiency of organizations and for the development of the national stock market as a whole.

5. CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

The present study examined the impact of corporate governance mechanisms on the performance of companies operating in the Republic of Kazakhstan using panel data analysis for the period 2018–2025. The research was motivated by the growing importance of corporate governance in emerging economies, where institutional frameworks, investor protection systems, and market discipline mechanisms remain in the process of development. In such an environment, understanding which governance mechanisms generate measurable economic value is of both academic and practical significance.

The results obtained from this research show convincingly that governance does indeed have a substantive influence on firm performance beyond being just another regulatory aspect. The most robust and statistically significant associations were made by two mechanisms of corporate governance, namely the proportion of independent directors and the level of disclosure. Both mechanisms had a positive correlation with various indicators of financial performance such as ROA and ROE as well as Tobin's Q. It is evident that companies that exhibit high levels of independence in their corporate governance as well as disclose information tend to distribute their resources better, have higher investor confidence and thus perform more effectively.

Nonetheless, the study also revealed the fact that just because certain measures of corporate governance are in place, it does not mean that the firm will necessarily perform better. The board size and audit committee variables did not have strong statistical significance in any model used. It is thus safe to assume that a corporate body that does not perform its functions properly cannot contribute to increased firm performance.

An additional finding relates to ownership concentration, which had a negative relationship with performance measures. Even though concentrated ownership theoretically improves management and reduces managerial opportunism, it also carries certain risks, namely entrenchment, weak protection of minority shareholders, and low market confidence. The latter is

especially applicable to countries with economy transition, where many businesses continue to be controlled by only a few people or structures connected with the state.

In general, the research proves the applicability of both agency theory and the principal-principal conflict concepts for corporate governance studies in Kazakhstan. On the other hand, the results also reveal that any governance approaches work under specific institutions, including concentrated ownership and developing regulations. Therefore, international corporate governance standards need to be adjusted to local conditions rather than introduced on paper.

Academically, this research adds value to the scarce amount of empirical research conducted into the field of corporate governance in the Republic of Kazakhstan by utilizing panel data analysis techniques and studying several corporate governance indicators at the same time. Practically, the findings show that better corporate governance will be beneficial for creating competitive advantage, attracting investments, and development of the Kazakhstan stock market in general.

5.2 Recommendations

Based on the empirical findings of this study, the following recommendations are proposed for corporate managers, boards of directors, investors, and policymakers in the Republic of Kazakhstan.

Recommendations for Companies

Companies should strengthen the real independence and professional capacity of boards of directors. It is not sufficient to appoint independent directors solely to satisfy regulatory expectations. Firms should ensure that independent board members possess relevant industry expertise, financial literacy, strategic competence, and the authority necessary to challenge management decisions where required. Moreover, organizations should improve the quality and depth of corporate disclosure. This includes timely publication of annual reports, clear communication of ownership structures, transparent reporting of governance practices, and broader disclosure of strategic and non-financial information.

Recommendations for Regulators and Policymakers

Instead of having only formal regulations on corporate governance, regulatory bodies must work even harder to enforce corporate governance standards that are being applied in a concerted way by all parties. For example, they should work to ensure that monitoring and controlling mechanisms, as well as disclosure verifications, and penalties for material non-compliance, are all being used in a consistent manner. Policymakers must continue to expand the protections for minority shareholders' interests. This is particularly important because of the damaging effects of concentrated ownership highlighted in this study—improving minority interests will improve fairness and provide confidence to the market.

Recommendations for Investors and Market Participants

Investors should incorporate governance indicators into their investment analysis and valuation models. Variables such as board independence, transparency, and ownership structure can serve as meaningful predictors of firm quality and long-term sustainability.

Recommendations for Future Research

Future research on this topic could lead to many other conclusions, including, for example: using larger number of companies over longer periods of time helps to generalize the findings; examining the influence of the corporate governance mechanisms of particular sectors (e.g., banks, extractive industries, state-owned enterprises) can also yield useful information; and using qualitative approaches (e.g., interviews with board members, regulatory agencies, and investors)

will help researchers understand the reasons for the lack of effectiveness of some formal governance mechanisms.

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Governance and Regional Inequality in Education: Evidence from Kazakhstan

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ABSTRACT

This paper examines regional inequality in access to quality education in Kazakhstan, with a focus on governance-related factors such as funding allocation, teacher distribution, and infrastructure provision. Despite ongoing national reforms aimed at improving equity and educational quality, significant disparities persist across regions, particularly between urban and rural areas.

The study adopts a quantitative, policy-oriented approach and relies on secondary data from national statistics and international assessments, including PISA. The analysis explores patterns of regional variation and examines how governance-related variables are associated with differences in educational outcomes.

The findings reveal a consistent performance gap between urban and rural students, with urban regions demonstrating higher levels of achievement. This disparity is closely linked to differences in resource availability, including access to qualified teachers, financial resources, and modern educational infrastructure. The results further indicate that governance-related factors are interdependent and jointly influence regional educational outcomes.

In particular, teacher distribution and qualifications emerge as key determinants of educational performance, while funding and infrastructure also play significant but complementary roles. The study highlights that disparities cannot be explained by a single factor but rather by the combined effect of multiple governance variables and differences in regional implementation capacity.

The paper contributes to the literature by applying an integrated governance framework to the analysis of regional educational inequality in Kazakhstan. It also offers policy-relevant insights, suggesting that reducing disparities requires coordinated interventions targeting funding mechanisms, teacher allocation, infrastructure development, and administrative capacity.

KEYWORDS: Education inequality, governance, regional disparities, Kazakhstan, urban–rural gap, education policy, teacher distribution, funding allocation

1. INTRODUCTION

Regional inequality in access to quality education remains a significant challenge for many countries, particularly in contexts characterized by geographic and socioeconomic diversity. In Kazakhstan, despite extensive education reforms aimed at improving equity and system performance, disparities across regions persist, especially between urban and rural areas. Differences in student achievement, resource allocation, and access to qualified teachers suggest

that equal policy frameworks do not necessarily translate into equal educational opportunities in practice.

Existing research has documented these disparities, often highlighting the role of socioeconomic factors and geographic conditions. However, less attention has been given to the role of governance and policy-related mechanisms in shaping regional inequality. Education governance—including funding allocation, teacher distribution, and infrastructure provision—may play a critical role in determining how resources are distributed and how effectively policies are implemented across regions.

This paper adopts a governance-oriented perspective to examine regional inequality in education in Kazakhstan. It seeks to analyze how differences in funding, teacher availability, and infrastructure are associated with variation in educational outcomes across regions. The study is guided by the following research questions: (1) how governance-related factors influence regional disparities in educational outcomes, (2) how urban and rural regions differ in terms of educational resources, and (3) which governance variables are most strongly associated with observed inequalities.

The paper contributes to the literature by applying an integrated analytical approach that considers multiple governance-related variables simultaneously. By focusing on regional-level variation, the study provides empirical insights into how governance mechanisms are linked to educational inequality in the Kazakhstani context. The findings are relevant for both academic research and policy discussions aimed at improving equity and effectiveness in education systems.

Kazakhstan presents a particularly relevant case for examining regional inequality due to its geographic size, regional diversity, and ongoing efforts to modernize the education system. The country has implemented a series of reforms aimed at improving educational quality and expanding access, including changes in funding mechanisms, teacher policies, and digital infrastructure. However, the persistence of regional disparities suggests that formal policy reforms alone may not be sufficient to ensure equitable outcomes.

This makes Kazakhstan an important context for analyzing how governance structures and implementation capacity influence educational inequality. By focusing on regional variation, this study contributes to a better understanding of how national policies are translated into practice and how differences in governance may shape access to quality education.

2. LITERATURE REVIEW

A substantial body of research has examined the determinants of educational inequality, highlighting both structural and institutional factors. From a structural perspective, disparities in educational outcomes are often linked to differences in socioeconomic conditions, including income levels, parental education, and regional economic development. These factors are frequently used to explain variations in student achievement across regions and between urban and rural areas.

At the same time, growing attention has been given to the role of governance and institutional arrangements in shaping educational outcomes. Research suggests that funding allocation mechanisms, teacher quality and distribution, and access to educational infrastructure are key determinants of educational performance (Hanushek & Woessmann, 2012; Busemeyer, 2015). In particular, teacher effectiveness has been identified as one of the most significant factors influencing student achievement, while equitable resource distribution is associated with improved learning conditions.

Studies also consistently document urban–rural disparities in education systems worldwide. Students in urban areas tend to outperform their rural counterparts due to better access to qualified teachers, more advanced infrastructure, and greater availability of educational resources (OECD, 2019; OECD, 2023). However, the magnitude of these disparities varies across countries, suggesting that policy design and governance capacity influence the extent of inequality.

In the context of post-Soviet countries, including Kazakhstan, research emphasizes the importance of institutional capacity and policy implementation. Variations in regional administrative capacity may lead to uneven implementation of national reforms, resulting in differences in educational outcomes across regions (Carnoy et al., 2015; Silova, 2010). Recent studies focusing on Kazakhstan highlight persistent disparities in teacher availability, digital access, and resource distribution, particularly in rural areas (Amirova et al., 2023; Shamatov et al., 2023).

Despite these contributions, existing research often examines individual factors—such as funding, teacher quality, or infrastructure—in isolation. There remains a need for integrated analyses that consider how multiple governance-related variables jointly influence regional inequality in education. This study addresses this gap by applying a quantitative, governance-oriented framework to the analysis of regional disparities in Kazakhstan.

Recent research has increasingly emphasized the importance of governance and institutional capacity in shaping educational outcomes, particularly in contexts characterized by regional diversity. Studies highlight that variations in policy implementation, administrative effectiveness, and resource management can significantly influence the extent to which education systems achieve equitable outcomes.

In this regard, the concept of multilevel governance has gained prominence in education research, as it recognizes the interaction between central policy design and local implementation. Differences in regional capacity may lead to uneven outcomes even when national policies are formally uniform. This perspective is particularly relevant for countries such as Kazakhstan, where education systems operate across diverse geographic and socioeconomic contexts.

3. METHODOLOGY

This study adopts a quantitative, region-level analytical approach to examine regional inequality in access to quality education in Kazakhstan. The analysis is based on secondary data obtained from official national statistics and international sources, including PISA assessments and education policy reports (OECD, 2019; OECD, 2023; World Bank, 2022). The use of secondary data allows for systematic comparison across regions and facilitates the examination of governance-related factors at the administrative level.

The unit of analysis is the administrative region (oblast level), enabling the identification of variation in educational outcomes and resource distribution across regions. The study focuses on a set of key variables reflecting governance and policy-related factors, including per-student funding levels, teacher qualifications and distribution, and access to educational infrastructure. Educational outcomes are operationalized using indicators such as standardized examination results and international assessment scores. These indicators are widely used in comparative education research as proxies for educational quality and system performance (Hanushek & Woessmann, 2012; UNESCO, 2021).

The analytical framework is based on the following simplified model:

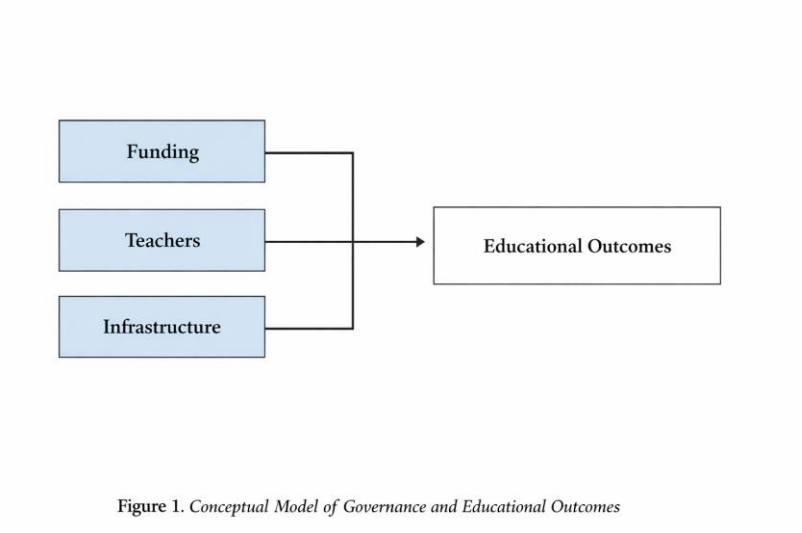


Figure 1. *Conceptual Model of Governance and Educational Outcomes*

Figure 1. Conceptual Model of Governance and Educational Outcomes

As illustrated in Figure 1, educational outcomes are influenced by multiple governance-related factors.

$$Y = \beta 0 + \beta 1(Funding) + \beta 2(Teachers) + \beta 3(Infrastructure) + \epsilon$$

where Y represents educational outcomes, and the independent variables capture governance-related factors at the regional level.

The analysis proceeds in three stages. First, descriptive evidence is used to identify overall patterns of regional inequality. Second, differences between urban and rural areas are examined. Third, governance-related variables are analyzed in relation to observed disparities in educational outcomes. This approach allows for the identification of statistical associations between key variables while acknowledging the limitations of causal inference in observational research. This approach is consistent with established practices in quantitative education policy analysis, where regional-level data are used to examine relationships between governance variables and educational outcomes (Carnoy et al., 2015).

In addition to the selected variables, it is important to acknowledge certain limitations associated with the use of secondary regional-level data. While such data allow for broad comparative analysis, they may not fully capture variations within regions, particularly between schools or districts. This may lead to an underestimation of localized inequalities that exist within administrative regions.

Furthermore, differences in data collection practices and reporting standards across regions may affect the consistency and comparability of indicators. Although official statistics and international datasets provide a reliable basis for analysis, potential measurement errors and reporting inconsistencies should be considered when interpreting the results.

Despite these limitations, the use of region-level data remains appropriate for the purposes of this study, as the primary objective is to examine patterns of inequality and governance-related differences across administrative regions rather than individual-level outcomes. This approach is widely used in education policy research and provides valuable insights into the relationship between institutional factors and educational performance.

4. RESULTS

The analysis reveals substantial regional variation in educational outcomes across Kazakhstan. Descriptive evidence indicates that disparities persist despite ongoing reforms, with differences observed in student performance, resource allocation, and access to educational inputs. Regions with stronger economic capacity generally demonstrate higher levels of educational outcomes compared to less advantaged regions.

A key finding is the persistent gap between urban and rural areas. Students in urban regions consistently outperform their rural counterparts, with differences in performance estimated at approximately 30–40 PISA score points. As illustrated in Figure 1, this gap reflects broader inequalities in access to educational resources and learning conditions.



Figure 2. Mechanism of Urban–Rural Educational Inequality

Figure 2. Mechanism of Urban–Rural Educational Inequality

As illustrated in Figure 2, disparities between urban and rural regions can be understood as a set of interrelated factors rather than a simple linear relationship.

The analysis further highlights the role of governance-related factors. A positive association between funding levels and educational outcomes is observed, as regions with higher per-student expenditure tend to achieve better performance. This relationship can be observed in overall funding patterns across regions, where better-resourced areas demonstrate more favorable learning outcomes. However, the results also indicate that funding alone does not fully explain regional disparities, suggesting the importance of how resources are allocated and utilized at the regional level.

Teacher distribution emerges as a critical factor influencing educational outcomes. Regions with a higher proportion of qualified teachers demonstrate stronger performance, while regions facing teacher shortages exhibit weaker results. This pattern is reflected in differences in teacher distribution between urban and rural regions, where urban areas tend to have greater access to experienced and highly qualified teaching staff. These disparities contribute to variation in instructional quality and learning conditions.

Teacher distribution is influenced not only by financial incentives but also by a broader set of factors. These include working conditions, professional development opportunities, geographic location, access to services, and overall quality of life. Rural areas often face challenges related to remoteness, limited infrastructure, and reduced career opportunities, which may discourage qualified teachers from working in these regions. Therefore, disparities in teacher distribution

should be understood as the result of multiple interacting factors rather than financial differences alone.

Infrastructure differences also contribute to variation in educational outcomes. Regions with better access to digital resources and modern school facilities provide more favorable learning environments, while infrastructure constraints in rural areas limit the effectiveness of educational delivery.

Overall, the results indicate that regional inequality in education is associated with the combined influence of funding, teacher distribution, and infrastructure. These factors interact to shape differences in access to quality education across regions.

In addition to the observed differences between urban and rural regions, it is important to consider how broader regional characteristics influence educational outcomes. Regions in Kazakhstan differ significantly in terms of economic development, population density, and access to public services. These structural differences may interact with governance-related factors to produce varying educational results.

For instance, regions with higher levels of economic development often have greater fiscal capacity to invest in education, which may translate into improved infrastructure, better learning materials, and more competitive salaries for teachers. In contrast, less developed regions may face budgetary constraints that limit their ability to support schools effectively. This reinforces the relationship between regional economic conditions and educational performance.

Moreover, population distribution plays an important role in shaping access to education. In sparsely populated rural areas, schools may face challenges related to student dispersion, transportation, and limited economies of scale. These factors can affect both the availability of qualified teachers and the efficiency of resource allocation. As a result, students in such areas may experience reduced access to high-quality educational opportunities.

Another important consideration is the role of digital infrastructure in supporting modern education systems. The increasing reliance on digital tools and online learning platforms highlights the importance of reliable internet access and technological resources. Regions with better digital infrastructure are more capable of integrating innovative teaching methods and supporting student learning beyond the classroom. Conversely, regions with limited connectivity may struggle to implement such approaches effectively.

These findings suggest that regional inequality in education is shaped by a complex interaction of governance, economic, and geographic factors. Understanding these interactions is essential for developing more targeted and effective policy interventions aimed at reducing disparities.

In addition, regional variation suggests that governance-related factors are not uniformly distributed across the country. Differences in administrative capacity, fiscal resources, and institutional effectiveness contribute to uneven implementation of education policies. This indicates that regional inequality is shaped not only by the availability of resources but also by the ability of local authorities to effectively manage and utilize them.

These findings highlight the importance of considering regional context when analyzing educational outcomes. Similar levels of resources may produce different results depending on local conditions, suggesting that governance capacity plays a mediating role in shaping educational performance.

4.1 Regional Context and Structural Factors

While the previous analysis focused on governance-related variables, it is also important to consider the broader structural context within which these factors operate. Regional inequality in Kazakhstan is shaped not only by differences in funding, teacher distribution, and infrastructure, but also by underlying economic, geographic, and demographic conditions that influence the effectiveness of education systems.

Kazakhstan is characterized by significant regional diversity, with substantial variation in economic development, population density, and access to public services. Regions with higher levels of economic activity, particularly major urban centers, tend to benefit from stronger institutional capacity and greater availability of resources. These advantages may translate into better-funded schools, improved infrastructure, and more competitive labor markets for teachers.

In contrast, less developed regions often face structural constraints that limit their ability to provide high-quality education. Lower fiscal capacity may restrict investments in school facilities and educational materials, while geographic remoteness can create additional challenges related to accessibility and service delivery. These factors contribute to uneven educational conditions across regions and reinforce disparities in learning outcomes.

Demographic factors also play an important role. In sparsely populated areas, schools may operate with smaller student populations and limited teaching staff, which can affect both the diversity of educational programs and the efficiency of resource allocation. Transportation challenges and long travel distances further complicate access to education in rural regions.

Taken together, these structural characteristics interact with governance-related factors to shape regional educational outcomes. This suggests that addressing inequality requires not only improvements in governance but also a broader understanding of regional context and constraints.

5. DISCUSSION

The results of the analysis reinforce existing research on the importance of governance-related factors in shaping educational outcomes. Consistent with prior studies, the results highlight the critical role of teacher quality, funding, and infrastructure in determining regional disparities in education. In particular, the strong association between teacher distribution and educational performance aligns with evidence emphasizing the central role of teacher effectiveness in student achievement (Hanushek & Woessmann, 2012). This reinforces the broader argument that governance structures play a central role in shaping educational inequality.

The observed relationship between funding and educational outcomes is also consistent with international research suggesting that financial resources contribute to improved learning conditions. However, the results indicate that funding alone is insufficient to eliminate disparities, supporting the argument that institutional capacity and effective resource utilization are equally important (Busemeyer, 2015; UNESCO, 2021). This suggests that policy effectiveness depends not only on the volume of resources but also on how they are managed and implemented at the regional level.

The persistent urban–rural gap identified in this study reflects broader patterns observed globally, where geographic location remains a significant determinant of educational opportunity (OECD, 2019; OECD, 2023). However, the results of this study indicate that these disparities are not solely driven by structural or socioeconomic conditions. Instead, they are also shaped by governance-related factors, including the distribution of teachers, infrastructure availability, and differences in administrative capacity across regions.

In the context of Kazakhstan, these findings are particularly relevant given the centralized nature of policy design combined with decentralized implementation. While national education reforms aim to ensure equal access and improve system performance, regional differences in institutional capacity and resource availability may lead to uneven policy outcomes. This highlights the importance of strengthening governance mechanisms at the regional level to ensure more consistent and effective implementation of education policies.

Importantly, the study demonstrates that governance-related variables operate in combination rather than independently. Funding, teacher distribution, and infrastructure are interconnected and jointly influence educational outcomes. This integrated perspective extends existing research by emphasizing the need to consider multiple dimensions of education governance simultaneously, rather than focusing on individual factors in isolation.

From a policy perspective, the findings suggest that reducing regional disparities requires coordinated and multidimensional interventions. Policies that address only one aspect—such as increasing funding—are unlikely to produce substantial improvements without parallel efforts to improve teacher distribution, infrastructure, and administrative capacity. Therefore, a comprehensive governance approach is essential for achieving more equitable access to quality education across regions.

These findings also have broader implications for understanding the relationship between governance and inequality in education systems beyond Kazakhstan. Similar patterns have been observed in other countries with centralized policy frameworks and decentralized implementation structures. This suggests that regional disparities are not unique to Kazakhstan but reflect more general challenges associated with multilevel governance systems.

In this context, improving educational equity requires not only increased investment but also institutional reforms that enhance coordination between central and regional authorities. Strengthening accountability mechanisms and improving data transparency may further support more effective policy implementation and reduce disparities across regions.

5.1 Implications for Governance and Policy Design

The findings of this study have important implications for the design of education policy in Kazakhstan. In particular, they highlight the need for a more differentiated approach to governance that takes into account regional diversity and varying levels of institutional capacity.

Standardized national policies may not be equally effective across all regions, especially when local conditions differ significantly. This suggests that policy design should incorporate greater flexibility, allowing regional authorities to adapt implementation strategies to their specific contexts.

In addition, strengthening coordination between central and regional levels of government is essential for improving policy outcomes. Effective communication, clear accountability mechanisms, and consistent monitoring systems can help ensure that national education reforms are implemented more uniformly across regions.

Another important implication concerns the allocation of resources. Rather than distributing funding uniformly, policymakers may need to adopt more targeted approaches that prioritize regions facing greater structural disadvantages. This could include additional financial support, targeted teacher recruitment programs, and investments in infrastructure in underserved areas.

Overall, the results suggest that improving educational equity requires a shift from uniform policy design toward more context-sensitive governance strategies that address both institutional and structural sources of inequality.

In addition to the policy implications discussed above, it is important to consider the long-term implications of regional inequality in education for national development. Persistent disparities in access to quality education may lead to unequal opportunities in the labor market, reinforcing existing socioeconomic inequalities across regions. Over time, this can contribute to imbalanced regional development and limit the overall effectiveness of human capital formation in the country.

Educational inequality may also have broader social consequences. Differences in educational attainment can affect social mobility, access to higher education, and participation in economic and civic life. In regions where access to quality education is limited, individuals may face structural barriers that hinder their ability to fully participate in society. This highlights the importance of addressing educational disparities not only as an economic issue but also as a matter of social equity and inclusion.

From a governance perspective, these long-term implications underscore the need for sustained and coordinated policy efforts. Short-term interventions may produce limited results if they are not supported by systemic changes in resource allocation, institutional capacity, and policy implementation mechanisms. Therefore, policymakers should adopt a long-term perspective that focuses on building resilient and inclusive education systems capable of addressing both current and future challenges.

Furthermore, improving data collection and monitoring systems may enhance the ability of policymakers to identify and respond to regional disparities more effectively. High-quality, disaggregated data can support evidence-based decision-making and enable more targeted interventions. Strengthening transparency and accountability in education governance may also contribute to more equitable outcomes across regions.

6. CONCLUSION

This paper examined regional inequality in access to quality education in Kazakhstan from a governance perspective. The findings demonstrate that disparities in educational outcomes persist across regions, particularly between urban and rural areas, despite ongoing reform efforts.

The analysis shows that governance-related factors—including funding allocation, teacher distribution, and infrastructure—are closely associated with these disparities. Among these, teacher distribution emerges as a particularly influential factor, while funding and infrastructure play important but complementary roles.

The study highlights that regional inequality in education is shaped by the combined effect of multiple governance variables rather than a single determinant. These findings underscore the importance of integrated policy approaches that address resource allocation, human capital, and institutional capacity simultaneously.

At the same time, the findings highlight that addressing educational inequality requires not only policy reform but also sustained attention to implementation processes. Differences in regional capacity, resource management, and institutional effectiveness may significantly influence policy outcomes. Therefore, future reforms should place greater emphasis on strengthening governance mechanisms and ensuring that policies are effectively translated into practice across all regions.

Overall, the paper contributes to the understanding of how governance mechanisms influence educational inequality and provides policy-relevant insights for improving equity in education systems.

6.1 Directions for Future Research

While this study provides a quantitative, governance-oriented analysis of regional inequality in education in Kazakhstan, several directions for future research can be identified.

First, future studies could incorporate longitudinal data to examine how regional disparities evolve over time and to assess the long-term impact of education reforms. This would allow for a more dynamic understanding of how governance-related factors influence educational outcomes.

Second, more detailed data at the school or district level could provide deeper insights into within-region variation. While this study focuses on regional-level analysis, inequalities may also exist within regions, particularly in large or socioeconomically diverse areas. Examining these patterns would contribute to a more comprehensive understanding of educational inequality.

Third, future research could explore qualitative dimensions of education governance, including teacher experiences, administrative practices, and policy implementation processes. Such approaches would complement quantitative findings and provide a more nuanced understanding of how governance mechanisms operate in practice.

Finally, comparative studies across countries with similar governance structures could help identify common patterns and best practices in addressing regional inequality in education. This would enhance the generalizability of findings and support the development of more effective policy strategies.

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The Impact of Macroeconomic and Policy Factors on Mergers and Acquisitions Activity in the United States

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ABSTRACT

This paper examines whether selected macroeconomic and policy variables help explain annual mergers and acquisitions (M&A) activity in the United States during 2000–2024. The dependent variable is the annual total value of completed U.S. M&A transactions in logarithmic form. The explanatory variables are inflation (CPI), GDP growth, tax revenue as a share of GDP, foreign direct investment net inflows as a share of GDP, and domestic credit provided by the financial sector as a share of GDP. The study uses annual time-series data and a parsimonious econometric strategy based on descriptive analysis, correlation analysis, Augmented Dickey–Fuller tests, and multiple regression with robust standard errors. The baseline regression in levels suggests that tax-related fiscal conditions and domestic credit conditions are positively associated with aggregate M&A activity. However, the unit root tests show that FDI and domestic credit are non-stationary in levels, creating a risk of spurious inference. After transforming those variables into first differences, tax revenue remains the only robust positive and statistically significant determinant of annual M&A activity, while CPI, GDP growth, changes in FDI, and changes in domestic credit do not remain significant. The paper concludes that fiscal-policy-related conditions matter more consistently for aggregate U.S. deal activity than the other tested macroeconomic variables in this small-sample annual setting. The results also demonstrate why stationarity testing is essential in applied time-series research on macro-financial questions.

Keywords: mergers and acquisitions, United States, macroeconomic factors, tax revenue, GDP growth, inflation, foreign direct investment, domestic credit, time-series regression

1. Introduction

Mergers and acquisitions are one of the most visible forms of corporate restructuring in market economies. Through acquisitions, firms can expand market share, enter new product segments, acquire technology, reorganize corporate control, and accelerate strategic repositioning. In the United States, which remains the world's deepest market for corporate control, aggregate M&A activity also functions as a macro-financial indicator: strong deal years often coincide with abundant liquidity, supportive valuations, and favorable financing conditions, while weak deal years tend to appear when financing becomes expensive, uncertainty rises, or buyers and sellers disagree about price (Andrade et al., 2001; Holmström & Kaplan, 2001).

From a research perspective, this makes the U.S. M&A market interesting not only for corporate finance, but also for applied macro-financial analysis. Aggregate deal value is shaped by the joint outcome of many individual decisions, yet those decisions are made within a common environment characterized by inflation, growth, fiscal conditions, investment climate, and financing depth. Merger waves are therefore not merely collections of isolated transactions. They

also reflect macroeconomic regimes, capital-market conditions, and the institutional environment in which firms raise capital and evaluate strategic opportunities (Harford, 2005; Rhodes-Kropf & Viswanathan, 2004).

The practical relevance is equally clear. Corporate development teams and financial sponsors need to understand when the external environment is supportive of large-scale acquisitions. Investment banks rely on such signals when projecting deal flow and sectoral activity. Investors often read aggregate M&A as a confidence indicator. Policymakers may also care because M&A can act as a channel of capital reallocation, industry consolidation, and productivity-enhancing restructuring. For all these reasons, a compact empirical model of annual aggregate U.S. M&A activity remains useful even when it cannot capture every firm-specific or transaction-specific detail.

This paper focuses on five explanatory variables that represent distinct channels emphasized in the literature and in the presentation prepared for the KIRC research exhibition. CPI inflation captures price dynamics and valuation uncertainty. GDP growth captures the business cycle and expected earnings conditions. Tax revenue as a share of GDP is used as a macro-level indicator of fiscal and tax-related conditions. Foreign direct investment net inflows as a share of GDP reflects external investment climate and international capital engagement. Domestic credit provided by the financial sector as a share of GDP serves as a proxy for financing capacity and financial deepening.

The dependent variable is annual M&A Volume, defined as the total value of completed M&A transactions in the United States. A value-based measure is preferable to deal count in this study because it better captures the scale of capital reallocation and is more sensitive to valuation and financing conditions. A year with a few very large transactions may carry more macroeconomic meaning than a year with many small deals. Since the central goal is to evaluate how macroeconomic and policy conditions shape aggregate deal-making capacity, annual transaction value is the more relevant indicator.

The paper asks one broad question: which macroeconomic and policy factors are the most robust determinants of aggregate U.S. M&A activity? More specifically, it tests whether inflation, GDP growth, tax revenue, FDI, and domestic credit conditions are statistically associated with annual M&A value, and whether such associations remain reliable once the time-series properties of the variables are taken into account. This second point is critical. In annual macro-financial data, non-stationary variables can appear significant simply because they trend over time together, producing a spurious regression.

The sample period from 2000 to 2024 is especially suitable for this question because it spans several distinct macro-financial regimes: the post-dot-com slowdown, the pre-2008 credit boom, the global financial crisis, the post-crisis recovery, the pandemic shock, and the inflationary and monetary-tightening environment that followed. These episodes provide meaningful variation in growth, inflation, fiscal conditions, and financing variables. They also allow the study to examine whether the same explanatory variables remain relevant across very different macroeconomic environments.

The contribution of the paper is intentionally narrow but clear. It does not claim to provide a structural model of all determinants of M&A activity. Instead, it offers a parsimonious annual time-series framework designed to identify which of a small set of macroeconomic and policy variables remain robustly related to aggregate U.S. M&A activity after basic time-series diagnostics are applied. This makes the paper suitable for a conference format: it preserves the main empirical result presented in the slides while removing dissertation-level detail that is not essential for the conference version.

2. Literature Review and Hypotheses

The literature on mergers and acquisitions offers several complementary reasons to expect aggregate transaction activity to vary with the macroeconomic environment. At a broad level, M&A waves are a recurring empirical regularity. Andrade et al. (2001) and Holmström and Kaplan (2001) show that U.S. merger activity tends to cluster in periods that reflect broader changes in governance, corporate strategy, capital markets, and valuation conditions. Harford (2005) develops this point further by arguing that merger waves require not just a reallocation shock, but also sufficient capital liquidity. This argument makes financing conditions central to any macro explanation of aggregate M&A activity.

A second strand of the literature emphasizes valuation and market timing. Rhodes-Kropf and Viswanathan (2004) and Rhodes-Kropf, Robinson, and Viswanathan (2005) argue that merger waves are partly driven by periods in which valuations are elevated or acquirers are relatively overvalued. In such settings, firms may find it easier to use stock as acquisition currency, and transaction activity can intensify. Shleifer and Vishny (2003) similarly link acquisition behavior to stock-market conditions. These theories imply that aggregate M&A activity should be stronger when the macro-financial environment supports confidence, high valuations, and access to capital.

Macroeconomic conditions affect acquisitions not only through valuations but also through financing costs and uncertainty. Bernanke and Gertler (1995) argue that monetary conditions influence corporate behavior through both the price and the availability of external finance. Bloom (2009) adds that uncertainty can discourage irreversible investment because waiting becomes more valuable. Acquisitions fit this logic well: they are large, difficult to reverse, and often depend on external finance. Inflation may therefore reduce transaction appetite by raising uncertainty and discount rates, while better financing conditions should support deal activity.

The fiscal channel is particularly relevant for this paper. Auerbach and Reishus (1988) show that taxation can affect the merger decision through after-tax profitability and financing structure, while Graham (2000) highlights the value of debt tax shields in corporate finance. In principle, tax-related conditions can influence acquisitions through several mechanisms: expectations about after-tax cash flows, the attractiveness of debt-financed deals, the transfer of tax attributes, and the predictability of the broader fiscal environment. In practice, direct corporate-tax measures are not always available in a clean annual series, so aggregate studies sometimes rely on broader fiscal proxies.

The literature also suggests that foreign capital and credit conditions may matter, though not always in the same way. FDI is often interpreted as an indicator of investment climate and international confidence, yet it also includes retained earnings and greenfield investment, so its relationship with aggregate M&A can be weak or ambiguous. Domestic credit provided by the financial sector is a common proxy for financial depth and financing capacity, and the prior expectation is usually positive. However, credit variables often trend over time, creating a risk that level regressions may exaggerate their importance unless stationarity is examined explicitly.

Taken together, the literature leads to five directional expectations. Inflation is expected to have a negative effect because it increases valuation uncertainty and financing frictions. GDP growth is expected to have a positive effect as a business-cycle variable. TaxRev is expected to be positive under a broad fiscal-stability interpretation, even if its narrow tax-burden interpretation is less straightforward. FDI is expected to be positive but possibly weak. Domestic credit is expected to be positive because acquisitions become easier when financing is more available. These expectations are tested empirically in a compact annual framework that prioritizes robustness over model complexity.

3. Data and Methodology

The empirical analysis uses annual data for the United States from 2000 to 2024, yielding twenty-five observations. This small sample imposes important constraints on model design. First, the specification must remain parsimonious to avoid overfitting and preserve degrees of freedom. Second, annual time-series methods are more appropriate than heavily parameterized dynamic systems. Accordingly, the paper uses descriptive statistics, Pearson correlations, Augmented Dickey–Fuller unit root tests, and multiple regression with robust standard errors rather than VAR- or VECM-type frameworks.

The dependent variable, M&A Volume, is the total annual value of completed U.S. M&A transactions in logarithmic form. The explanatory variables are CPI inflation, GDP growth, TaxRev, FDI, and DCbyFS. The baseline level model is specified as: $M\&A_t = \beta_0 + \beta_1 CPI_t + \beta_2 GDP_t + \beta_3 TaxRev_t + \beta_4 FDI_t + \beta_5 DCbyFS_t + \varepsilon_t$. This baseline model corresponds directly to the conceptual hypotheses, but it is only valid for interpretation if the included variables are stationary or jointly form a credible long-run relationship.

Because the presentation emphasized that 'why stationarity matters' is one of the key messages of the paper, model selection is driven primarily by the ADF results. If a regressor is non-stationary in levels, keeping it in the baseline model may produce misleading significance. The preferred stationary model therefore becomes: $M\&A_t = \beta_0 + \beta_1 CPI_t + \beta_2 GDP_t + \beta_3 TaxRev_t + \beta_4 \Delta FDI_t + \beta_5 \Delta DCbyFS_t + \varepsilon_t$. In this specification, CPI, GDP, and TaxRev remain in levels because they are stationary in levels, while FDI and DCbyFS enter in first differences because the ADF tests show that they are non-stationary in levels.

The diagnostic strategy follows the same conservative logic. Correlation analysis and Variance Inflation Factors are used to assess multicollinearity. The Breusch–Pagan / Cook–Weisberg test checks for heteroskedasticity, and the Breusch–Godfrey LM test checks for serial correlation. Robust standard errors are retained in the reported regressions as a safeguard, but the main econometric issue turns out not to be multicollinearity or residual misspecification. It is the time-series behavior of the financial variables, especially domestic credit.

Table 1. Variables and expected relationships

Variable	Definition	Expected sign
M&A Volume	Log of annual total value of completed U.S. M&A transactions	Dependent
CPI	Annual inflation rate, %	Negative
GDP	Annual GDP growth rate, %	Positive
TaxRev	Tax revenue as % of GDP	Likely positive
FDI	Net FDI inflows as % of GDP	Positive, possibly weak
DCbyFS	Domestic credit provided by financial sector as % of GDP	Positive

Note. Compiled by the author based on the sample used in the thesis and Stata output.

4. Empirical Results

Table 1 reports descriptive statistics. The log of M&A Volume averages 13.2792 and ranges from 12.34 to 13.88, indicating substantial year-to-year variation in aggregate deal value. CPI averages 2.5764 percent, GDP growth averages 2.2096 percent, and TaxRev averages 10.5828 percent of GDP. FDI averages 1.7656 percent of GDP and includes a negative observation, while DCbyFS averages 231.4540 percent of GDP and displays a much stronger trend than the other variables. Even before formal testing, this pattern suggests that domestic credit may be problematic in level form.

The correlation matrix in Table 2 provides a useful preliminary picture. M&A Volume is positively correlated with CPI (0.3190), GDP (0.3260), TaxRev (0.6596), and DCbyFS (0.5050), and negatively correlated with FDI (-0.3190). The strongest simple association is therefore between M&A activity and TaxRev, followed by domestic credit. Correlations among the explanatory variables are generally modest, suggesting that multicollinearity is unlikely to be a major obstacle. Still, the strong positive correlation between M&A Volume and domestic credit could reflect shared trend behavior rather than a true structural link.

The ADF results in Table 3 are the turning point of the empirical analysis. CPI, GDP, and TaxRev are stationary in levels with p-values of 0.0297, 0.0163, and 0.0049, respectively. M&A Volume is weakly stationary at the 10 percent level with a p-value of 0.0692. By contrast, FDI has a p-value of 0.1142 and DCbyFS a p-value of 0.5114, so both fail to reject the unit-root null in levels. Once transformed into first differences, d_FDI and D_DCbyFS become clearly stationary, with p-values of 0.0000. This result justifies moving from the baseline level regression to the preferred stationary specification.

The baseline regression in Table 4 initially appears quite strong. It explains 63.65 percent of the variation in annual M&A activity (R-squared = 0.6365). TaxRev has a positive coefficient of 0.2282 and is highly significant ($p = 0.0001$). DCbyFS also appears positive and highly significant, with a coefficient of 0.0064 and $p = 0.0005$. CPI, GDP, and FDI are not statistically significant. If the analysis had stopped at this point, one could have concluded that both fiscal conditions and domestic credit conditions are robust drivers of annual U.S. M&A activity.

That conclusion, however, would have been premature. Once FDI and DCbyFS are transformed into stationary form, the preferred regression in Table 5 becomes more conservative but also more reliable. TaxRev remains positive and significant, with a coefficient of 0.2470 and $p = 0.0015$. CPI becomes effectively zero ($p = 0.9370$), GDP remains positive but insignificant ($p = 0.6082$), d_FDI is insignificant ($p = 0.9042$), and D_DCbyFS is also insignificant ($p = 0.2922$). The most important empirical result of the paper is therefore straightforward: TaxRev is the only variable that remains robustly significant after correcting for non-stationarity.

This shift between the level and preferred models is exactly the result highlighted in the presentation. Domestic credit looked important in the level regression, but the ADF test showed that DCbyFS was non-stationary in levels. After differencing, the significance disappeared. In practical terms, this implies that the apparent relationship between domestic credit depth and annual M&A value was likely capturing a common trend over time rather than a stable structural effect. The study therefore uses the stationary specification as the basis for interpretation, not because it produces stronger coefficients, but because it is econometrically more defensible.

The remaining diagnostics confirm that the model's main challenge is stationarity rather than classical residual problems. The mean VIF is only 1.3277 and the maximum individual VIF is 1.5962, so there is no meaningful multicollinearity concern. The Breusch–Pagan p-value is 0.7525, meaning heteroskedasticity is not detected. The Breusch–Godfrey p-value is 0.6735, meaning first-

order serial correlation is also not detected. These results make the story unusually clean for an applied conference paper: the level model is not undermined by collinearity or poor residual behavior; it is undermined mainly by the presence of non-stationary regressors.

Table 2. Descriptive statistics

Variable	N	Mean	Std. Dev.	Min	Max
MAVol	25	13.2792	0.4273	12.3400	13.8800
CPI	25	2.5764	1.6284	-0.3600	8.0000
GDP	25	2.2096	1.7648	-2.5800	6.0600
TaxRev	25	10.5828	1.1779	7.9000	12.9700
FDI	25	1.7656	0.8736	-0.6400	3.6200
DCbyFS	25	231.4540	25.4036	191.5900	296.8300

Note. Compiled by the author based on the sample used in the thesis and Stata output.

Table 3. Correlation matrix

	MAVol	CPI	GDP	TaxRev	FDI	DCbyFS
MAVol	1.0000	0.3190	0.3260	0.6596	-0.3190	0.5050
CPI	0.3190	1.0000	0.4134	0.5690	-0.0778	0.2043
GDP	0.3260	0.4134	1.0000	0.4115	-0.1307	0.0659
TaxRev	0.6596	0.5690	0.4115	1.0000	-0.1068	0.1860
FDI	-0.3190	-0.0778	-0.1307	-0.1068	1.0000	-0.2186
DCbyFS	0.5050	0.2043	0.0659	0.1860	-0.2186	1.0000

Note. Compiled by the author based on the sample used in the thesis and Stata output.

Table 4. Augmented Dickey–Fuller unit root tests

Variable	ADF statistic	p-value	Conclusion

MAVol	-2.7284	0.0692	Stationary at 10%
CPI	-3.0594	0.0297	Stationary
GDP	-3.2699	0.0163	Stationary
TaxRev	-3.6514	0.0049	Stationary
FDI	-2.5054	0.1142	Non-stationary
DCbyFS	-1.5446	0.5114	Non-stationary
d_FDI	-6.0950	0.0000	Stationary
D_DCbyFS	-5.1388	0.0000	Stationary

Note. Compiled by the author based on the sample used in the thesis and Stata output.

Table 5. Regression results: baseline levels vs. preferred stationary model

Variable	**Levels coef.**	**Levels p-value**	**Preferred coef.**	**Preferred p-value**
Constant	9.6016	0.0000	10.5977	0.0000
CPI	-0.0436	0.1342	0.0047	0.9370
GDP	0.0215	0.3841	0.0191	0.6082
TaxRev	0.2282	0.0001	0.2470	0.0015
FDI / d_FDI	-0.0833	0.3564	-0.0099	0.9042
DCbyFS / D_DCbyFS	0.0064	0.0005	0.0060	0.2922
R-squared	0.6365		0.4348	
Model p-value	0.0000		0.0049	

Note. Compiled by the author based on the sample used in the thesis and Stata output.

Table 6. Diagnostic tests for the baseline model

Test	Statistic	p-value / interpretation
Mean VIF	1.3277	Low multicollinearity
Maximum VIF	1.5962	Low multicollinearity
Breusch–Pagan	2.6585	p = 0.7525
Breusch–Godfrey	0.1776	p = 0.6735

Note. Compiled by the author based on the sample used in the thesis and Stata output.

5. Discussion and Implications

The conference version of the study deliberately centers on one substantive message and one methodological message. The substantive message is that tax-related fiscal conditions emerge as the most stable macroeconomic correlate of annual U.S. M&A activity in the sample. The methodological message is that plausible results in level data can still be misleading if the time-series properties of the regressors are ignored. The disappearance of the domestic-credit effect after differencing is therefore not a minor technical detail; it is one of the paper's main findings.

Why might TaxRev matter more consistently than the other variables? The answer depends on interpretation. TaxRev is not a direct statutory corporate tax rate, so the positive coefficient should not be read as evidence that higher taxation mechanically causes more acquisitions. A more defensible interpretation is that tax revenue as a share of GDP captures a broader fiscal and institutional environment. In a developed economy such as the United States, higher tax revenue may coincide with stronger nominal activity, higher profitability, a more stable fiscal base, and greater institutional predictability. Under that interpretation, stronger TaxRev years are also years in which firms may find it easier to finance and justify large transactions.

The non-significance of GDP growth in the preferred model may look surprising at first because business-cycle theory suggests that stronger growth should support acquisitions. Yet annual aggregate M&A value is heavily influenced by the timing of a relatively small number of large deals. This makes it less tightly tied to broad macro growth than a more granular sectoral or quarterly measure might be. GDP growth may still matter indirectly through valuations, executive confidence, and financing conditions, but in this compact annual specification it does not show a stable independent effect.

A similar interpretation applies to inflation. Theory implies that inflation can reduce acquisition activity by increasing uncertainty and discount rates. However, CPI inflation may be too broad a measure to capture the uncertainty channel precisely, especially in a sample that includes both crisis periods and recoveries. In some years inflation may coincide with stronger nominal revenue growth, partially offsetting its negative theoretical effect. The empirical result therefore does not show that inflation is irrelevant. It shows only that CPI by itself does not robustly explain aggregate annual U.S. M&A value once the preferred specification is used.

The weak results for FDI also deserve attention. FDI is a broad capital-flow measure that includes more than acquisitions: retained earnings, greenfield investment, and other long-term commitments are all part of it. For that reason, it is not surprising that annual changes in FDI fail to map cleanly onto aggregate M&A transaction value. The same logic reinforces an important theme of the paper: macro variables that look theoretically relevant may still be empirically weak if the available proxies are too broad relative to the underlying economic mechanism.

From a policy and market perspective, the results imply that analysts should be careful when reading simple time-series relationships in M&A data. Trend-like financial indicators may appear to explain deal-making when in reality they are only moving alongside it. More broadly, the paper suggests that the overall fiscal environment may matter more consistently for aggregate U.S. M&A activity than the other macroeconomic indicators included in this model. This is not a complete theory of the U.S. M&A market, but it is a useful result for a conference paper because it is both empirically grounded and methodologically transparent.

6. Conclusion

This paper examined whether selected macroeconomic and policy variables help explain annual M&A activity in the United States during 2000–2024. Using annual time-series data, it tested the effects of inflation, GDP growth, tax revenue as a share of GDP, FDI net inflows, and domestic credit provided by the financial sector on the annual total value of completed U.S. M&A transactions.

The empirical analysis produced a clear result. In the baseline level regression, both TaxRev and DCbyFS appeared positive and statistically significant. However, ADF testing showed that FDI and domestic credit were non-stationary in levels. After transforming those variables into first differences, only TaxRev remained positive and statistically significant. CPI, GDP growth, changes in FDI, and changes in domestic credit did not display robust significance in the preferred specification.

The paper therefore arrives at two conclusions. First, within this compact annual framework, tax-related fiscal conditions are the most robust macroeconomic correlate of aggregate U.S. M&A activity. Second, time-series diagnostics matter substantially: without stationarity testing, the paper would have overstated the role of domestic credit conditions. The key takeaway for the conference is thus both substantive and methodological. Fiscal conditions appear more consistently related to annual U.S. deal activity than the other tested variables, and careful treatment of non-stationary regressors is essential for credible inference in small-sample macro-financial research.

Future work could extend this analysis using quarterly data, sector-level panels, or more targeted variables such as corporate tax reforms, policy rates, credit spreads, valuation indicators, or uncertainty indices. Even so, the current paper already provides a useful conference contribution by showing how a compact and carefully specified time-series model can clarify which variables remain meaningful once basic econometric pitfalls are addressed.

6.1 Why the TaxRev result matters

The result also matters because it helps connect M&A research with a wider discussion about macro-financial conditions. Much of the applied M&A literature focuses on firm-level motives, strategic fit, or post-merger performance. This paper shows that even in a small annual sample, the

broader fiscal environment can still show up in aggregate deal value. That does not eliminate the importance of valuation, governance, or industry-level factors, but it does suggest that aggregate acquisition activity may be more deeply embedded in the institutional macro environment than a purely firm-level reading would imply.

This result should still be interpreted carefully. The paper does not claim that higher taxation directly causes more acquisitions. A more convincing reading is that tax revenue as a share of GDP reflects a broader fiscal and institutional environment. In a mature economy such as the United States, stronger tax revenue may coincide with healthier nominal activity, stronger profits, better public-finance conditions, and a policy environment in which large firms are more willing to commit capital to acquisitions. Under that interpretation, TaxRev functions as a reduced-form indicator of macro-fiscal strength rather than as a narrow tax-rate lever.

The positive and robust coefficient on TaxRev is important because it survives the main econometric correction in the paper. In the baseline model, both TaxRev and domestic credit appear significant. After the non-stationary variables are transformed, only TaxRev remains significant. This means that the TaxRev result is not simply an artifact of shared trends. Instead, it is the only association in the model that remains stable once the specification is made more conservative. For a conference audience, this is the clearest empirical takeaway: fiscal conditions are not just statistically significant in one convenient model; they are the only variable that remains significant in the preferred specification.

7. Limitations and Directions for Future Research

Future research could proceed in several directions. One extension would be to move to quarterly data and examine whether short-run macro-financial shocks matter more than annual averages suggest. A second extension would be to estimate an industry-level panel to test whether macroeconomic conditions affect technology, healthcare, industrial, or financial-sector acquisitions differently. A third extension would be to combine macro variables with valuation indicators and uncertainty measures to test whether fiscal conditions remain dominant once stock-market conditions are modeled more explicitly. These avenues would allow researchers to move from the compact conference model presented here toward a richer explanation of merger waves in the United States.

The third limitation concerns measurement. TaxRev is a broad fiscal indicator rather than a direct statutory corporate tax rate. FDI is broader than cross-border acquisitions because it also includes retained earnings and greenfield investment. Domestic credit is a broad financial-depth measure rather than a direct cost-of-acquisition-financing variable. These proxies are still economically meaningful, but future work could sharpen the channels by using targeted variables such as merger financing spreads, corporate tax reform dummies, industry-specific M&A value, or separate domestic and cross-border deal series.

The second limitation concerns variable choice. The paper intentionally keeps only the variables highlighted in the conference presentation, but aggregate M&A activity may also depend on policy rates, stock-market valuations, uncertainty indices such as the VIX, credit spreads, or regulatory and antitrust developments. Excluding those variables does not invalidate the results; it simply means that the reported coefficients should be interpreted as reduced-form associations within a compact specification rather than as the full set of determinants of U.S. M&A activity.

The first limitation of the paper is the small annual sample. Twenty-five observations are enough to estimate a compact model, but they are not enough to support richer dynamic

specifications, multiple lag structures, or a formal treatment of structural breaks. This limitation should not be ignored because aggregate M&A value is a lumpy variable: a few very large transactions can materially shift the annual total. In a larger dataset - especially one based on quarterly observations—moderate macroeconomic effects might become easier to detect, and the relative importance of growth, inflation, and financing variables could look different.

Hypothesis	Expected sign	Preferred-model result	Decision
H1: CPI	Negative	Coefficient near zero; p = 0.9370	Not supported
H2: GDP	Positive	Positive but insignificant; p = 0.6082	Not supported
H3: TaxRev	Positive	Positive and significant; p = 0.0015	Supported
H4: d_FDI	Positive	Negative and insignificant; p = 0.9042	Not supported
H5: D_DCbyFS	Positive	Positive but insignificant; p = 0.2922	Not supported

Note. The preferred model is used for final hypothesis evaluation because it respects the stationarity properties of the data.

Table 7. Hypothesis evaluation

Table 7 summarizes the hypothesis evaluation. The table makes the logic of the conference paper transparent. Some relationships looked supportive in theory, and one additional variable - domestic credit—also looked supportive in the baseline level model. Yet after the preferred model is estimated, only the tax-related fiscal variable remains robust. This is why the conference version emphasizes both substantive interpretation and econometric discipline. The point is not that other variables never matter, but that this dataset and specification do not identify them as stable independent determinants once non-stationarity is addressed.

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Continuity and Change in Uzbekistan's National Role Conceptions: Foreign Policy under Mirziyoyev (2016–2025)

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EXTENDED ABSTRACT

Uzbekistan's 2016 leadership transition from Islam Karimov to Shavkat Mirziyoyev marked one of the most notorious shifts in foreign policy in post-Soviet Central Asia. On the one hand, Karimov's foreign policy was marked by its unpredictability and it was largely driven by security concerns. "Geopolitical pendulum" (Kobilov, 2024), "Elastic foreign policy" (Pikalov, 2014) and "Defensive self-reliance" (Fazendeiro, 2017) were some of the concepts used by scholars to explain such a volatile foreign policy.

On the other hand, since the leadership transition in 2016, Uzbekistan's foreign policy has undergone a noticeable shift. Karimov's successor, Mirziyoyev, has demonstrated strong pragmatism in Uzbekistan's relations with the international community, motivated by the potential to improve the national self-image to attract foreign investment (Dadabaev, 2019). A pronounced positive engagement with regional cooperation has been another notable departure from his predecessor (Kobilov, 2025).

However, despite the significance of this turning point in Uzbekistan's foreign policy, the existing literature remains largely focused on Karimov's era. Additionally, such an imbalance is also marked by the underuse of conceptual tools that would theoretically explain the changes in foreign policy derived from the leadership transition in Uzbekistan (Madaminova, 2025).

Hence, this research aims to fill this gap by adding a new theoretical layer to understand this transition in foreign policy. This study is guided by the central research question: to what extent is the shift in Uzbekistan's foreign policy from Islam Karimov to Shavkat Mirziyoyev reflected in changes in their National Role Conceptions?

As evidenced, the concept of National Role Conception (NRC) will be central to this analysis and they are situated within the broader scope of Role Theory, which will serve as the overarching theoretical framework of this study. Role Theory was originally developed in Sociology and was later adapted for Foreign Policy Analysis by Holsti (1970) to understand the motivations behind the logic of states' interaction in the international context. A remarkable contribution of the theoretical work initiated by Holsti is shedding light on the dimension of the decision-maker's perceptions when explaining the state's behavior in foreign policy.

In this context, NRCs are understood in this analysis as "foreign policy makers' perceptions of their nations' positions in the international system" (Wish, 1980, p.533). They shape foreign policy decision-making and, consequently, how states behave in the international system.

Grossman (2005) also points out that changes in NRCs are also correlated with changes in foreign policy. In this sense, naturally, as this research is guided by understanding the variances in NRC between Karimov and Mirziyoyev, Role Change is another paramount concept for this analysis. A widely accepted definition in Role Theory literature describes it as "as a change in the

shared conception and execution of typical role performance and role boundaries" (Turner, 1990, p. 88).

Methodologically, the work of Wish (1980) is particularly relevant, as one of the pioneers in developing a systematic categorization of NRCs, which served as the methodological reference for this study's content analysis. In this logic, coding is based on Wish's three main variables: Status[10], Motivational Orientation[11] and Issue Area[12].

Coding is implemented in the NVivo Software and is conducted abductively, combining theory-driven initial codes that are adapted and expanded at an early coding stage as new patterns are identified as coding progresses. As this process relies on a single coder, a codebook is developed to ensure the coding process's reliability and transparency.

The corpus for the analysis consisted of 142 speeches by Mirziyoyev[13], both domestically and internationally, covering the period 2016 – 2025, the year this study was initiated. The speeches were published on Uzbekistan's official presidential website and cover the president's main addresses throughout his terms.

Content analysis was chosen as the primary method due to its wide acceptance as a reliable means of gathering data for interpreting NRCs and its predominance among Role Theory scholars (Breuning, 2023). Although the analysis was mainly qualitative, as signaled by Lamont (2022, p. 109), content analysis can be said to be "neither purely quantitative nor qualitative", as it inevitably involves the counting of patterns and frequencies to complement interpretation.

The preliminary findings from this analysis point to an adaptation of Karimov's NRCs rather than a radical shift in Mirziyoyev's discourse. This can be inferred from the pattern found across the variables: the predominant categories in each variable continue to be the same from Karimov – Uzbekistan being portrayed as an equal partner (Status), predominantly cooperative in relation to others in the international arena (Motivational Orientation) and mainly focused on the economic dimension (Issue Area).

However, that is not to say that there was complete continuity from Karimov. The growth of the Political/Diplomatic spheres in Mirziyoyev's discourse, for instance, and the accentuated decrease in Territorial Defense show a sharp contrast to Karimov's discursive thematic areas. This contrast reveals a broader transition from a security-centered to a diplomacy-centered model of foreign policy practice.

Another example is that cooperation is far more prevalent in Mirziyoyev's discourse, suggesting a less conditional approach to international cooperation with other actors. Cooperation is also present across all influence domains (domestically, bilaterally, regionally, organizationally, and globally). The latter shows a clear contrast with Karimov, whose discourse indicated a lower degree of cooperation, particularly in the organizational domain, which can be explained by the skepticism toward multilateral settings, perceived as "instruments of Russian dominance" (Bauyrzhankyzy, 2025, p. 100).

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[10] Status is "correlated with legitimate power and social esteem" (Sarbin and Allen, 1968, as cited in Wish, 1980, p 536). In the present study, Status is measured by three indicators: Influence Domain, Degree of Influence and Evolution of Influence.

[11] Motivational Orientation captures the underlying goals the decision maker seeks to achieve with foreign policy. This variable encompasses two indicators: Orientation Towards Others and Orientation Towards System Change.

[12] Comprises the main thematic domain in which the decision-maker perceives their state's position and/or responsibility in the international system.

[13] Although this analysis focuses on the variance between Karimov and Mirziyoyev NRCs, primary data is collected only for the latter, as the present study will benefit from Karimov's NRCs data collected previously by the other authors (Fazendeiro, 2018; Bauyrzhankyzy 2025).

These preliminary findings suggest an NRC adaptation from "Self-reliant" (Fazendeiro, 2013) or "Independent Actor" (Bauyrzhankyzy, 2025), possibly to "Active Independent". The latter was defined as the refusal of any "permanent military or ideological commitments, (…) suggesting active efforts to cultivate relations with as many states as possible. (It emphasizes) active programs to extend diplomatic and commercial relations to diverse areas of the world." (Holsti, 1970, p. 262).

Additionally, the preliminary findings of this study are grounded in the present literature. Theoretically, these conclusions support the argument in Role Theory that NRCs are typically adjusted gradually rather than abruptly abandoned (Chafetz et al., 1996). On the same note, the changes observed between Karimov's and Mirziyoyev's NRCs are also backed by existing literature as a process of role adaptation, which represents the first degree of role change described by Harnisch et al. (2011). This initial level of change denotes a persistence in the goals that guide foreign policy (in this case, emphasis on economic development, assertion of their own sovereignty and international cooperation), while adapting the strategies through which these goals are pursued (e.g., the use of political and diplomatic tools over insistence on defense matters).

Empirically, the findings also confirm earlier suggestions in the literature. Bauyrzhankyzy (2025), for instance, when analyzing Karimov's NRCs, tentatively suggested that Mirziyoyev's foreign policy developments could reflect a process of role adaptation rather than a radical transformation from Karimov. However, the author did not conduct any systematic primary data analysis to support this assumption, as it did not align with her research focus. This study addresses this gap and substantiates these claims through a structured examination of presidential discourse.

In this line, this analysis brings forth two main contributions. Firstly, it inaugurates the conceptual application of Role Theory as a theoretical tool in FPA to analyze and understand Mirziyoyev's foreign policy, which has thus far been limited to the Karimov Era. Secondly, it also adds to expanding the application of Role Theory in Central Asia, as its use in the region has remained limited since its original formulation[14].

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Gender Inequality in Access to Higher Education in Kazakhstan: Cultural, Economic and Institutional Barriers

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Abstract

This article explores how cultural, economic, and institutional barriers influence women's access to higher education in Kazakhstan. It assumes that high female participation rates and formally open admissions procedures do not guarantee equal opportunities. It focuses on understanding access as a multi-stage process, encompassing aspiration formation, preparation, application, admission, enrollment, and early academic persistence. The study is conducted within an interpretivist qualitative paradigm using a case study. The empirical base consists of semi-structured interviews with 15 participants, including female STEM students, male students, faculty, parents, and NGO experts. The data are analyzed using thematic analysis. The results demonstrate that gender inequality manifests itself not through the direct exclusion of women, but as a cumulative process: cultural norms limit permissible pathways already at the stage of educational expectations, and then financial constraints, regional and linguistic differences, unequal access to information, and institutional practices, formally neutral, in fact favor those with more resources. The article also emphasizes that women are a heterogeneous group, and the nature of barriers varies by region, social status, language, and field of study. This study's primary contribution is to demonstrate that access to higher education extends not only to the moment of admission, rather encompassing a socially differentiated process influenced by intersecting barriers encountered at various stages. Its novelty lies in integrating an interpretivist case study of Kazakhstan with a multi-actor approach that incorporates perspectives from students, families, faculty, and civil society. This combination reveals how educational systems, while formally gender-neutral, may nonetheless follow unequal trajectories in practice. The main conclusion is that real equality requires not only formal access but also a reconsideration of the conditions that shape women's educational paths in Kazakhstan.

Key words: gender inequality, higher education, Kazakhstan, access to education, cultural barriers, economic barriers, institutional barriers, educational trajectories

1. Introduction

The collapse of the Soviet Union had a profound impact on contemporary access to higher education in Kazakhstan, particularly for women (Ahn, 2018; OECD & World Bank, 2007). The Soviet era was marked by significant changes in the economy, institutions, and principles of public administration. The late 1990s and early 2000s were very difficult for the population, marked by financial instability and reforms in the educational system (Amagoh, 2012; Yakavets, 2014). Under these circumstances, higher education became both a means of social mobility and a very expensive investment in the future, requiring families to think strategically about the current situation. Thus, a new environment emerged in which women's access to education depended not only on eligibility but also on family financial resources, social frameworks, expectations, and institutional conditions (Ghodsee, 2019).

Since independence, the country has undergone significant changes in the education sector. Specifically, there has been an increase in the number of private universities, the introduction of tuition fees alongside state grants, and the implementation of a Unified National Testing System for university admission. Furthermore, higher education is gradually being reformed based on the Bologna model, accompanied by changes in governance and financing (Government of the Republic of Kazakhstan, n.d.; OECD and World Bank, 2007). Economic pressures have significantly altered the importance of access to education for the population, as well as the underlying problems. Institutional changes have had a profound impact on university funding options, the distribution of quality and funding for education between regions and cities, and mechanisms for accessing selective programs have also changed. Concurrently, gender expectations have shifted in society, influencing the prioritization of values. This, in turn, has influenced the formation of acceptable educational trajectories. As a result, barriers to education have evolved not as isolated obstacles but as a cumulative set of constraints, which in turn influence educational choice, admission, and early academic sustainability (Ozawa, 2024).

This study examines access to higher education in Kazakhstan through a lens that integrates cultural, economic, and emotional barriers. Access to education is examined not as a matter of admission, but as the entire journey women take through developing educational goals, preparing, applying, applying, enrolling, and early academic success. This approach demonstrates that the official openness of the system does not translate into real equality of opportunity. True access to education depends on whether women have sufficient resources and social and institutional support to not only choose higher education but also to navigate this journey and complete it in practice (Sen, 1999).

Although statistics indicate a relatively high percentage of women in higher education, this does not indicate the absence of inequality. Even with high completion rates, huge disparities in access to selective programs, prestigious universities, and high-income fields of study persist. According to official statistics, at the beginning of the 2024-2025 academic year, approximately 624,500 students were enrolled in higher education in Kazakhstan, 53% of whom were women. However, despite this high percentage, these statistics do not indicate equality in conditions and access to the most rewarding educational pathways (Bureau of National Statistics, 2024).

In modern Kazakhstan, the higher education system itself creates additional complexity. The country has both private and public universities, as well as a system of competitive state grants and fee-based tuition for those who don't receive them (Bureau of National Statistics 2024; Government of the Republic of Kazakhstan, n.d.). Families must therefore evaluate not only the likelihood of admission but also the cost of tuition, preparation, and relocation and accommodation. The concentration of top universities in large cities exacerbates regional inequality, and the linguistic dimension of access, depending on the language of instruction (Kazakh, Russian, or English), becomes an additional barrier. In such circumstances, gender inequality manifests itself in the uneven distribution of resources, information, and opportunities for choice (UNESCO, 2024).

Based on all the information available, this study is based on the following argument: although women in Kazakhstan formally have access to higher education, in reality this access does not reflect equality, as cultural expectations, economic constraints, and institutional mechanisms operate not separately but interrelatedly. Therefore, the primary objective of the study is not to confirm and document the level of women's participation in higher education, but to analyze how various factors and barriers influence educational decisions and limit choice within the higher education system (Kataeva, 2025).

2. Literature Review / Theoretical Framework

2.1. Historical and Structural Context

Research on gender inequality in education in Kazakhstan is impossible without considering and analyzing the historical and political-economic context. Historically, the Soviet legacy left behind a formally high level of female participation in education and paid employment (Kamp, 2016). However, this was not accompanied by the elimination of underlying stratification. Consequently, the high level of female participation in higher education cannot be seen as evidence of achieved equality; on the contrary, it may conceal the persistent persistence of unequal trajectories within the system (Ghodsee, 2019).

After independence in 1991, Kazakhstan's higher education system began to develop under entirely new conditions: market reforms, a redistribution of financial responsibility, and growing functional differentiation (OECD & World Bank, 2007). Higher education began to be built on mixed funding models, a rapidly growing fee-paying sector, and a new system of competitive grant distribution (OECD, 2017). Politically, this represented a transfer of some risk from the state to private providers (OECD & World Bank, 2007). Furthermore, under these new conditions, access to education began to depend not only on academic achievement but also on family solvency, successful preparation, access to information, and the ability to afford travel and living expenses in large cities (World Bank, 2023).

This is of paramount importance in research on gender inequality, as decisions about educational investments in favor of daughters depend not only on their academic potential but also on cultural expectations. Thus, the new higher education system in contemporary Kazakhstan has increased dependence on family resources and social norms (Ozawa, 2024).

2.2 Theoretical approaches to explaining inequality

An analysis of the theoretical literature revealed several explanations for inequality in access to higher education. According to human capital theory, education is an investment, and the decision to enroll reflects an assessment of expected future benefits in relation to costs and risks (Becker, 1964). This approach is useful for understanding how families make educational decisions in conditions of rising private costs, uncertain labor market returns, and competition for state educational grants (Becker, 1964; OECD, 2017). However, in the context of Kazakhstan, this approach is inappropriate because, in reality, educational decisions depend on family negotiations, social norms, and unequal access to information (World Bank, 2023).

Social reproduction theory and the concept of cultural capital describe how inequality arises even in settings without direct discrimination. Access to prestigious universities depends not only on exam results but also on access to information, confidence, and familiarity with academic expectations (Bourdieu, 1986). This is because educational institutions often reward not only academic achievement but also specialized skills, language proficiency, and the ability to navigate the institutional environment. In the context of gender inequality, this is due to the fact that cultural norms and perceptions influence the choice of majors, subjects, level of ambition, and sense of confidence in particular educational paths.

In the context of Kazakhstan, it is particularly important to understand that gendered notions of professions and social roles are created at the school level. This narrows the scope for choice even before admission (Durrani et al., 2022).

Stratification theory describes how, in a widespread higher education system, gender inequality manifests itself not in admissions itself, but in the specific universities and programs that different groups of students are admitted to based on gender. This problem is particularly relevant

for Kazakhstan, where the system is differentiated by the prestige of higher education institutions, the language of instruction, and geographic location. Despite the overall high representation of women in higher education, within the system itself, they may be underrepresented in the most resource-rich universities and high-income programs. Therefore, statistics often conceal the inherent stratification of opportunity (Boliver, 2017).

In turn, institutional theory and its approach to gender-marked organizations explain why formally independent rules do not always lead to actual equality. Higher education institutions are not neutral spaces; they have become part of a hierarchy, where procedures and organized cultures can create inequalities in the distribution of resources, support, mentoring, and promotion success (Acker, 1990). Recent literature shows that, in the context of Kazakhstan, the advancement of the gender equality agenda depends on how it is interpreted by institutional leaders (Kataeva, 2025). Furthermore, vertical divisions and leadership gaps exist within the education and research system, meaning that a large number of women at the entry-level does not always lead to equality at higher levels of the academic hierarchy (Nurgaliyeva, 2025).

2.3. Cultural, economic and institutional mechanisms

Within the integrated research model, cultural barriers are considered the first filters that influence educational goals, choice of training fields, mobility, and sense of security. Gender norms often bias women toward "socially acceptable" professions, such as education, healthcare, or social sciences, while limiting their interest in engineering, ICT, and other traditionally male-dominated fields. Furthermore, family expectations and security concerns can narrow geographic choices and reduce the likelihood of relocating to another city. Thus, cultural mechanisms begin to operate even before applications are submitted, shaping not only choices but also perceptions of actual development opportunities (UN Women Regional Office for Europe and Central Asia, 2024).

Economic barriers act as mechanisms that limit access at the secondary level. This applies not only to the cost of tuition but also to additional expenses, such as exam preparation, tutoring, transportation, rent, food, and course materials. The influence of private tutoring is particularly noticeable, as it transforms family financial resources into a real educational advantage in a formally meritocratic system. In Kazakhstan, this has been well demonstrated in recent research on private tutoring and inequality in access to higher education (Baikenov & Hajar, 2025). For women, economic difficulties can be exacerbated when families perceive their education to be less beneficial or are unwilling to invest in expensive and distant educational programs.

Institutional barriers impact the entire educational process. They include admissions policies, language requirements, the quality of preparatory courses, the organization of student support, housing allocation, the availability of transportation and amenities, as well as the transparency of procedures and the availability of information. Institutional mechanisms are especially important during the first year of study, when the risk of dropping out is highest. During this period, the presence or absence of academic, psychological, and organizational support can significantly impact whether a student perceives their studies as a realistic and sustainable option (UNICEF Kazakhstan, 2023).

The digitalization of educational services plays a special role. On the one hand, digital portals can simplify the admissions process and make it more transparent. On the other hand, they can perpetuate existing inequalities if their design fails to take into account differences in internet access, digital literacy, language preferences, and user support. For Kazakhstan, this is especially important given the growing role of digital government services and the persistent digital divide (International Telecommunication Union, 2024).

2.4. Analytical perspective of the study

The main finding of the literature review is that no single approach provides a complete explanation for how gender inequality in access to higher education is formed in Kazakhstan. This article proposes an integrated analytical approach that considers cultural, economic, and institutional factors as interrelated elements of a single process. This process is rooted in the post-Soviet structural context, including market reforms, differences between universities, regional inequalities, and changes in the role of the state (World Bank, 2023).

Furthermore, the framework takes into account an understanding of access as an ongoing process rather than a one-time event. This means that gender inequality can emerge at different stages: during the formation of educational aspirations, preparation, application, admission, enrollment, and early adaptation. This approach emphasizes the importance of intersectional analysis, as the category of "women" is not homogeneous, and the impact of barriers depends on region, socioeconomic status, language of instruction, and other factors (Crenshaw, 1989). Thus, gender inequality in access to universities in Kazakhstan is viewed not as an isolated incident, but as a complex and multi-layered process.

3. Methodology

3.1. Research Design

This study is conducted within an interpretivist qualitative paradigm and utilizes a qualitative case study design focusing on the higher education system in Kazakhstan. This approach was chosen because the study's goal goes beyond measuring aggregate participation rates to understand how different participants in the educational environment perceive, interpret, and experience barriers (Creswell & Poth, 2018).

Kazakhstan represents an analytically important case study because it combines relatively high levels of female participation in education with pronounced institutional stratification, persistent gender expectations, post-Soviet political and economic changes, and ongoing educational reforms. The focus is on women's access to higher education, which is viewed as a cumulative process from aspiration formation and preparation to admission, institutional placement, and initial academic persistence (Yin, 2018).

3.2 Sample and participants

The study utilized purposive participant selection with subsequent snowball sampling. This method was chosen because the research questions required individuals with direct experience or relevant perspectives on the issue of gender inequality in access to higher education in Kazakhstan. The study included five groups: female STEM students, male students, faculty and lecturers, parents of college-aged daughters, as well as policy experts and representatives of NGOs working at the intersection of gender and education.

Particular attention was paid to female STEM students, as gender stereotypes, perceptions of their inappropriateness and questions of belonging are particularly pronounced in these fields. The IRB protocol initially planned for approximately 20-25 interviews, but only 15 were actually conducted. Although the number of interviews was reduced, the multi-group structure of participants remained the same. The sample is not intended to be statistically representative but is consistent with the goals of qualitative research aimed at in-depth understanding and thematic richness (Guest et al., 2006).

3.3 Data collection

The primary data collection method was semi-structured interviews, lasting approximately 30-40 minutes. They were conducted in person or online via Zoom and Microsoft Teams, depending on the convenience and capabilities of the participants. This format allowed for a common theme to be compared between interviews while still allowing participants to elaborate on their decisions, experiences, and perspectives.

Separate interview guides were developed for each category of respondents, tailored to their role but generally focused on a single research question. Each interview addressed similar themes: gender norms and expectations, economic constraints and family decisions, institutional rules and forms of support, access to information and digital services, and the interplay of various barriers to education.

3.4 Data analysis

The data were analyzed using thematic analysis based on Braun and Clarke's method. This approach helped identify recurring themes in the interviews while maintaining the interpretive flexibility needed to connect empirical narratives to the research's theoretical framework (Braun & Clarke, 2006; Braun & Clarke, 2019).

The analysis proceeded in several stages. First, transcripts and notes were carefully reviewed, then initial codes were developed related to cultural norms, economic constraints, institutional practices, access to digital resources, and political issues. These codes were then combined into broader themes. Coding was partly inductive and partly based on the theoretical framework. A key step was comparing themes across different participant groups, which helped distinguish between immediate barriers, observed institutional practices, and broader interpretations of the persistence of gender inequality.

3.5. Research integrity and ethics

To enhance reliability, the procedures were guided by Lincoln and Guba's criteria of trustworthiness: credibility, transferability, reliability, and confirmability (Lincoln and Guba, 1985). Trustworthiness was maintained through the use of interview guides, questions related to the research topic, systematic coding, and discussion of participants' multiple perspectives.

Before commencing the Polish phase, the study received institutional ethics committee approval. All participants were of legal age and provided informed consent. Confidentiality was ensured by coding participants, removing identifying information from transcripts, and restricting access to study materials. The risk to participants was assessed as low; however, issues of voluntary participation, safety, and anonymity were considered crucial at all stages of the study.

4. Findings

The analysis of interviews reveals that formally making higher education accessible to women in Kazakhstan is not a sufficient condition for equal access. Instead, admission opportunities are shaped by a complex interplay of cultural, economic, regional, institutional, and technological factors that manifest themselves at various stages of the educational journey and mutually reinforce each other. Although universities are formally accessible to all applicants, actual opportunities to enroll in prestigious and stable educational programs are unevenly distributed. The results indicate that gender inequality should not be viewed as direct discrimination, but rather as a cumulative process in which expectations, resources, institutional mechanisms, and adaptive factors gradually shape women's choices and opportunities.

4.1. Formal Openness Masks Uneven Access

The first key finding is that the formal openness of the higher education system in Kazakhstan does not ensure real equality of opportunity. Respondents did not characterize the system as overtly discriminatory based on gender. Official rules and procedures appear to make access to education gender-neutral. However, interviews demonstrate that this formal openness conceals significant inequalities in access to various types of opportunities.

This inequality manifests itself more in differences in chances of gaining admission to prestigious universities, competitive programs, and sought-after fields than in the actual admissions process itself. In practice, some applicants receive greater informational, emotional, and material support. One expert noted, "On paper, everything appears open, but the reality shows that opportunities to take advantage of this vary. Some have more support, information, and confidence from the start" (E-1). Thus, a high proportion of women in the system does not automatically indicate equality.

4.2. Gender expectations shape aspirations and narrow choices before admission

The second conclusion is that inequalities begin long before university admission. Interviews revealed that school socialization, family expectations, and cultural norms shape girls' ambitions, their confidence, and their perceptions of suitable educational paths. Therefore, access should not be viewed as a single entry point, but as a process that begins with the formation of ambitions.

Participants noted that they are rarely directly told that higher education is unavailable to them. Instead, they are more often directed toward certain socially acceptable options and diverted from others. Support for education is present, but not in all forms. In particular, technical and STEM fields are viewed as more acceptable when chosen by women. One student explained this dynamic: "No one stopped me from going into this field, but from childhood, there was an understanding that certain fields are considered more suitable and safe for girls" (STEM-1).

This suggests that cultural norms operate through limiting acceptable options rather than through outright prohibitions. Respondents described symbolic boundaries related to field choice, prestige, geographic location, and career expectations. As one noted, a man in a technical field is perceived as normal, while a woman with the same choice attracts additional attention (MS-1). Consequently, these expectations influence ambitions and self-esteem long before the application stage.

4.3. Access is stratified by resources, region, language, and institutional support

The third finding concerns that access to higher education is significantly determined by material resources and the institutional environment. Despite formal competitive selection, interviews indicate that successful admission and continuation of studies largely depend on financial means, regional affiliation, language proficiency, access to information, and the ability to navigate institutional procedures.

Financial constraints are particularly significant. Participants emphasized that access is determined not only by tuition but also by the entire range of expenses: tutoring, transportation, accommodation, meals, course materials, and daily living costs. One mother noted that the choice of university is largely determined by overall accessibility, not just academic achievement: "When applying, they consider not just university requirements, but also housing, food, and other expenses. Ultimately, accessibility turns out to be more limited than it seems" (P-1). Such pressures can have a particularly strong impact on women due to gender stereotypes that determine priorities for investment in education.

Regional and linguistic differences exacerbate these barriers. Girls from rural areas and small towns often face additional challenges related to relocation, adaptation, and family supervision related to issues of safety and mobility. These barriers extend beyond logistics and are rooted in cultural expectations regarding independence and mobility. One respondent characterized this complex as a combination of challenges related to living alone, social integration, and language insecurity (STEM-2). Thus, access is determined not only by selection criteria but also by uneven conditions for preparation and continued education.

Institutional factors are also important during the educational stage. Respondents cited uneven access to information, varying quality of preparation, complex procedures, difficulties with adaptation, and limited support during the transition to university. These barriers are formally neutral, but they favor students with existing knowledge, support, and confidence in interacting with educational institutions. A teacher explained, "The procedures are formally the same, but students who don't have someone nearby to explain the details find it more difficult to navigate" (FL-1). Therefore, admission is not the final stage of access—the first academic year requires adaptation and support.

In the interviews, digital technologies were viewed as a dual factor. Online platforms can simplify procedures and reduce reliance on intermediaries, but they also require digital literacy, internet access, and confidence in using official systems. For some students, this empowers them, while for others, it creates additional stress, especially in regional and linguistic contexts.

4.4. Women's experiences are heterogeneous, and inequality accumulates across the educational trajectory

The fourth and most fundamental finding is that women are not a homogeneous group, and inequalities accumulate at all stages of the educational process. The interviews document variations in the significance and intensity of barriers depending on family resources, region of residence, language of instruction, chosen major, type of educational institution, and family environment. For some, the main obstacle is financial problems, while for others, it's family expectations, limited mobility, a lack of a sense of belonging, or a lack of institutional support. As one faculty member noted, even within a single university, some students are confident and receive support, while others are forced to constantly compensate for gaps despite formal equality of conditions (FL-2).

This heterogeneity is analytically significant because it demonstrates the limitations of using general statistical indicators of engagement to assess equality. Uniform formal standards do not produce the same results across students with different combinations of resources and constraints. Interdisciplinary analysis helps understand how gender interacts with region, social status, language, and institutional characteristics to shape educational trajectories.

Overall, the results highlight the need to view access to higher education as a sequential, multi-component process, spanning stages from the formation of ambitions to admission, retention, and early academic activity. One student characterized this process not as overcoming a single major barrier, but rather as the accumulation of numerous smaller obstacles that influence choice and confidence (STEM-4). Thus, the data support the view of gender inequality in access to education in Kazakhstan as a cumulative process, reproduced through the interaction of cultural norms, resource inequalities, and institutional mechanisms.

5. Discussion

The results of this study confirm the key thesis that gender inequality in access to higher education in Kazakhstan is formed not so much by overt exclusion, but rather by gradual and cumulative processes. This confirms the initial hypothesis that formal accessibility does not

guarantee meaningful equality. Despite women's active participation in higher education and the formal gender-neutrality of admissions procedures, opportunities are distributed unevenly across institutions, programs, and educational trajectories. Thus, the findings correlate with broader research that reveals that in mass higher education systems, inequality manifests itself not only at the admissions stage but also through stratification of access to prestigious, well-resourced, and socially significant forms of education (Boliver, 2017; UNESCO, 2024).

An important conclusion of the study is the understanding of access as a continuous process, not a one-time event. The analysis demonstrates that inequality begins to emerge long before applications are submitted, during the stages of school socialization and the formation of family expectations, when girls develop aspirations, mobility horizons, and ideas about acceptable educational paths. This has implications for theoretical models, as it demonstrates the role of cultural norms as early filtering factors. The interviews do not reveal large-scale, direct prohibitions on education for women; rather, inequality is reproduced through subtle forms of governance, symbolic boundaries, and normalized expectations about a "suitable" future for women. This interpretation is consistent with data indicating that gender inequality is often reinforced by everyday cultural assumptions, not just overt discrimination (Durrani et al., 2022; UN Women Regional Office for Europe and Central Asia, 2024).

The results also indicate that formally meritocratic competition is largely determined by unequal access to resources. In the Kazakhstani context, enrollment and retention in education depend not only on academic performance but also on the ability to cover a wide range of expenses, including tutoring, transportation, relocation, accommodation, and daily needs. This suggests that competitive advantages are largely determined by household financial capacity and willingness to invest, rather than solely by academic achievement. In the post-Soviet context, this finding supports the thesis that market-oriented reforms in higher education have shifted some of the risks from the state to families, increasing dependence on private resources for access. Financial pressures for women become particularly acute when coupled with cultural notions of mobility, security, and the perceived return on investment in daughters' education (World Bank, 2023; Baikenov & Hajar, 2025).

Regional and linguistic differences further complicate the situation. The concentration of leading universities in large cities makes high-quality education less accessible without mobility, resulting in an unevenly distributed resource. For women, moving is associated not only with financial costs but also with social and cultural barriers, particularly where independent movement is daunting or where language factors impact confidence and adaptation. This demonstrates the impossibility of examining gender inequality without considering regional, linguistic, and class factors. Consequently, the data highlight the importance of an intersectional approach that captures diversity among women and demonstrates that aggregate participation rates obscure critical differences in vulnerability and advantage within subgroups (Crenshaw, 1989; Risman, 2004).

Another significant contribution of the study is its identification of institutional processes that occur after formal admission. Interviews reveal that inequalities are not eliminated upon entry into university. On the contrary, they persist due to differences in access to information, support, mentoring, housing, and a sense of belonging during the initial stages of university life. Despite universities' procedural neutrality, in practice they favor those who possess the necessary knowledge, confidence, and support to successfully engage with them. This finding is important because it shifts the focus from the single moment of admission to the processes of resilience and early adaptation, which are key components of access. In this context, the study confirms institutional theories that organizations can reproduce inequalities through routine practices even in the absence of explicit discriminatory rules (Acker, 1990; UNICEF Kazakhstan, 2023).

Analysis of digitalization adds an additional dimension to the discussion. Digital platforms can reduce certain barriers by simplifying procedures and expanding access to information, but they can also reproduce inequalities, as successful use requires digital literacy, a stable internet connection, and confidence in navigating formal online systems. Therefore, digitalization cannot be viewed as a uniquely democratizing factor. It functions as a contingent mechanism whose effectiveness varies depending on the resources and capabilities of users. This is particularly important in the field of education management, where digital reforms are typically analyzed from the perspective of efficiency and transparency, while their differential impact on access is understudied (International Telecommunication Union, 2024).

These findings, taken together, help bridge the gap in existing literature, which often treats cultural norms, economic barriers, regional characteristics, and institutional processes as separate factors. This study demonstrates that these mechanisms should be understood as interrelated and cascading elements. Cultural expectations influence aspirations and choices; material resources determine competitiveness and mobility; institutional practices regulate admission, adaptation, and retention. The study's primary contribution lies in its empirical demonstration of a process-based model of access, where inequality is cumulative and relational, rather than a random event or a purely isolated barrier. Using Kazakhstan as a case study, the study goes beyond participation statistics and formal rules, demonstrating how various mechanisms interact at different stages of the educational trajectory (Fraser, 2005; Crenshaw, 1989).

From a policy and management perspective, the results highlight that assessing equality cannot be limited to female enrollment rates alone. A more comprehensive analysis requires considering the distribution of women across university types, study tracks, regions, and language groups, as well as examining their experiences of the transition to higher education. Consequently, policy interventions should address the early stages of developing educational aspirations, hidden financial costs, regional and linguistic inequalities, institutional support for first-year students, and the inclusiveness of digital educational resources. In this vein, the study argues that achieving genuine equality requires not only formally maintaining access, but also rethinking the conditions that ensure its implementation and support.

6. Conclusion

This study reveals that gender inequality in access to higher education in Kazakhstan manifests itself primarily through gradual and cumulative processes, rather than through outright exclusion. Despite the formally open nature of higher education and the active participation of women, access to more prestigious and stable educational pathways remains unevenly distributed. The findings suggest that access is not a matter of admission, but rather a multi-stage process shaped by cultural expectations, economic constraints, and institutional mechanisms.

These findings suggest that gender differences emerge even before university enrollment. Expectations that influence ambitions, confidence, and perceptions of acceptable educational paths are formed through school socialization and family decision-making. These differences are further exacerbated by financial constraints, regional disparities, language barriers, differences in access to information, and institutional practices that, although seemingly neutral, often favor those with greater resources. Thus, inequality accumulates throughout the educational trajectory, rather than emerging at a single point.

Another important finding is the heterogeneity of women's experiences as a group. Barriers vary by region, socio-family resources, language of instruction, type of university, and field of study. This helps us understand why similar formal rules lead to disparate outcomes among different groups of women.

The practical significance of this study lies in its demonstration of the inadequacy of assessing equality based solely on overall female participation rates. A more accurate analysis requires taking into account differences between universities, fields of study, regions, and linguistic communities, as well as paying attention to the adjustment period in the early stages of education. The findings highlight the need for comprehensive policy measures aimed at reducing hidden costs, expanding access across regions and linguistic groups, strengthening support in the early years of education, and improving inclusive educational practices.

Although the study is based on a relatively small qualitative sample, it provides a deeper understanding of the mechanisms of reproduction and experience of inequality in education. Achieving real equality requires not only formal access but also changes in the conditions that shape women's educational trajectories.

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Who Did It? Framing Gender-Based Violence through Language in Kazakhstani Media

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ABSTRACT

This paper examines how Russian-language Kazakhstani online news framed gender-based violence during 2024, a pivotal year marked by the trial of former minister Kuandyk Bishimbayev and the passage of the law commonly known as the Saltanat Nukenova Law. Combining qualitative content analysis with Critical Discourse Analysis, the study analysed 30 articles from Tengrinews.kz, Zakon.kz, and Nur.kz and coded 1,196 segments at two levels: micro-linguistic features (voice, agency, nominalization) and Entman's four framing functions (problem definition, causal attribution, moral evaluation, and treatment recommendation). Violence was found to be predominantly encoded through passive, impersonal, and nominalized constructions that background or remove the perpetrator, with abstract or impersonal entities appearing as the grammatical subject more often than perpetrators themselves. At the framing level, coverage was dominated by a neutral, legalistic register; causal attribution was frequently absent or framed as mutual conflict; and a structural or gendered understanding of violence was absent across the corpus. Victims were defined almost exclusively through their relationship to the perpetrator, whereas perpetrators holding institutional roles were introduced by professional title. The paper argues that these linguistic and framing patterns operate together to depersonalize violence and obscure responsibility, and it draws out implications for more accountable reporting on gender-based violence in Kazakhstan.

KEYWORDS: gender-based violence; media framing; Critical Discourse Analysis; linguistic agency; Kazakhstan; Russian-language media

1 INTRODUCTION

In 2024, gender-based violence became one of the most visible social and political issues in Kazakhstan. The murder of Saltanat Nukenova by her husband, former Minister of National Economy Kuandyk Bishimbayev, and the nationally watched trial that followed brought domestic violence into the centre of public discussion; the trial was broadcast live for the first time in Kazakhstan's history, and millions of people in Kazakhstan and abroad followed it closely (Kuanova, 2024). In April 2024, President Kassym-Jomart Tokayev signed the law that later became known as the “Saltanat Nukenova Law” (Law of the Republic of Kazakhstan dated 15 April 2024 No. 72-VIII), adopted after several years of debate over Kazakhstan’s legal approach to domestic violence, especially after the 2017 decriminalization of battery and minor bodily harm. Commentators questioned whether the new legal framework would translate into real protection in practice (Omarova, 2024). Media coverage therefore did not merely report on gender-based

violence as a series of isolated cases; it also participated in constructing the issue as a matter of public concern, providing the language through which the public could discuss it and shaping how responsibility, victimhood, and accountability were represented.

Although Kazakhstani media have actively reported on gender-based violence, their language often obscures the identity or agency of perpetrators. A headline may state that "a woman was brutally beaten" rather than that "a man beat a woman"; the first formulation backgrounds the agent, while the second names the perpetrator. This distinction is not only grammatical but also ideological and interpretive: linguistic choices such as passive voice, impersonal constructions, nominalization, and agent omission influence how responsibility is distributed in a text, and research on media language and violence shows that such patterns can reduce the visibility of perpetrator responsibility and contribute to victim-blaming or depersonalized representations of violence (Frazer & Miller, 2009; Lamb, 1991; Meluzzi et al., 2021). In Kazakhstan this issue is especially important because victim-blaming remains a strong social problem: official and media discourse may focus on victims, family conflict, alcohol, poverty, or "household" circumstances rather than clearly naming male violence or gendered power relations, even though Mussabekova et al. (2024) show that in almost 90% of domestic violence cases the perpetrator was a man and the victim was a woman.

Existing Kazakhstani studies have examined gender-based violence from sociological, psychological, legal, and broad media-representation perspectives, but fewer studies focus specifically on the micro-linguistic mechanisms through which media texts construct perpetrators and victims. In particular, there is a gap in research combining Entman's (1993) four framing functions with close linguistic analysis of voice, agency, and nominalization in Russian-language Kazakhstani news coverage. This paper addresses that gap by asking: RQ1: How do Russian-language Kazakhstani online news outlets frame gender-based violence? RQ2: How do grammatical and lexical choices such as voice, agency, nominalization, impersonalization, and evaluative language shape the attribution of agency and responsibility in news reporting? The study focuses on Russian-language online coverage of physical violence and sexual misconduct against adult women in Tengrinews.kz, Zakon.kz, and Nur.kz during the full calendar year 2024, a year selected because it encompassed both the Bishimbayev trial and the adoption of the Saltanat Nukenova Law.

The paper is significant because it moves beyond the question of whether media report violence and asks how they report it. It contributes to Kazakhstani media studies by providing a focused analysis of Russian-language online news coverage, and it contributes methodologically by combining framing theory with micro-linguistic analysis informed by Critical Discourse Analysis. The findings may also be useful for journalists, editors, media educators, and civil society actors concerned with more accountable reporting on gender-based violence.

2 LITERATURE REVIEW

2.1 Framing Theory and Media Discourse

Entman (1993) defines framing as selecting some aspects of perceived reality and making them more salient in communication in order to promote a particular problem definition, causal interpretation, moral evaluation, or treatment recommendation. These four functions are especially useful for analysing coverage of gender-based violence because they show how media define the issue, assign responsibility, evaluate actors, and imply solutions. Bullock (2007) applies the four

functions to domestic violence fatalities and demonstrates how news framing shapes the public meaning of violence, and Semetko and Valkenburg (2000) identify attribution of responsibility as a central frame in news coverage more broadly. Gender-based violence reporting has also been shown to rely disproportionately on episodic rather than thematic framing, presenting violence as an individual incident rather than as part of systemic gender inequality (Iyengar, 1991, as cited in Semetko & Valkenburg, 2000), which can weaken public recognition of structural causes.

From a social-constructivist perspective, media do not simply transmit facts; they organize reality into patterns and meanings that can become normalized as common sense when repeated (Easteal et al., 2015; Scheufele, 1999). Alat (2006) and Berns (2001) argue that media representations can support hegemonic gender ideologies and shape how audiences understand social problems such as domestic violence, so that media language is not a neutral channel but can itself reproduce victim-blaming or obscure structural inequality.

2.2 Linguistic Choice, Agency, and Responsibility

Language is central to the framing of gender-based violence because grammar determines who appears as the actor, who appears as the object of action, and whether responsibility is made visible or hidden (Fairclough, 2003). Lamb (1991) shows that violence can be described as an act without an agent when grammatical structures remove or background the responsible person, most commonly through the passive voice: instead of "a man beat a woman", a text may say "a woman was beaten", describing harm without naming its cause. Frazer and Miller (2009) show that such passive constructions are frequent in domestic-violence narratives and contribute to double standards in responsibility attribution, while Lamb and Keon (1995) and Henley et al. (1995) show experimentally that passive syntax and agent deletion measurably reduce readers' attribution of responsibility to perpetrators. Nominalization — turning actions into abstract nouns such as "the incident" or "the beating" — performs a related function, removing the human actor and making violence appear detached from responsibility (Fairclough, 2003).

Impersonal constructions are especially important for Russian-language media, which allow formulations such as произошло убийство ("a murder occurred") that present violence as an event that happened rather than an act committed by someone and that do not correspond neatly to the English active/passive distinction. This study therefore follows Kulagina (2022), whose work on domestic violence and femicide in Russian media treats impersonal and reflexive constructions as a distinct analytic category rather than forcing them into an English-derived binary.

2.3 Gender-Based Violence, Kazakhstani and Russian-Language Media

Internationally, media coverage of gender-based violence often minimizes its gendered and structural dimensions, framing fatalities as isolated tragedies (Bullock, 2007) and omitting structural context (Easteal et al., 2015). Berns (2001) identifies "degendering the problem" — reframing violence against women as gender-neutral "family violence" — as a major discursive pattern, and media may also reduce empathy and increase blame toward female victims (Anastasio & Costa, 2004) or reinforce objectification and traditional gender roles (Sáez et al., 2022; Santoniccolo et al., 2023).

In the Kazakhstani context, Arystanbek (2023) shows how women are positioned in relation to family harmony, endurance, and national tradition in online discourse, while Alzhanova et al. (2024) argue that journalistic language may portray women as partly responsible for the violence committed against them. Ayhan and Nabieva (2025), writing on Kyrgyz media, document

comparable patriarchal patterns across the region. However, these studies generally address broad discursive themes rather than the grammatical mechanisms — voice, nominalization, impersonalization, agent deletion — that construct responsibility at the sentence level. Research on Russian-language media directly addresses this gap: Kulagina (2022) examines linguistic mechanisms in Russian coverage of femicide, and Davidenko et al. (2024) show that Russian media often use abstract, depoliticized language that frames violence as mutual conflict and avoids direct naming of responsibility amid a broader conservative political shift. Andreevskikh (2024) further shows that some Russian liberal outlets are developing an alternative reporting register centred on survivor voices, though whether comparable practices exist in Kazakhstani Russian-language media remains unstudied.

Taken together, the literature establishes the importance of framing and linguistic agency for understanding coverage of gender-based violence but leaves a specific gap: an integrated study combining Entman's framing functions with micro-linguistic analysis of agency and responsibility in Russian-language Kazakhstani online media. Table 1 summarizes the conceptual framework that this paper uses to close that gap.

Table 1. Conceptual Framework

Analytical level	Concept	Source basis	Application in this study
Framing	Problem definition	Entman (1993)	Whether GBV is framed as crime, tragedy, conflict, private matter, or social problem
Framing	Causal interpretation	Entman (1993)	Whether responsibility is assigned to perpetrator, victim, circumstance, or institution
Framing	Moral evaluation	Entman (1993)	Whether the text condemns, sympathizes, normalizes, or remains neutral
Framing	Treatment recommendation	Entman (1993)	Whether a legal, social, institutional, or no solution is suggested
Linguistic	Voice	Lamb (1991); Frazer & Miller (2009); Henley et al. (1995)	Codes active, passive, and agentless constructions
Linguistic	Agency	Entman (1993); Lamb & Keon (1995)	Identifies who occupies the grammatical/social actor position
Linguistic	Nominalization	Fairclough (2003); Lamb (1991)	Identifies cases where actions are turned into abstract nouns

3 METHODOLOGY

3.1 Research Design

This study adopts a qualitative research design situated within an interpretivist paradigm. The aim is not to measure audience effects or establish objective frequencies, but to understand how the social meanings of gender-based violence — particularly agency, responsibility, and the positioning of perpetrators and victims — are constructed through language in Russian-language Kazakhstani online news. From this perspective, news articles are treated as sites of meaning-making rather than neutral records of events (Fairclough, 2003; Hall, 1997). The study combines two complementary methods: qualitative content analysis, which provides a structured framework for identifying recurring patterns across the dataset (Entman, 1993), and Critical Discourse Analysis in the tradition of Fairclough (2003), which examines how specific linguistic choices — voice, nominalization, and agency assignment — encode ideological assumptions and reproduce or challenge gendered relations of power.

The researcher is a journalist with more than seven years of experience in Russian-language Kazakhstani media, including direct experience covering gender-based violence. This background is treated as both a resource, providing familiarity with editorial conventions and register, and a risk, since close familiarity with the media environment may shape interpretation in ways that are difficult to detect from within. To manage this risk, the analysis follows explicit theory-grounded coding categories, applies a pilot coding round before full coding, maintains analytic memos throughout, and incorporates peer debriefing with the supervisor on a subset of coded excerpts.

3.2 Data Collection and Sampling

The dataset consists of Russian-language news articles from Tengrinews.kz, Zakon.kz, and Nur.kz, three of the most widely read online news sources in Kazakhstan, covering the period 1 January to 31 December 2024. Articles were identified through keyword searches for избиение (beating), убийство (murder), and домашнее насилие (domestic violence), reflecting the terminology Davidenko et al. (2024) identify as typical of Russian-language reporting. Articles were included if they were published within the study period on one of the three outlets, reported physical violence or sexual misconduct against an adult woman occurring within Kazakhstan, allowed the perpetrator to be identified at least by gender, and were written in Russian; opinion columns, editorials, purely statistical reports, and cases involving minors were excluded.

Search results returned 297, 134, and 30 articles for the three respective terms on Tengrinews.kz; 218, 63, and 44 on Zakon.kz; and 180, 60, and 104 on Nur.kz. From the results meeting the inclusion criteria, a final corpus of 30 articles was assembled through purposive selection designed to capture variation across outlets, event types, and reporting periods, comprising six articles from Nur.kz, eleven from Tengrinews.kz, and thirteen from Zakon.kz. Following established practice in qualitative CDA research, sample size was determined by analytical sufficiency rather than statistical representativeness: 30 articles were judged sufficient to support systematic pattern identification within the depth feasible for a single-coder project (cf. Kulagina, 2022; Davidenko et al., 2024).

3.3 Codebook and Coding Procedure

Coding was conducted in ATLAS.ti at three units of analysis — headlines, sentences describing acts of violence, and paragraphs describing the perpetrator, victim, act, cause, or consequence — and at two analytical levels applied in dialogue with one another. At the linguistic level, each unit was coded for voice (active, passive with agent, passive without agent, or impersonal/reflexive), agency (perpetrator, victim, abstract/depersonalized, or institutional actor as grammatical subject), and nominalization (none, legal/procedural, or action nominalization). At the framing level, the same units were coded for Entman's (1993) four functions: problem definition, causal attribution, moral evaluation, and treatment recommendation, each with a deductive set of categories refined during a pilot coding round on three to five articles (Table 2). The pilot stage added an institutional-actor code for clauses in which police or courts occupy the subject position, split nominalization into legal/procedural and action subtypes, and expanded problem-definition and causal-attribution categories to fit recurrent Russian-language patterns not captured by the initial English-derived scheme.

Table 2. Coding Categories (Summary)

Variable	Categories
Voice (V)	V-ACT active; V-PASS-AG passive, agent named; V-PASS-NO passive, no agent; V-IMP impersonal/reflexive
Agency (AG)	AG-PERP perpetrator; AG-VIC victim; AG-ABSTR abstract/depersonalized; AG-INST institutional actor
Nominalization (NM)	NM-NONE direct verbalization; NM-LEG legal/procedural nominalization; NM-ACT action nominalization
Problem Definition (PD)	PD-CRIME criminal act; PD-FAM family/domestic tragedy; PD-LEGAL legal/procedural case; PD-SOC structural/social problem; PD-SCAN public scandal; PD-DESC descriptive/unframed
Causal Attribution (CA)	CA-PERP perpetrator-centred; CA-VIC victim-centred; CA-EXT external circumstance; CA-SYS systemic/institutional failure; CA-REL relational conflict; CA-NONE no attribution
Moral Evaluation (ME)	ME-COND condemnation; ME-VB victim-blaming; ME-SYM sympathetic to victim; ME-PJ perpetrator-justifying; ME-NEUT neutral/no evaluation
Treatment Recommendation (TR)	TR-LEG legal punishment; TR-INV investigation; TR-LEGIS legislative reform; TR-NGO social support/NGO; TR-AWR awareness/prevention; TR-NONE no recommendation

3.4 Validation and Ethics

As a single-coder qualitative study, this paper does not claim formal inter-coder reliability of the kind appropriate to large-scale quantitative content analysis. Trustworthiness was instead supported through the pilot coding round used to stabilize the codebook, an audit trail of analytic

memos documenting interpretive decisions, and a peer-debriefing step in which a subset of coded excerpts was reviewed with the supervisor. The study analyses publicly available news articles and does not involve direct interaction with human participants; references to named public figures such as the Nukenova case follow the public record, while examples involving less-public individuals avoid unnecessary identifying detail.

4 FINDINGS

The dataset comprises 30 Russian-language news articles published in 2024 across Tengrinews.kz, Zakon.kz, and Nur.kz, identified as three of Kazakhstan's most popular news websites (RMAA, 2025). All coding was conducted in Russian to preserve linguistic nuance, yielding 1,196 coded segments across the linguistic and framing levels.

4.1 Linguistic-Level Results

Active voice, in which the perpetrator is the grammatical subject, accounts for only 34.7% of all voice-coded segments (61 of 176); the remaining 65% consists of passive and impersonal constructions that suppress or remove the acting agent. The 90 passive segments are split evenly between those that name an agent (45) and those that do not (45), with a further 25 segments in impersonal or agentless form. Across the 194 agency-coded segments, an abstract or impersonal entity is the most common grammatical subject, appearing in 32% of cases (63 segments) — more often than institutional actors such as police or courts (27%, 52 segments), victims (22%, 43 segments), or perpetrators, who occupy the subject position in only 19% of segments (36). Nominalization is also frequent: legal or procedural nominalization is the single largest category, accounting for 38% of nominalization-coded segments (73 of 191); when legal and action nominalization are combined they cover 68% of segments, while direct verbalization through a finite verb is used in only 32% of cases (62 of 191). Full distributions are reported in Table 3. Percentages in the text are rounded to the nearest whole number and in the tables to one decimal place, so totals may not sum to exactly 100.

Table 3. Linguistic-Level Coding Results

Code	Category	n	%
	Voice (n = 176)		
V-ACT	Active voice	61	34.7
V-PASS-AG	Passive, agent named	45	25.6
V-PASS-NO	Passive, no agent	45	25.6
V-IMP	Impersonal / reflexive	25	14.2
	Agency (n = 194)		
AG-ABSTR	Abstract / impersonal	63	32.5
AG-INST	Institutional actor (police, courts)	52	26.8

AG-VIC	Victim	43	22.2
AG-PERP	Perpetrator	36	18.6
	Nominalization (n = 191)		
NM-LEG	Legal / procedural nominalization	73	38.2
NM-ACT	Action / general nominalization	56	29.3
NM-NONE	Direct verbalization (no nominalization)	62	32.5

4.2 Framing-Level Results

At the framing level, problem definition is dominated by descriptive and procedural framing rather than by an explicit crime or social frame. The largest category is descriptive, unframed coverage — a bare factual account with no clear interpretive frame — accounting for 34% of problem-definition segments (75 of 224). The next largest is the legal or procedural frame, foregrounding investigations and court process rather than the violent act itself, at 27% (60 segments). The family or domestic frame accounts for 20% (44 segments), the crime frame for 11% (24 segments), and the public-scandal frame for 9% (21 segments); the social or systemic frame, which would present violence as a symptom of gender inequality, was not found in any segment across the corpus.

Causal attribution is most often absent: in 63% of causal-attribution segments (125 of 198) no cause is given at all. When a cause is attributed, it is most often framed as a relational or mutual conflict between the parties (27%, 54 segments); external circumstances such as alcohol or stress account for 5% (10 segments) and the victim's own behaviour for 3% (5 segments), while attribution to the perpetrator's own character or decisions appears in only 3 segments and attribution to systemic or institutional failure in a single segment across the entire corpus. Moral evaluation is almost entirely absent: a neutral, legalistic register accounts for 94% of moral-evaluation segments (171 of 181), with sympathy toward the victim in 5 segments, condemnation of the perpetrator in 2, victim-blaming in 2, and perpetrator-justifying language in 1 — counts too small to constitute patterns but reported for accuracy. Most segments contain no treatment recommendation (21 of 32); where one appears it is most often legal and punitive (8 segments), while calls for further investigation, social support, or public awareness each appear only once, legislative reform is absent entirely, and only one article points readers toward a support service. Full distributions are reported in Table 4.

Table 4. Framing-Level Coding Results

Code	Category	n	%
	Problem definition (n = 224)		
PD-DESC	Descriptive / unframed	75	33.5
PD-LEGAL	Legal / procedural case	60	26.8

PD-FAM	Family / domestic	44	19.6
PD-CRIME	Criminal act	24	10.7
PD-SCAN	Public scandal	21	9.4
PD-SOC	Social / structural problem	0	0.0
	Causal attribution (n = 198)		
CA-NONE	No attribution	125	63.1
CA-REL	Relational / mutual conflict	54	27.3
CA-EXT	External circumstance (alcohol, stress)	10	5.1
CA-VIC	Victim-centred	5	2.5
CA-PERP	Perpetrator-centred	3	1.5
CA-SYS	Systemic / institutional failure	1	0.5
	Moral evaluation (n = 181)		
ME-NEUT	Neutral / legalistic register	171	94.5
ME-SYM	Sympathy for victim	5	2.8
ME-COND	Condemnation of perpetrator	2	1.1
ME-VB	Victim-blaming	2	1.1
ME-PJ	Perpetrator-justifying	1	0.6
	Treatment recommendation (n = 32)		
TR-NONE	No recommendation	21	65.6
TR-LEG	Legal punishment	8	25.0
TR-AWR	Awareness / prevention	1	3.1
TR-INV	Investigation	1	3.1
TR-NGO	Social support / NGO	1	3.1
TR-LEGIS	Legislative reform	0	0.0

4.3 The Construction of Perpetrators and Victims

Two consistent patterns emerge in how the corpus constructs perpetrators and victims socially. First, victims are identified almost exclusively through their relationship to the perpetrator — as ‘his wife’, ‘his cohabitant’, or ‘the victim’ — with no independent professional or biographical identity given in the text, whereas perpetrators holding institutional roles, such as a diplomat, a city official, or a former district head, are introduced by their professional title in the headline or opening sentence; no victim in the corpus receives equivalent institutional

identification. Second, victim deaths are frequently expressed through intransitive verbs — ‘she died’, ‘she passed away on the spot’ — presenting death as an occurrence without an agent. Together, these lexical choices construct the perpetrator as socially visible through his professional role, while the victim is constructed as relationally defined, anonymous, and grammatically passive, and violence itself is presented as an occurrence rather than as the result of the perpetrator’s deliberate action.

5 DISCUSSION

5.1 Framing Gender-Based Violence (RQ1)

In response to RQ1, coverage was organized predominantly around a descriptive and a legal-procedural frame, while a structural or gendered frame was entirely absent. This pattern is consistent with international research on episodic and depoliticized reporting: Bullock (2007) and Easteal et al. (2015) describe how violence against women is routinely presented as a discrete incident or private tragedy rather than as a manifestation of systemic inequality, and the complete absence of a social or systemic frame in this corpus is a particularly stark instance of that tendency. It corresponds closely to what Berns (2001) terms degendering the problem: when violence is narrated through legal procedure or household conflict, its gendered structure is rendered invisible even though, as Mussabekova et al. (2024) document, the overwhelming majority of such cases involve a male perpetrator and a female victim. The dominance of a neutral, legalistic register, together with the frequent absence of causal attribution, also echoes Davidenko et al. (2024), who find that Russian-language reporting tends toward abstract, depoliticized language that withdraws attention from gendered power relations. This finding should nonetheless be read with some caution, since opinion columns and editorials — the genres in which structural and explicitly gendered framing most often appears — were excluded from the sample, so the absence may partly reflect the hard-news composition of the corpus rather than an absolute absence of structural framing in Kazakhstani public discourse.

5.2 Grammar, Agency, and Responsibility (RQ2)

In response to RQ2, the linguistic findings show that grammatical choices systematically backgrounded perpetrators: passive and impersonal constructions outnumbered active ones, agentless passives were as common as agented passives, and abstract or impersonal entities occupied the grammatical subject position more often than perpetrators did. These results provide direct textual confirmation, in a Russian-language setting, of mechanisms long theorized in English-language scholarship. Lamb (1991) describes the construction of acts without agents, and Frazer and Miller (2009) and Henley et al. (1995) show experimentally that passive voice and agent deletion reduce the attribution of perpetrator responsibility. The prominence of impersonal and reflexive constructions in the corpus underscores the value of treating these as a distinct category rather than forcing them into the English active/passive binary, as Kulagina (2022) argues. Nominalization compounded this effect: by recoding violence as legal or procedural abstraction, the texts converted human actions into events, so that responsibility receded even where no grammatical passive was used. Read alongside the framing results, the linguistic evidence indicates that depersonalized causal attribution at the framing level was enacted, sentence by sentence, through specific grammatical resources.

5.3 Implications for Reporting Practice

The two levels of analysis converge most clearly in how social actors were constructed: victims named almost exclusively through their relation to the perpetrator and frequently the subject of intransitive verbs of dying, and perpetrators with institutional standing introduced through professional titles. This asymmetry resonates with research on objectification and stereotyping in media representations of women (Sáez et al., 2022; Santoniccolo et al., 2023) and with regional work on hegemonic femininity, in which women are positioned relationally through family and morality rather than as autonomous social subjects (Arystanbek, 2023). Because agency and responsibility are distributed through concrete and largely routine grammatical choices, they are also amenable to change: naming the perpetrator as grammatical subject, preferring finite verbs to nominalizations, retaining agents in passive constructions, and providing causal and structural context are all achievable editorial practices. The near-total absence of references to support services or sources of help further suggests a concrete avenue for more responsible coverage. These implications are offered as analytically grounded observations rather than as claims about audience effects, which fall outside the scope of a textual study.

6 CONCLUSION

This paper set out to identify the dominant frames of gender-based violence in Russian-language Kazakhstani online news during 2024 and to examine how linguistic choices construct representations of perpetrators and victims. Through a two-level analysis combining Entman's framing functions with Critical Discourse Analysis across 30 articles and 1,196 coded segments, it found a consistent pattern: violence was framed through legal procedure and private dispute rather than as a structural or gendered problem, and it was encoded grammatically through passive, impersonal, and nominalized constructions that backgrounded perpetrators and depersonalized harm, while victims were constructed as relational and anonymous and perpetrators as institutionally visible.

The study makes two contributions. Substantively, it provides an integrated account of how responsibility and agency are encoded at the level of grammar in Kazakhstani Russian-language reporting on gender-based violence, moving beyond analysis of broad themes. Methodologically, it demonstrates the value of linking macro-level framing to micro-level linguistic analysis, with explicit attention to Russian-specific structures that do not map onto English-language categories. The findings should be read in light of the study's limitations: a single-coder design, a focus on three Russian-language online outlets in a single and unusually intensive year, and the exclusion of opinion genres. Future research could extend the framework to Kazakh-language media, television, and social platforms; compare peak and routine reporting periods across several years; incorporate inter-coder reliability; and complement textual analysis with audience-reception research to test how the representational patterns identified here are actually interpreted by readers.

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Assessing Academic Scholarship Opportunities for Kazakh Youth: A Study of the Policy Design of Bolashak Government Scholarship

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INTRODUCTION

Once one gets their bachelor's degree and decides to pursue a master's degree, how do they choose? Academic ambition is not the only consideration of many young people in Kazakhstan when deciding to study abroad. It is also a choice concerning risk and freedom, family, and the type of future they are going to devote themselves to. Scholarships can appear as an opportunity tool, as they are opening doors to access top universities in the world, to become a professional, and build a secure future. However, not every scholarship feels equally empowering: while some are felt as empowering, others are burdensome, challenging, or even threatening.

This conflict becomes particularly obvious in the instance of the Bolashak International Scholarship that is one of the most well-known and symbolically significant programs of Kazakhstan. Since its establishment in 1993, Bolashak has been discussed as a national investment in human capital: the state sponsors overseas education for talented citizens in their turn to come back and contribute to national development. This is a logical and simple policy. However, in its core, it is more complex. A scholarship is not a mechanism of funding only, it is also a system of rules, expectations, and risks that determine simple things, starting with the pool of people who apply and receive the scholarships, types of schools and professions they get, and ending with futures that scholarships would have for the next couple of years.

That is the reason why simple statistics alone about the return rates, which are objectively high in the Bolashak program, don't tell much about the scholarship itself. They fail to demonstrate what people can apply to the scholarship in the first place, that some people are, in fact, demotivated by the program design, or about struggles and opportunities of those who do come back to apply their acquired knowledge in valuable ways later. They also fail to record the fact that Bolashak now is competing in an overcrowded scholarship environment. It is compared by Kazakhstani students not only to self-funded study abroad, but also to programs such as Erasmus Mundus, Women in STEM, Chevening, DAAD, KGSP, and many other international opportunities. It means that students now are considering the circumstances under which they would choose to study abroad, not the fact of going abroad itself.

Based on this knowledge, this article does not analyze Bolashak solely as a success story about the state or as a mechanism of preventing brain drain, but it looks up inside the policy of scholarship and sees the way it is working. It poses the question as to how young people perceive scholarship rules, how they choose between various scholarship regimes, and how those perceptions influence educational choice, and imagined reentry into the Kazakhstan labor market.

The research question that guides the study is as follows:

How do Kazakhstani students and graduates perceive, evaluate, and experience the policy design of Bolashak and other international scholarship programs, and how exactly do funding, obligations, administrative procedures, and individual motivations shape their decision-making?

It is a significant question of theory and practice. In theory, it changes the focus of scholarship solely on its outcomes and makes instead scholarship design a lived policy experience. Empirically, it assists in understanding why a program might seem powerful and valid at the point of state policy but still seem repressive, dangerous, or otherwise ill adapted to the lives of prospective applicants. In a larger sense, the paper maintains that scholarship programs are not merely seen as instruments of human capital creation, but also of the government that determines access, duty, membership, and future.

Theoretical Framing and Literature Review.

Human capital is often seen as the main rationale behind international scholarship programs. In this perspective, states invest abroad in education to help them prepare specialists, reinforce their institutions, and accelerate modernization. This reasoning has been particularly strong in transitional and developing countries, where earned degrees in top foreign universities can be viewed as a response to domestic capacity shortfalls and an effort to create a globally competitive workforce that will work for the country's economy. Bolashak is very suitable for this type of model: it was created as a state-funded program of generating highly competent professionals that, after returning, would be capable of contributing to the economic and institutional progress of Kazakhstan (Perna et al., 2015; Sagintayeva and Jumakulov, 2015).

However, the human capital lens is significant, but not sufficient when applied alone. It describes the reason why states invest in such programs, yet it does not describe why the identical scholarship can be transforming in one instance and restrictive in another. And neither does it help to understand why some individuals view a scholarship as a life-altering event and others, who also have the qualifications, simply dismiss it before they even apply. The available literature also demonstrates that the results of human capital are not predetermined: although alumni are ready to be hired, their influence is determined by the success of labor market absorption, workplace hierarchy, and institutional ability to effectively utilize their skills (Jonbekova, 2023).

Policy design and Calibration

So to answer these questions, the lens of policy design should also be utilized. Scholarship programs are not run exclusively through general objectives. They work according to certain rules: who is eligible, which universities are counted, what guarantee is needed, how it is checked, how it is paid back, and how well all this is explained. This information is important since it determines the practicality of a policy. The same scholarship can be generous on paper and yet still not be conceived of as accessible, or experienced as stressful, or even exempt due to how its requirements are set. Program effects in the scholarship literature, more generally, have been found to vary not only due to the funding, but also the program characteristics and contextual conditions that support and limit participation and contribution (Perna et al., 2015; Mawer, 2017).

This particularly applies to Bolashak. Accountability mechanisms, in the case of Kazakhstan, are not side effects. They are the main part of the identity of the program. The requirement of returns, collateral schemes, authorized university lists, reporting, and employment expectations all indicate that the program is not a mere giving scheme; it is a national investment that is being handled. That is why Bolashak is a good example to be used to research not only scholarship funding, but also governance of a scholarship (Perna et al., 2015; Del Sordi, 2018).

Social construction of target populations

The second lens is about the social construction of target populations. Policies are never neutral. They have presuppositions concerning whom to offer support, whom to trust, and what types of beneficiaries are regarded as useful. Scholarship programs tend to visualize recipients as worthy, promising, forward-looking citizens: the ones to whom the country should invest. At the same time, enforcement mechanisms may reflect suspicion toward possible noncompliance. This is significant because it helps in explaining why scholarship holders can both be celebrated and controlled. In Bolashak, talent and national potential are publicly glorified, and some of its design features point to the fear of risk, non-return, and control. Such messages are not abstract as they are easily perceived by the applicant themselves.

Policy feedback

The lens of policy feedback brings this point further. Policies do not simply exist as a method of distributing resources; they also form the manner in which individuals think and perceive the state, themselves, and the purpose of participation. A policy can create a sense of feeling of appreciation, trust, and legitimacy towards the state. However, it can also produce anxiety, dependence, resentment, or withdrawal, particularly when the administrative experience is felt to be oppressive and moralizing.

In addition to material effects, policies produce interpretive effects that directly affect the perception of recipients. of scholarship policy, which constitute identities, participation, as well as long-term legitimacy. This theory explains that the policies communicate to people what kind of relationship they are supposed to have with the state: a person can feel accepted and recognized, or it may also make them feel spied on, tied, or judged for something they did not necessarily anticipate. This can be seen in the works on Bolashak, which prove the contradiction between the dreams of development and migration policy and the state's efforts to keep talents by organizing the regulations (Bokayev et al., 2020; Del Sordi, 2018).

Put together, these perceptions suggest that Bolashak can be considered as something beyond a human capital investment program. It is a policy regime that also punishes, encourages, announces, and categorizes. It deems opportunity, but also determines the meaning of opportunity. This broader view is what is especially important in the context of the limitations of the methodology of evaluation of scholarship, where it can often be difficult to identify direct causes and effects, and it might be more practical to examine and evaluate pathways, mechanisms, and contributions instead (Mawer, 2017; Perna et al., 2015). It is the gap that this article discusses. The present-day literature on Bolashak has noted such positive features as development, mobility, patriotism, return, and state strategy (Perna et al., 2015; Del Sordi, 2018; Bokayev et al., 2020; Jonbekova, 2023).

Nevertheless, only a small number of studies ask how policy design is lived as experienced by those who maneuver within the scholarship, and even fewer attempt to forge that experience of living to a bigger table that links human capital, policy design, social construction, and policy feedback to a single analysis. In this paper, there is no effort to show that one of the models of scholarship is distinctly superior to another. Instead, it puts a more mundane question: how can policy design have lived meanings?

Methodology

The research design adopted in the study is a phenomenologically oriented qualitative research design. It is not aimed at quantifying the results of the scholarship statistically or making a general causal assertion of the efficacy of Bolashak compared with all other scholarships. Rather, it seeks to learn how people interpret the opportunity, obligation, and mobility through the policy design of scholarship programs, as financial support was not the only element that affected participation in scholarship, but also rules generated in the institution, administrative procedures, expectation of return, perceived fairness, and career trajectory expectations.

A phenomenological design was taken as it enabled the study to concentrate on the self-perception of the participants. The research was exploratory in nature. It did not start off with a predetermined end on whether scholarship policies worked or did not work. Rather, it sought to comprehend the influence of policy design on perceptions, choices, and experience, whether there existed discrepancies between what the policies claimed and what was experienced. Special emphasis was given to the financing schemes, conditions on bonding, as well as the eligibility, administrative conditions, and reintegration expectations into the labour market of Kazakhstan.

Information was gathered using semi-structured interviews. The choice was made on this approach due to its flexibility and structure. The interview guide provided the ability to make sure that every respondent was able to cover the central issues of the research questions, such as the choice of scholarship, the views on funding and commitments, administrative experiences, and the hopes concerning the returns and employment. Simultaneously, the participants had an opportunity to speak about the matters that they found most significant and explain the scholarship policies in their own words.

Online interviews based on Zoom and Microsoft Teams were used. The online interviewing was chosen due to the distance between the participants (they were in various locations, both inside and outside the country) and because the subject matter involved internationally mobile students and scholarship recipients in general. The internet format minimized logistical obstacles and increased the flexibility of scheduling. It also enabled the participants to sit in an environment where they were at ease, and in most cases, facilitated an open and reflective dialog.

Purposive sampling was used to recruit the participants, with the addition of convenience and snowball sampling. The individuals that were identified using the purposive sampling method had direct and relevant experience with the scholarship programs that were related to Kazakhstan. As a result, the interview sample consisted of eight participants of three types of scholarships, including five Bolashak applicants, two participants who were related to the Women in STEM scholarship, and one participant who was related to the Stipendium Hungaricum program. These categories of students were chosen so as to have a comparative analysis of programs whose funding structure, obligations, and flexibility levels varied. Approximately, each interview was 45 minutes long, and all of them were taken in the Russian Language.

The data was collected then transcribed by the researcher. The transcription was done manually, but the filler words and repeated fragments were slightly cleaned where they were irrelevant to the meaning. This made it easier to read and retain the content and character of the responses of the participants. As participants chose to participate in an interview in the Russian language, the transcription was translated to English, while words with untranslatable meaning were translated ideologically.

Thematic analysis was used in the analysis of the interview material. This analysis commenced with open coding, where the transcripts were read attentively, and preliminary labels were made on portions of texts that identified dominant perceptions, experiences, and ratings. The

references to the financial support, emotional pressure, collateral burden, flexibility, uncertainty of the rules, expectations of returns, and labour market issues were also present in these initial codes. The similar codes were in turn clustered into larger analytical codes, which were subsequently suggested into themes that were more direct to answer the research questions.

Like in most qualitative studies, the researcher actively participated in data collection, transcription, coding, and interpretation of data. Reflexivity was thus upheld during the research. The contextual knowledge was facilitated by the familiarity of the researcher to the context of higher education in Kazakhstan, whereas addressing possible bias was also a matter of concern. Interviews and analysis were conducted in a bid to be neutral and transparent. The research was voluntary, and there was no institutional power of the researcher over the subject of the research.

FINDINGS

Life Stage and Biography

When it came to Bolashak and its bonding agreement - that takes from 3 to 5 years, based on the location where working off after returning took place - the current life stage of a respondent played a significant role. In the case of the respondents in their early twenties, mobility was commonly visualized as a main component value of study abroad itself. The prospect of remaining open to other cities, occupations, and experiences was important. A five-year bonding commitment, in that regard, was critical to some young respondents. The identical bonding agreement, though, was termed as possibly highly more agreeable to a person who was of a greater age, more settled in their profession, or already geared towards family stability.

Bolashak is fair in Principle, but Overwhelming in Reality

Among the most visible conclusions is the fact that the respondents have not disapproved of the logic of Bolashak. They acknowledge that the state spends huge sums of state funds on each recipient and that it is generally agreeable that some sort of a payback commitment is correct.

Concurrently, justice in theory failed to neutralize affective materials in reality. Bolashak was several times mentioned by respondents as being stressful, intimidating, or morally heavy. This feeling was most often not caused by the return requirement itself. Frequently, it was the wider air of obligation surrounding the scholarship, in particular, the guarantor or collateral condition.

This was not an issue of mere technicality. It opened the likelihood of engaging family property in what otherwise may appear to be a personal educational choice. One respondent characterized it as “feeling a burden on their shoulders”. To others, that transformed the scholarship into a liability that they were not at ease to ask anybody to share it with them. The respondents still had a clear vision of how such a requirement would weed out competent contenders without solid financial support, even when blocked personally by collateral.

Theoretically, that point is significant. A policy can appear inclusive based on its stated requirements, but at the same time continue to generate inequality based on the mechanisms of accountability it utilizes. In that respect, access is not only subject to merit but also to social and material conditions.

Administrative Clarity and Information Overload

Many respondents characterized information sites, especially information about Bolashak, as being disorganized and hard to navigate. A problem associated with this was an interpretive ambiguity. Respondents remembered the occurrences in which the rules of scholarship seemed to be open to different interpretations, particularly those that involved delayed return, working abroad after the study, and exactly what some of the obligations included. This has made the applicants adopt informal means that involve Telegram, peers, bloggers, or alumni. Not only were such networks necessary, but another implication was that a section of the policy was read between the lines.

Scholarships as Freedom VS Control

One of the most obvious differences across the interviews was between the scholarships that were supportive and the scholarships that were controlling. This difference conditioned the way the respondents discussed Bolashak as opposed to other options like Women in STEM, Erasmus, or university scholarships.

Other scholarships were usually termed in gentler words. They did not necessarily seem to be easier in all respects, but they were felt to be less disciplinary. They had fewer responsibilities, their communication was warmer, and their organization, in general, gave a respondent a sense of ownership of their own course.

Instead, Bolashak was often described in terms of control: surveillance, reports, and facing punishment due to failure. Lots of people knew perfectly well why the state would set up the program in such a manner. However, the reasoned explanation did not take away the emotional impact.

Scholarships, its Favorites, and Interviews

What the interviews also reveal is that students are not gullible when it comes to scholarship politics. They know that scholarship programs are purposeful, priority-based, and target-oriented. The respondents were discussing Bolashak as a national developmental tool, which is also related to the agenda of modernization in Kazakhstan and the labour demand. It was often heard that the technical subjects received more institutional backing than the social sciences or the humanities. Respondents reported that they noticed from narratives in Telegram chats, or from stories from their friends, that applicants with a technical background had far more pleasing experiences with the interview stage of Bolashak than other candidates. Almost all candidates, however, reported that the quality of the excerpts interviewing them leaves questions.

DISCUSSION

The findings of this study suggest that scholarship policy is best understood not simply as a way of allocating resources, but as a lived system of governance. This is the main theoretical contribution of the paper.

First, the study adds to the human capital perspective by showing that funding and national development are only one part of the picture. Respondents clearly understood Bolashak as a program aimed at preparing future specialists, and many agreed with that purpose. At the same

time, their decisions were shaped just as much by personal motivation, mobility, family responsibilities, clarity of rules, and life stage. In other words, scholarship policy works not only through incentives, but also through how its conditions are experienced.

Second, the findings show the importance of policy design. Features such as collateral requirements, return obligations, approved university lists, communication, and administrative burden are not minor technical details. They play a direct role in shaping who feels able to participate, who hesitates, and who quietly leaves the process before even applying. This suggests that design is not separate from policy goals.

Third, the study highlights the interpretive effects of scholarship policy. Bolashak can generate gratitude and respect because it signals serious state investment in young people. At the same time, it can also create fear, caution, and a feeling of being tied down. This kind of mixed response is exactly what policy feedback theory helps explain. A policy can strengthen legitimacy while also producing forms of self-restraint among the people it is meant to support.

Fourth, the findings complicate narrow discussions of brain drain. Respondents were not generally against the idea of returning to Kazakhstan. Their concerns were more nuanced. They worried that returning too early could close off valuable opportunities, that local workplaces might not allow them to use their skills fully.

Finally, the study offers an important insight into fairness. Bolashak often appears reasonable within the logic of the state, and many respondents accepted that logic as fair. However, fairness in principle does not always mean fairness in lived experience. A policy may be rational, defensible, and nationally important, while still fitting some biographies much better than others. This does not make the policy illegitimate. But it does suggest that policy evaluation should pay closer attention to fit, burden, and emotional accessibility.

CONCLUSION

This paper explored how Kazakhstani students and recent graduates perceive the policy design of Bolashak and other international scholarships, and how they compare and experience these programs. Based on the qualitative interviews, the study shows that choosing a scholarship is not simply a matter of prestige or funding. It is also a negotiation between opportunity and obligation, freedom and pressure, desire and risk.

For many respondents, Bolashak appeared to be a legitimate and respected program. It was valued for its ambition, generosity, and developmental purpose. At the same time, it was often experienced as emotionally demanding, administratively heavy, and better suited to some life paths than others. Other scholarships were often seen as more attractive, not because they were more prestigious, but because they felt freer, less intimidating, and less burdened by strict obligations.

The findings also suggest that return rates alone should not be used to judge the effectiveness of a scholarship program. A fuller assessment should ask who feels able to choose the policy, how the policy is understood before and during participation, and whether return actually leads to meaningful reintegration and the use of acquired skills.

More broadly, this article argues that scholarship programs are not only investments in education. They are also systems of governance that shape belonging, deservingness, and the relationship between young citizens and the state. In the case of Kazakhstan, Bolashak has remained one of the country's most important tools of educational internationalization. However, if its long-term developmental potential is to be fully realized, more attention should be paid to

how applicants experience the program: how clearly it communicates information, how fairly it distributes burdens, and how well it supports the transition from return to contribution.

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Usage Behaviour and Satisfaction: An Empirical Analysis of Generative AI Adoption in Higher Education

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ABSTRACT

This study investigates the relationship between Generative AI (GenAI) tool usage frequency and user satisfaction among higher education faculty and students (N = 312). Faculty participants were drawn from 14 countries, while students were predominantly from Croatia. Using a multi-method analytical framework, Spearman's rank correlation, OLS regression, mixed-effects modelling, and Random Forest analysis, the study constructs composite indices of usage frequency and satisfaction alongside five perceived quality dimensions.

The findings reveal that no significant usage–satisfaction relationship exists at the aggregate level, while tool-specific analyses uncover consistently positive and significant correlations across all five tools examined, a divergence attributable to aggregation bias. A mixed-effects model further identifies a strong within-person effect among faculty ($\beta = 0.428$, $p < 0.001$), demonstrating that the usage–satisfaction relationship operates at the individual rather than the population level. Across both regression and machine learning analyses, perceived quality dimensions emerge as the primary drivers of satisfaction, accuracy for faculty, and speed and empathy for students, while usage frequency plays a comparatively limited cross-sectional role.

These findings highlight the methodological importance of analytical level selection in technology adoption research and suggest that higher education institutions should prioritize tool quality and functional fit over adoption rates when integrating GenAI into educational environments.

Keywords: Generative AI; user satisfaction; usage frequency; higher education; human–AI interaction

INTRODUCTION

Generative AI tools are increasingly being used in higher education, as confirmed by numerous literature reviews synthesizing their applications, impact on learning, as well as user attitudes and behaviours (Wu, 2025; Hon, 2025). In a systematic review of research on the application of ChatGPT in higher education, Dos (2025) highlights that most studies focus on user perceptions, technology acceptance, and user experience. The emphasis is placed on variables such as perceived usefulness and ease of use, often grounded in technology acceptance models. The author also points to a lack of research examining relationships between usage-related variables, such as frequency of use and user satisfaction. Similar findings are reported in other systematic literature reviews, which show that research on the application of generative artificial intelligence

in higher education primarily focuses on technology acceptance, usage patterns, and its potential applications in the teaching process, with particular emphasis on variables such as perceived usefulness and ease of use (Baig & Yadegaridehkordi, 2024).

In this context, some empirical studies attempt to link usage patterns with user satisfaction. Kausar et al. (2026) investigate student satisfaction with the use of ChatGPT in an educational context, analysing usage patterns as well, and their results indicate a relationship between usage and satisfaction, with an emphasis on the importance of additional factors such as engagement and perceived usefulness. However, more recent studies suggest that this relationship is not unidirectional. Fakhri et al. (2024) demonstrate that frequency of use does not have a uniformly positive effect but instead acts as a moderating factor, where higher frequency may reduce the positive impact of perception, reliability, and satisfaction on learning outcomes, indicating the complexity of the relationship between the use of generative AI tools and user satisfaction.

Furthermore, Colombari et al. (2026) show that the relationship between frequency of use and satisfaction is not direct, but that frequency operates indirectly through perceived functionality and preference for interaction with artificial intelligence. On the other hand, the study *Measuring university students' satisfaction with traditional search engines and generative AI tools as information sources* finds that frequency of use can represent a significant predictor of satisfaction, with more frequent use leading to higher levels of satisfaction (Lund et al., 2026). In contrast, the study *Generative artificial intelligence expectations and experiences in management education: ChatGPT use and student satisfaction* emphasizes that satisfaction is not directly determined by frequency of use but primarily depends on perceived quality and student expectations, with perceived quality playing an important mediating role (Suchanek & Kralova, 2025). In line with this, additional studies confirm that high frequency of use does not necessarily result in higher satisfaction, as satisfaction depends more on perceived quality, usefulness, and user experience than on usage frequency itself (Yu et al., 2024; Suchanek & Kralova, 2025).

In addition, some studies point to differences between user groups, where more experienced users often develop a more critical attitude toward generative AI tools, while less experienced users may report higher levels of satisfaction, partly due to the novelty effect. For example, users with lower levels of knowledge about artificial intelligence systems more frequently experience issues with accuracy and are less likely to actively manage dissatisfaction, indicating differences in experience and perception of the tools (Kim et al., 2023).

Although these relationships have been relatively well explored in student populations, there is significantly less research analysing frequency of use as a potential predictor of satisfaction in other user groups. Specifically, studies focusing on academic staff mainly examine satisfaction and continued use of technology, while the direct relationship between frequency of use and satisfaction remains insufficiently explored. For instance, the study *Factors influencing academic staff satisfaction and continuous usage of generative artificial intelligence (GenAI) in higher education* shows that faculty satisfaction depends on perceived usefulness, engagement, and user experience, and is associated with the intention of continued use, while frequency of use is not considered a direct predictor of satisfaction (Baig & Yadegaridehkordi, 2025).

Although recent literature includes studies comparing multiple generative AI tools, these primarily focus on differences in performance, accuracy, and functionalities, while the relationship between frequency of use and user satisfaction in a comparative multi-tool context remains underexplored. For example, Moon (2025) compares several LLM models in solving mathematical tasks, focusing on accuracy and problem-solving performance, while Boral and Kanta Mondal (2025) analyse the accuracy of responses generated by ChatGPT, Gemini, and Copilot in an educational context. Similarly, Urek et al. (2025) examine the application of ChatGPT, Gemini,

and Copilot in software development, focusing on productivity, accuracy, and usefulness of the tools.

This research direction is further extended by the study *Great Potential of Generative AI Tools in Education: A Comparative Analysis of Leading GenAI Systems*, which compares five generative AI tools: ChatGPT, Gemini, Copilot, Perplexity, and DeepSeek. The analysis was conducted based on ten criteria, including system type, database and update model, accuracy and reliability, prompt-generation speed, language performance, creativity and empathy, plug-in options, input-format recognition, output-format options, and link utilization and reference checking (Aleksić-Maslać et al., 2026). Although the aforementioned study focused on analysing the performance and functional characteristics of the tools, the same dataset served as a starting point for this research, in which the focus shifts toward analysing frequency of use and user satisfaction.

METHODOLOGY

2.1 Data collection and sample statistics

Data were collected through anonymous online surveys administered on a voluntary basis across higher education institutions. The final sample comprised N = 107 faculty members and N = 205 students (total N = 312). Faculty participants were drawn from 14 countries, while students were predominantly from Croatia. The study is quantitative in nature, and anonymity was maintained in line with established survey research practices (Creswell, 2009; Dillman et al., 2015). Faculty and students were treated as separate analytical groups due to fundamental differences in their motivations, contexts, and patterns of GenAI use. Likert-type scales were used to measure usage frequency (1 = not using at all; 5 = using extensively) and overall satisfaction (1 = very dissatisfied; 5 = very satisfied). Five additional dimensions assessed perceived tool quality: speed, accuracy, empathy, plug-in functionality, and image recognition capabilities.

2.2. Reliability and Construct Validity

Internal consistency of the five quality dimensions was assessed using Cronbach's alpha. Cronbach's alpha is widely used in social science research as the standard measure of scale reliability (Cronbach, 1951). The Cronbach's alpha yielded $\alpha = 0.759$ for faculty and $\alpha = 0.824$ for students, both exceeding the accepted threshold of 0.7 (Cronbach, 1951). The dimensions were subsequently aggregated into a composite quality index by taking their mean. This approach reduces measurement error, improves statistical stability, and lowers multicollinearity risk in subsequent models (Hair, 2019). A correlation analysis was conducted between the five quality dimensions to examine it the items share sufficient common variance to reflect a single latent construct (Hair, 2019; Nunnally, 1978). The analysis using heatmaps confirmed high intercorrelations, supporting construct validity and justifying the composite index.

To ensure external validity the survey was administered across multiple higher education institutions to increase the generalizability. A high number of observations strengthens the statistical power and reduces the probability of Type II errors (Cohen, 1988). Triangulation was employed by combining aggregate-level and tool-specific analyses, as well as complementing inferential statistical methods with a machine learning approach.

2.3. Testing Distributional Assumptions

Likert-scale responses were treated as ordinal variables, consistent with prior research (Likert, 1932; Norman, 2010; Sullivan & Artino, 2013), so normality is one of the key assumptions to test before conducting research to determine whether to use parametric or non-parametric methods.

The Shapiro-Wilk test is used as it has superior statistical power compared to alternatives particularly for small to moderate sample sizes (Razali & Wah, 2011; Shapiro & Wilk, 1965). The results indicate a statistically significant deviations from normality in all cases ($p<0.001$), which suggests that the data is not normally distributed. Accordingly, Spearman's rank correlation was selected as the primary measure of association, as it requires no normality assumption and is appropriate for ordinal data (Field, 2018; Siegel & Castellan, 1988).

2.4. Unit of Analysis and Avoidance of Pseudoreplication

A key methodological consideration of this study is the definition of the unit of analysis. Each respondent was treated as a single observation (i.e., one row per person). Each respondent was treated as a single observation to avoid pseudoreplication, which arises when multiple dependent observations from the same individual are treated as independent, artificially inflating sample size and producing misleadingly narrow confidence intervals (Hurlbert, 1984; Lazic, 2010). Since respondents evaluated multiple tools, aggregate indices of usage frequency and satisfaction were constructed at the individual level by averaging across all tools used, excluding missing values. This approach assures statistical validity and at the same time preserves the overall behavioural patterns.

2.5. The Correlation Analysis

Spearman's correlation was computed at two levels: aggregate (overall indices) and tool-specific (separate correlations per tool). The multilevel approach allows detection of relationships that may be concealed at the population level due to aggregation bias, a phenomenon where by averaging across heterogeneous groups masks genuine associations within more homogeneous subgroups (Openshaw, 1983; Robinson, 1950).

By examining both levels simultaneously, the analysis captures the full complexity of the usage-satisfaction relationship rather than reducing it to a single, potentially misleading summary statistic. It is important to note that the tool-level analysis does not constitute pseudoreplication, as each subset includes independent individuals who have used a specific GenAI tool. Effect sizes were interpreted following (Cohen, 1988), where $\rho = 0.10$ is small, $\rho = 0.30$ medium, and $\rho = 0.50$ large.

2.6. Multiple Linear Regression

As the correlation analysis only observes the existence of a relationship between two variables, it lacks in the areas of causality and the magnitude of effect. To further examine the relationship between the variables a multiple linear regression model was estimated according to the following equation:

$$Satisfaction = \beta_0 + \beta_1 Usage + \beta_2 Speed + \beta_3 Accuracy + \beta_4 Empathy + \beta_5 Features \quad (1)$$

Usage frequency served as the independent variable, with quality dimensions as controls. Residual normality was assessed via the Jarque-Bera test, multicollinearity via Variance Inflation Factors (VIF < 10), and homoscedasticity through residual-versus-fitted plots (Field, 2018; Hair, 2019).

2.7. Mixed effects model

To account for the nested structure of tool-level observations within individuals, a mixed-effects model with random intercepts per respondent was estimated on a person × tool long-format dataset such that a respondent who evaluated three tools contributes three rows to the dataset, each linked to the same person identifier. Treating such data as a flat cross-section would underestimate standard errors and inflate test statistics (Gelman & Hill, 2006). This format is used because it appropriately partitions variance into within-person effects, i.e. how a single individual's satisfaction varies across tools they use more or less frequently. Also, the between-person effects, which may be driven by stable individual differences such as general tech-savviness or prior experience.

2.8. Machine Learning Approach

A Random Forest model (500 trees; 80/20 train-test split) was applied as a complementary, assumption-free validation of the regression findings. Unlike OLS, Random Forest makes no assumptions about functional form, making it robust to nonlinearity and predictor interactions (Breiman, 2001). Permutation-based importance scores were used to rank predictors by their contribution to model performance, offering a more reliable importance measure than node-impurity metrics (Fisher et al., 2018). While regression models provide coefficient estimates under specific parametric assumptions, Random Forest is a non-parametric ensemble method that makes no assumptions about the functional form of relationships between variables, making it robust to nonlinearity and interactions among predictors (Breiman, 2001).

3. FINDINGS

3.1. Descriptive statistics

The descriptive analysis reveals moderate levels of GenAI usage and relatively high levels of satisfaction across both groups. Faculty reported an average usage frequency of 2.15 and satisfaction of 3.60, while students reported slightly lower usage (2.05) but higher satisfaction (3.80). In both groups, ChatGPT emerged as the most frequently used tool, consistent with its broader market penetration (Tlili et al., 2023).

Figure 1. presents the distribution of usage frequency and satisfaction ratings across the five GenAI tools examined for both faculty and student groups. The distributions reveal a right skew in usage frequency, indicating that most respondents cluster at lower usage levels, while satisfaction scores are more symmetrically distributed and generally higher, suggesting that even occasional users report positive experiences.

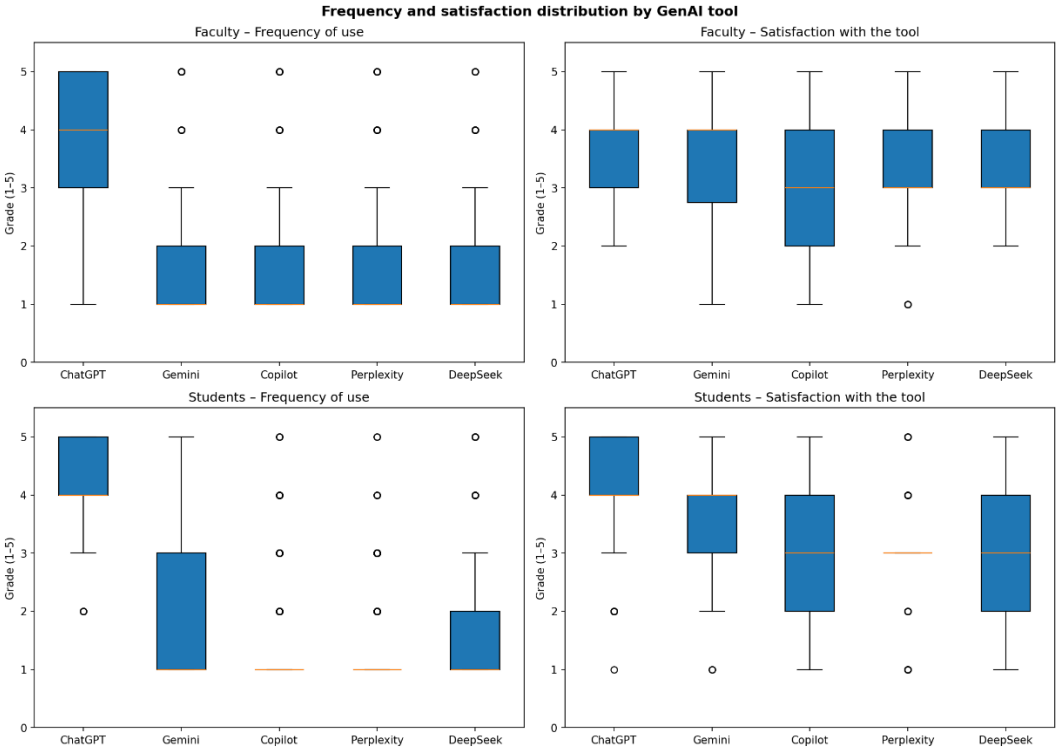


Figure 1. Frequency and satisfaction distribution by GenAI tool

3.2 Aggregate Correlation Analysis

Contrary to initial expectations, no statistically significant relationship between usage frequency and satisfaction was found at the aggregate level. Faculty yielded $\rho \approx -0.002$ and students $\rho \approx -0.10$, both non-significant. This finding suggests that, at the population level, increased usage does not necessarily translate into higher satisfaction. It also indicates that simple linear assumptions about usage-satisfaction relationships may be insufficient.

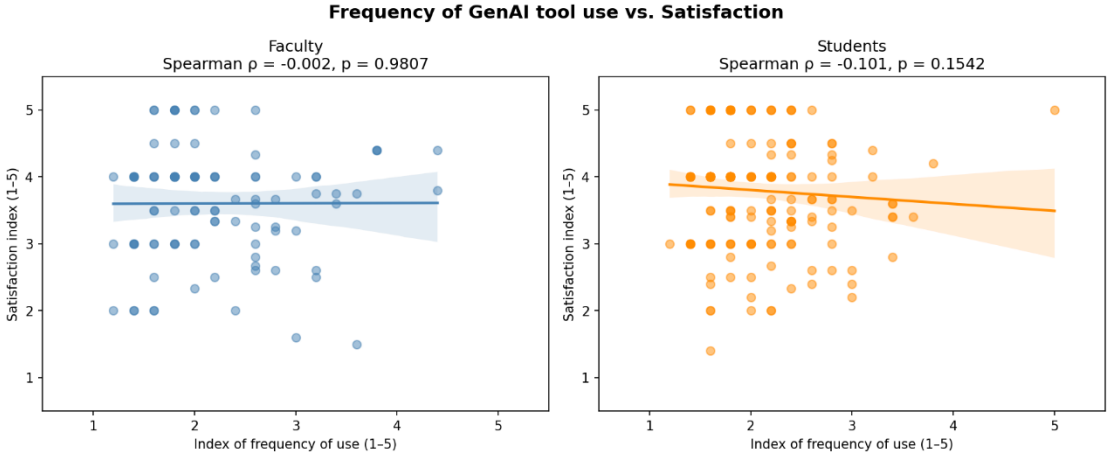


Figure 2. Scatter-plot of the Frequency of GenAI usage vs. Satisfaction

Figure 2 visually confirms this, with data points dispersed without any directional trend, a classic illustration of aggregation bias, wherein relationships at a granular level disappear when data are averaged across heterogeneous groups (Openshaw, 1983; Robinson, 1950).

3.3 Tool-Specific Correlation Analysis

In contrast, the tool-level analysis reveals consistently positive and statistically significant correlations across all GenAI tools.

As shown in the Table 1, Spearman's rank correlation coefficients (ρ) between tool-specific usage frequency and satisfaction, reported separately for faculty and students. All correlations are positive and statistically significant at the 5% level or below. For faculty, coefficients range from $\rho = 0.39$ (Gemini and DeepSeek) to $\rho = 0.57$ (ChatGPT), indicating moderate to moderately strong effects according to Cohen's (1988) benchmarks. Among students, effects are uniformly stronger, with Perplexity yielding the highest coefficient ($\rho = 0.75$), suggesting that among students who use this tool, engagement and satisfaction are very strongly coupled.

This pattern suggests that the relationship between usage and satisfaction is context-dependent, emerging clearly when analysed at the level of individual tools. These findings highlight the importance of avoiding over-aggregation, as meaningful relationships may otherwise be masked.

Table 1: Correlation by Tool for Faculty and Students

Group	Tool	ρ	p-value	Sig	n
Faculty					
	ChatGPT	+0.5654	0.0000	**	97
	Gemini	+0.3904	0.0186	*	36
	Copilot	+0.4717	0.0028	**	38
	Perplexity	+0.4940	0.0014	**	39
	DeepSeek	+0.4036	0.0162	*	35
Students					
	ChatGPT	+0.3919	0.0000	**	200
	Gemini	+0.5558	0.0000	**	82
	Copilot	+0.5001	0.0005	**	45
	Perplexity	+0.7478	0.0000	**	45
	DeepSeek	+0.5627	0.0000	**	55

3.4 Regression Analysis

The regression models demonstrate strong explanatory power ($R^2 = 0.729$ for faculty; $R^2 = 0.516$ for students), yet usage frequency is not a significant predictor in either group (faculty: $\beta = -0.056$, $p = 0.377$; students: $\beta = -0.077$, $p = 0.299$). For faculty, accuracy ($\beta = 0.417$, $p < 0.001$) and image recognition ($\beta = 0.252$, $p < 0.001$) are the strongest predictors, followed by speed and plug-in functionality. For students, speed ($\beta = 0.302$, $p < 0.001$), empathy ($\beta = 0.181$, $p = 0.002$), image recognition ($\beta = 0.148$, $p = 0.008$), and accuracy ($\beta = 0.144$, $p = 0.049$) are all significant. Perceived quality, not usage frequency, is the primary cross-sectional driver of satisfaction in both groups.

Table 2: OLS Regression Analysis Results for Faculty and Students

Variable	Faculty	Students
Constant	0.3653	0.7781**
	(0.305)	(0.285)
Frequency Index	-0.0562	-0.0771
	(0.063)	(0.074)
Satisfaction (Speed)	0.1816**	0.3023***
	(0.062)	(0.069)
Satisfaction (Accuracy)	0.4173***	0.1440*
	(0.083)	(0.073)
Satisfaction (Empathy)	0.0276	0.1813**
	(0.056)	(0.057)
Satisfaction (Plugins)	0.1346*	0.1047
	(0.062)	(0.070)
Satisfaction (Images)	0.2524***	0.1479**
	(0.063)	(0.055)
Observations	78	189
R^2	0.729	0.516
Adjusted R^2	0.706	0.500
F-statistic	31.79***	32.30***

Notes: Standard errors are reported in parentheses. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

3.5 Mixed-Effects Model Results

The mixed-effects model provides a crucial additional insight. When controlling for individual-level variability, usage frequency becomes a strong and statistically significant predictor of satisfaction ($\beta = 0.428$, $p < 0.001$) among faculty. Table 3 shows the results of the mixed-effects model estimated for the faculty sample. The random intercept captures substantial between-person variability (Group Var = 0.359), confirming that individual-level differences in baseline satisfaction are non-trivial and must be controlled for. Crucially, after accounting for this individual heterogeneity, usage frequency emerges as a strong and highly significant predictor of satisfaction ($\beta = 0.428$, $p < 0.001$). This finding reconciles the aggregate null result with the positive tool-level correlations: the usage–satisfaction relationship is a genuine within-person phenomenon, obscured at the population level by between-person heterogeneity.

Table 3: Mixed-Effects Model Results for Faculty

Variable	Coefficient
Intercept	2.084***
	(0.150)
Frequency	0.428***
	(0.038)
Group Variance	0.359
Observations	245
Number of Groups	102
Log-Likelihood	-278.654

Notes: Standard errors are reported in parentheses. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$. Model estimated using REML. Random intercepts are specified at the individual (person) level.

3.6 Machine Learning Results

The Random Forest model achieves moderate predictive performance ($R^2 \approx 0.51$ for faculty and 0.47 for students). These results closely mirror the OLS findings, providing cross-method validation. Usage frequency contributes modestly in both groups, reinforcing that quality

dimensions are the primary determinants of satisfaction. Table 4 shows in detail the results show the results of the permutation-based feature importance analysis from the Random Forest models. For faculty, image recognition (0.214) and accuracy (0.126) are the most important features, followed by plug-in functionality (0.094) and speed (0.055). For students, speed (0.207), empathy (0.136), and accuracy (0.127) dominate.

Table 4: Random Forest Results for Faculty and Students

	Faculty		Students	
Feature	**Importance**	**Std. Dev.**	**Importance**	**Std. Dev.**
Images	0.2143	0.1137	0.0675	0.0319
Accuracy	0.1257	0.0632	0.1270	0.0726
Plugins	0.0941	0.0497	0.0306	0.0381
Speed	0.0554	0.0766	0.2074	0.0782
ChatGPT	0.0544	0.0288	0.0212	0.0125
Empathy	0.0379	0.0212	0.1360	0.0621
Copilot	0.0058	0.0049	-0.0053	0.0029
Gemini	-0.0025	0.0032	0.0082	0.0192
Perplexity	-0.0051	0.0051	0.0027	0.0038
DeepSeek	-0.0116	0.0308	0.0030	0.0075
Model performance: $R^2_{\text{test}} = 0.5109$ (Faculty), 0.4677 (Students)				

Furthermore, Random Forest analysis helped assess feature importance for each group by measuring the degree to which randomly permuting each predictor's values degrades out-of-sample predictive accuracy. As shown in Figure 3, the bar chart for faculty visually confirms the dominance of image recognition and accuracy as satisfaction drivers, with a sharp drop in importance for the remaining variables.

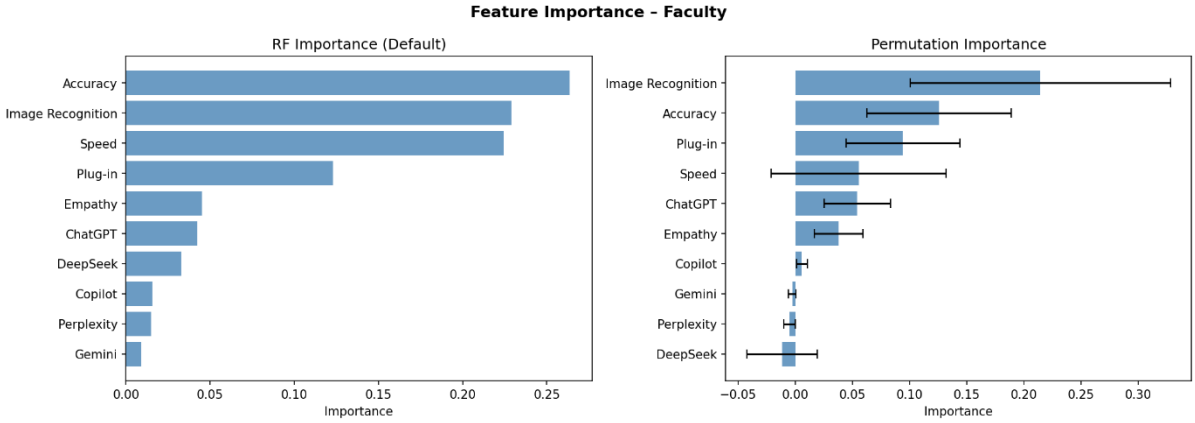


Figure 3. Feature importance — Faculty

Similarly, Figure 4. illustrates that for students the importance profile shifts toward speed and empathy, reflecting different priorities in tool evaluation across the two populations. Students appear to weight responsiveness and perceived understanding more heavily than the functional accuracy dimensions that dominate faculty preferences.

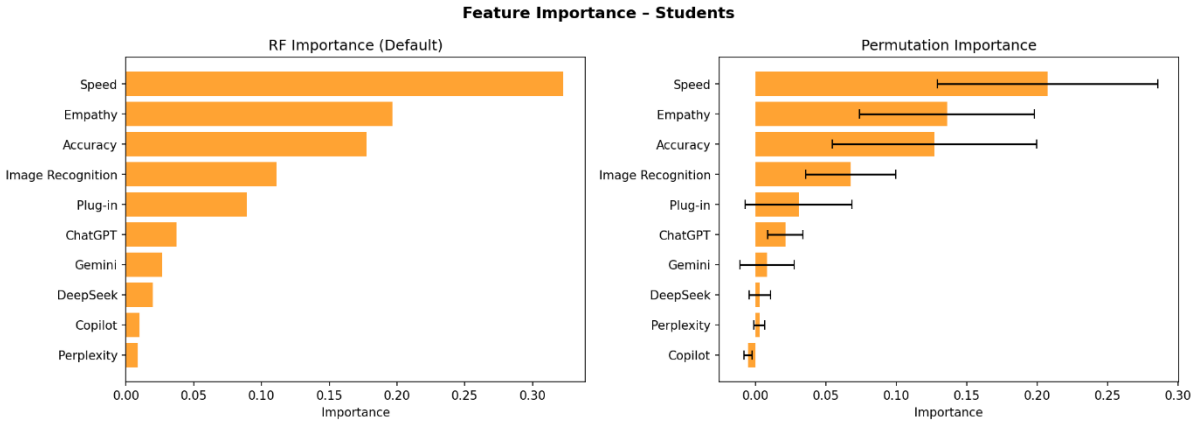


Figure 4. Feature Importance — Students

4. CONCLUSION

Although the premise of this research may initially appear straightforward, the findings reveal a nuanced and methodologically instructive picture of the GenAI usage–satisfaction relationship in higher education. Rather than exhibiting a simple linear association, this relationship proves highly sensitive to the level of analysis at which it is examined.

At the aggregate level, no significant association between usage frequency and satisfaction was detected for either faculty or students, suggesting that frequency of use alone does not predict satisfaction. However, tool-specific analyses uncover consistently positive and significant correlations across all five tools, with moderate to large effect sizes — particularly among students, where Perplexity yields $\rho = 0.75$. This divergence reflects aggregation bias, wherein relationships present within homogeneous subgroups are obscured when data are pooled across a heterogeneous population (Openshaw, 1983; Robinson, 1950). The results underscore that the choice of analytical level is not merely a technical decision but one that can fundamentally alter research conclusions.

The mixed-effects model resolves this tension most decisively. By partitioning variance into within-person and between-person components, it identifies a strong within-person effect among faculty ($\beta = 0.428$, $p < 0.001$): increased engagement with a specific tool is associated with higher satisfaction when stable individual differences in baseline satisfaction are controlled for. This finding aligns with the Technology Acceptance Model (Davis, 1989), which posits that continued use fosters familiarity and perceived usefulness, a dynamic that is inherently within-person and detectable only through analytical designs that account for individual-level heterogeneity.

Across both regression and machine learning analyses, perceived quality dimensions consistently emerge as stronger predictors of satisfaction than usage frequency. For faculty, accuracy and image recognition are the dominant drivers, reflecting the demands of research and content preparation contexts where output correctness carries direct professional consequences. Students weight speed and empathy more heavily, consistent with task-oriented, deadline-driven usage patterns. These group differences resonate with prior research demonstrating that satisfaction with AI systems is multidimensional and context-dependent (Venkatesh et al., 2003). The convergence of OLS and Random Forest results across both groups provides robust cross-method validation of these conclusions.

The dominance of quality over usage frequency carries important practical implications. Institutional strategies focused on increasing GenAI adoption rates are unlikely to improve satisfaction unless the tools meet user expectations in terms of performance. Satisfaction must be

earned through demonstrated utility rather than mere familiarity, partially challenging diffusion-based assumptions that increased use naturally produces more favourable evaluations (Rogers, 2003). Administrators and educational technologists should therefore prioritize tool quality and functional fit over adoption metrics when selecting and deploying GenAI solutions in educational settings.

Several limitations must be acknowledged. The cross-sectional design precludes causal inference; it remains plausible that more satisfied users self-select into more frequent use, rather than the reverse. Self-reported measures introduce potential response bias, subgroup sample sizes vary across tools, and important satisfaction determinants such as privacy concerns, ethical perceptions, and institutional support were not captured in the measurement instrument. While faculty represent an internationally diverse sample (14 countries), the student sample is predominantly Croatian, which limits the geographic generalizability of findings for that group.

Theoretically, the findings suggest that the usage–satisfaction relationship in GenAI contexts should be conceptualized as a within-person dynamic, requiring mixed-effects or longitudinal designs to detect reliably. This has broader implications for how technology adoption studies in educational settings are designed and interpreted, particularly when individuals interact with multiple tools simultaneously. Practically, higher education institutions should prioritize the quality and functional fit of GenAI tools over adoption rates, tailoring tool selection to the distinct needs of faculty and student populations to maximize satisfaction and effective integration.

Future research should employ longitudinal designs to establish causal direction between usage and satisfaction and expand geographic scope to enable cross-cultural comparisons of GenAI adoption patterns. Qualitative methods such as interviews or think-aloud protocols would deepen understanding of how users form satisfaction judgments and which quality dimensions are most experientially salient. Additional work examining moderating variables, including digital literacy, disciplinary background, prior AI experience, and institutional culture, would further illuminate the conditions under which GenAI tools are most effectively adopted and evaluated in higher education contexts. As the GenAI landscape continues to evolve rapidly, future studies should also incorporate emerging tools and update measurement instruments accordingly to ensure continued empirical relevance.

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Digitalization and the Management of Returned State Assets in Kazakhstan: Transparency, Trust, and Emerging Governance Reform

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ABSTRACT

Digital transformation has become a key instrument for improving transparency, accountability, and institutional trust in public administration. In Kazakhstan, the adoption of the Law on the Return of Illegally Acquired Assets (2023) and the implementation of digital governance initiatives, particularly the E-Qazyna platform, represent significant reforms aimed at strengthening the transparent management of recovered state assets. However, while considerable attention has been devoted to asset recovery, relatively little empirical research has examined whether digitalization enhances transparency and fosters trust among business stakeholders during the post-recovery management process. This study addresses this gap by investigating how digital governance influences transparency and institutional trust in Kazakhstan's returned state asset management system. Guided by Principal–Agent Theory and Institutional Trust Theory, the research adopts a qualitative interpretivist approach using semi-structured interviews with government officials, digital governance experts, and representatives of the business community. The study explores stakeholder perceptions of transparency, the effectiveness of digital governance tools in reducing information asymmetry, and the institutional factors that facilitate or hinder trust in government. The findings are expected to demonstrate that digital platforms can improve transparency by increasing access to information and standardizing administrative processes; however, technology alone is insufficient to strengthen institutional trust without reliable data, effective accountability mechanisms, and meaningful stakeholder engagement. By examining the interaction between digitalization, transparency, and business trust in the context of returned state asset management, the study contributes to the literature on digital governance and public administration while providing practical recommendations for policymakers seeking to improve governance quality and institutional credibility in Kazakhstan and other transitional economies.

Keywords: digital governance; transparency; institutional trust; returned state assets; E-Qazyna; Kazakhstan; public administration; asset recovery.

INTRODUCTION

1.1 Background of the study

Over the past two decades, governments around the world have increasingly embraced digital transformation as a strategic instrument for improving the quality of public administration. Digital

technologies are no longer viewed merely as tools for automating administrative procedures; instead, they have become essential mechanisms for enhancing transparency, accountability, and public trust in government institutions. As public expectations regarding openness and efficiency continue to grow, governments are under increasing pressure to modernize governance systems and ensure that public resources are managed in a transparent and accountable manner. Consequently, digital governance has become one of the central pillars of contemporary public sector reform, particularly in countries seeking to strengthen institutional capacity and improve the relationship between the state, citizens, and the business community.

The growing importance of digital governance is particularly evident in developing and transitional economies, where institutional reforms are frequently accompanied by efforts to reduce corruption, improve administrative efficiency, and strengthen public confidence in government. International organizations such as the Organisation for Economic Co-operation and Development (OECD), the World Bank, and the United Nations Department of Economic and Social Affairs (UN DESA) consistently emphasize that digital government initiatives contribute to better governance by increasing the accessibility of public information, facilitating accountability, and creating opportunities for citizen participation. However, these organizations also acknowledge that digitalization alone cannot guarantee improvements in governance quality. The effectiveness of digital transformation depends on the institutional environment in which technological solutions are implemented, including the existence of transparent procedures, reliable data management, and effective accountability mechanisms.

Within this broader context, Kazakhstan has actively pursued an ambitious digital transformation agenda over the last decade. Through initiatives such as the *Digital Kazakhstan* program, the government has significantly expanded electronic public services, integrated digital platforms into administrative processes, and strengthened the country's digital infrastructure. These reforms have contributed to Kazakhstan's improved international standing in digital government development and demonstrate the state's commitment to modernization and innovation in public administration. Nevertheless, despite substantial technological progress, important governance challenges remain. Public discussions continue to focus on issues of institutional transparency, administrative accountability, and public trust, particularly in areas involving significant financial resources and politically sensitive decision-making.

One of the most important governance reforms undertaken in Kazakhstan in recent years concerns the recovery and management of illegally acquired state assets. Following the adoption of the *Law on the Return of Illegally Acquired Assets* in 2023, the government initiated an extensive process aimed at recovering assets that had been illegally transferred abroad or acquired through corrupt practices. Since then, billions of dollars worth of assets -including financial resources, land, real estate, corporate shares, and other strategic properties - have been returned to state ownership. This initiative represents one of the most significant anti-corruption and governance reforms in the country's recent history and reflects broader efforts to restore public confidence in state institutions while ensuring that recovered assets contribute to national economic development.

However, the successful recovery of assets represents only the first stage of a much broader governance process. Recovering assets does not automatically ensure that they will be managed efficiently, transparently, or in the public interest. On the contrary, the post-recovery phase introduces new governance challenges associated with asset valuation, ownership transfer,

allocation procedures, public oversight, and long-term management. Without effective institutional safeguards, returned assets remain vulnerable to inefficient administration, political influence, discretionary decision-making, and renewed corruption risks. Consequently, the question of **how** these assets are managed becomes as important as the process of recovering them.

These governance challenges are particularly relevant for the private sector. Businesses and investors rely on transparent institutional environments when making investment decisions, establishing partnerships, and assessing economic risks. Access to reliable information regarding state-owned assets, privatization procedures, and government decision-making contributes to greater market predictability and reduces uncertainty for economic actors. Conversely, limited transparency and fragmented information may reinforce perceptions of institutional opacity, discourage investment, and weaken trust between the government and the business community. In this respect, transparency should not be viewed solely as a normative principle of good governance but also as an important economic factor influencing the country's investment climate and long-term competitiveness.

Recognizing these challenges, Kazakhstan has increasingly incorporated digital technologies into the management of returned state assets. Digital platforms, particularly the **E-Qazyna** system, have been introduced to improve the registration, monitoring, and administration of recovered assets by providing centralized access to relevant information and supporting more standardized administrative procedures. Such initiatives reflect a broader international trend toward the use of digital governance tools to strengthen institutional transparency and reduce information asymmetry between government institutions and external stakeholders. Nevertheless, the existence of digital platforms does not necessarily guarantee meaningful transparency. The effectiveness of these systems depends not only on technological functionality but also on the quality, completeness, accessibility, and credibility of the information they provide, as well as on the broader institutional framework within which they operate.

Despite the growing international literature on digital government, transparency, and institutional trust, relatively little attention has been devoted to understanding how digitalization influences the management of returned state assets, particularly within transitional economies such as Kazakhstan. Existing research primarily focuses on digital public services, open government data, or anti-corruption initiatives in general, while the governance of recovered assets remains insufficiently explored. Moreover, few studies examine how digital transparency mechanisms shape business perceptions of government accountability and institutional trust in politically sensitive policy domains.

Against this background, the present study investigates the relationship between digitalization, transparency, and business trust within Kazakhstan's system of returned state asset management. By examining the perceptions of key stakeholders involved in digital governance and asset management, the research seeks to determine whether digitalization contributes to greater transparency and whether enhanced transparency strengthens trust between government institutions and the private sector. In doing so, the study aims to contribute both to the academic literature on digital governance and to practical policy discussions concerning the future development of transparent and accountable public administration in Kazakhstan.

1.2 Problem Statement

The recovery of illegally acquired assets has become one of the most significant governance reforms undertaken by the Republic of Kazakhstan in recent years. Since the adoption of the *Law on the Return of Illegally Acquired Assets* in 2023, the government has initiated extensive efforts to identify, recover, and reintegrate assets that were previously transferred abroad or accumulated through unlawful activities. While these initiatives represent an important step toward strengthening the rule of law and restoring public confidence in state institutions, they also introduce a new set of governance challenges that extend beyond the recovery process itself.

Although considerable political attention has been devoted to the successful return of assets, significantly less attention has been given to the question of how these assets should be managed after recovery. Asset recovery alone does not automatically generate public value or strengthen institutional legitimacy. Instead, the effectiveness of this reform depends largely on whether recovered assets are administered in a transparent, accountable, and economically efficient manner. In the absence of effective governance mechanisms, returned assets remain vulnerable to inefficient allocation, discretionary decision-making, institutional fragmentation, and renewed corruption risks. Consequently, the post-recovery management stage has emerged as a critical area requiring both academic investigation and practical policy development.

One of the principal challenges associated with returned asset management is the persistence of information asymmetry between government institutions and external stakeholders. Public authorities possess extensive information regarding the valuation, allocation, utilization, and disposal of recovered assets, whereas businesses, investors, and civil society organizations often have only limited access to this information. Such asymmetry reduces the ability of external actors to monitor government decisions, evaluate institutional performance, and assess whether public resources are managed in accordance with principles of transparency and accountability. As a result, uncertainty surrounding government decision-making may undermine confidence in public institutions and discourage constructive cooperation between the state and the private sector.

Digital governance has increasingly been promoted as a mechanism for addressing these challenges. Through the implementation of integrated digital platforms, governments can improve information accessibility, facilitate real-time monitoring, standardize administrative procedures, and enhance institutional accountability. In Kazakhstan, the introduction of digital initiatives such as the **E-Qazyna** platform represents an important attempt to modernize the management of returned state assets by improving data availability and increasing procedural transparency. Nevertheless, the mere existence of digital technologies does not necessarily guarantee greater openness or stronger institutional trust. Digital platforms may improve administrative efficiency while simultaneously failing to provide information that is sufficiently comprehensive, timely, accessible, or understandable for external stakeholders.

Furthermore, transparency should not be understood solely as the publication of information. Effective transparency requires that information be reliable, regularly updated, easily accessible, and presented in a manner that enables meaningful public oversight. Where digital systems lack interoperability, contain incomplete data, or operate without effective accountability mechanisms, technological modernization may have only a limited impact on public perceptions of government

integrity. Consequently, digitalization should be viewed as one component of broader institutional reform rather than as an independent solution to governance challenges.

An additional challenge concerns the relationship between digital transparency and business trust. Existing studies generally recognize that transparent institutions contribute to more predictable investment environments and improve confidence among economic actors. However, most empirical research examines these relationships within the context of general e-government services, open government initiatives, or anti-corruption policies. Comparatively little attention has been devoted to politically sensitive governance domains involving the management of recovered state assets. This represents an important gap in both public administration and digital governance literature, particularly within transitional economies where institutional trust has historically been affected by perceptions of corruption, selective law enforcement, and limited government transparency.

In the context of Kazakhstan, this knowledge gap is especially significant. The country has invested considerable resources in digital transformation and public sector modernization while simultaneously implementing one of the largest asset recovery initiatives in its history. However, there remains limited empirical evidence regarding whether digital governance mechanisms actually influence business perceptions of transparency, accountability, and institutional trust within the asset management process. Without such evidence, policymakers may face difficulties in evaluating whether current digital reforms effectively achieve their intended governance objectives.

Therefore, the central research problem addressed in this thesis is the insufficient understanding of how digitalization influences transparency and business trust within Kazakhstan's returned state asset management system. Specifically, while digital platforms are expected to reduce information asymmetry and improve accountability, it remains unclear whether these technological reforms genuinely increase institutional transparency from the perspective of business stakeholders. Addressing this problem is essential not only for advancing academic knowledge in the fields of digital governance and public administration but also for informing future policy decisions aimed at strengthening transparent and accountable management of returned state assets in Kazakhstan.

1.3 Research Aim

The primary aim of this study is to examine how the digitalization of returned state asset management processes influences transparency, accountability, and institutional trust between the Government of Kazakhstan and the business community. More specifically, the study seeks to investigate whether digital governance mechanisms contribute to reducing information asymmetry, increasing transparency in asset management, and strengthening business confidence in government institutions responsible for managing recovered assets.

By focusing on the interaction between digital governance and institutional trust, the research aims to provide a comprehensive understanding of how technological innovations can improve governance quality within politically sensitive areas of public administration. Furthermore, the

study seeks to identify institutional conditions under which digitalization contributes to meaningful transparency rather than merely automating existing administrative procedures.

1.4 Research question

To achieve the research aim, the study addresses the following primary research question:

How does the digitalization of returned state asset management processes influence transparency and institutional trust between the Government of Kazakhstan and the business community?

To support the primary research question, the following sub-questions are examined:

1. How do business representatives and governance experts perceive the current level of transparency in Kazakhstan's returned asset management system?
2. What role do digital governance tools, particularly the E-Qazyna platform, play in improving access to information regarding recovered state assets?
3. To what extent does digitalization reduce information asymmetry between government institutions and business stakeholders?
4. What institutional factors facilitate or hinder the development of business trust in digitally managed asset recovery processes?
5. What policy recommendations can strengthen transparency, accountability, and trust through further digitalization of returned state asset management?

1.5 Research objective

To answer these research questions, the study pursues the following objectives:

- To examine the theoretical relationship between digital governance, transparency, accountability, and institutional trust within public administration.
- To analyze the current system of returned state asset management in Kazakhstan and identify its key governance challenges.
- To evaluate the role of digital governance initiatives, including the E-Qazyna platform, in supporting transparent asset management.
- To explore the perceptions of government officials, digital governance experts, and business representatives regarding transparency and trust in the management of returned state assets.
- To identify the opportunities and limitations of digitalization in reducing information asymmetry between government institutions and external stakeholders.
- To formulate evidence-based policy recommendations aimed at improving transparency, accountability, and institutional trust within Kazakhstan's returned asset management system.

The achievement of these objectives will provide both theoretical and practical insights into the role of digital governance in strengthening institutional performance. Furthermore, the objectives establish a clear analytical framework that guides the subsequent literature review, methodological design, empirical analysis, and discussion presented in this thesis.

1.6 Significance of the study

This study is expected to make several important contributions to the fields of public administration, digital governance, and institutional trust. Its significance extends beyond the specific case of Kazakhstan by addressing broader questions concerning the role of digital transformation in improving governance quality within transitional economies.

From a theoretical perspective, the study contributes to the growing body of literature examining the relationship between digital governance and institutional trust. Existing research has primarily focused on digital public services, e-government initiatives, and open government data as mechanisms for improving administrative efficiency and citizen engagement. Comparatively little attention has been devoted to the governance of returned state assets, despite the political sensitivity and economic significance of this policy area. By integrating Principal-Agent Theory with Institutional Trust Theory, the research offers a comprehensive analytical framework for explaining how digitalization influences transparency and trust through the reduction of information asymmetry.

The study also contributes to the literature by extending discussions of digital governance into the context of asset recovery and post-recovery management. While previous studies have examined anti-corruption reforms and public sector digitalization independently, relatively few have explored the interaction between these processes within transitional economies. Consequently, this research fills an important gap by examining how digital transparency mechanisms influence business perceptions of government accountability in a governance environment characterized by institutional transformation.

From a practical perspective, the findings may provide valuable recommendations for policymakers responsible for designing and implementing digital governance reforms in Kazakhstan. Understanding how businesses perceive transparency within returned asset management can help public institutions identify weaknesses in existing digital systems and improve mechanisms for information disclosure, accountability, and stakeholder engagement. The study may therefore support the further development of digital platforms such as E-Qazyna by identifying institutional features that strengthen credibility and public confidence.

The research is also relevant for the private sector. A transparent and predictable system of asset management reduces uncertainty for investors, improves confidence in public institutions, and contributes to a more stable business environment. By identifying the factors that influence business trust, the study may assist both public authorities and private stakeholders in developing more cooperative and transparent relationships that encourage long-term investment and economic development.

Finally, the study has broader policy relevance for other transitional economies undertaking similar governance reforms. Many countries continue to face challenges associated with

corruption, institutional legitimacy, and the transparent management of public resources. The experience of Kazakhstan provides an opportunity to examine how digital governance can support institutional modernization while simultaneously strengthening accountability and trust. Consequently, the findings may contribute to comparative discussions on digital transformation and public sector governance beyond the national context.

1.7 Scope of the study

The scope of this study is limited to examining the role of digitalization in the management of returned state assets in the Republic of Kazakhstan and its influence on transparency, accountability, and business trust in government institutions. Rather than evaluating the legal effectiveness of asset recovery or measuring the economic value of recovered assets, the research focuses on governance processes that occur after assets have been returned to state ownership. Particular attention is given to the extent to which digital governance mechanisms contribute to more transparent management practices and improve relationships between public institutions and the private sector.

The study is geographically limited to Kazakhstan. This focus is justified by the country's recent institutional reforms, including the adoption of the *Law on the Return of Illegally Acquired Assets* in 2023 and the implementation of digital governance initiatives designed to improve the administration of recovered state assets. These reforms provide an appropriate empirical context for examining the relationship between digital transformation and institutional trust within a transitional economy undergoing significant governance changes.

The research concentrates on digital governance tools associated with returned asset management, with particular attention given to the **E-Qazyna** digital platform and other institutional mechanisms supporting transparency in public asset administration. Although international examples, including Estonia's X-Road system, Singapore's GovTech initiatives, and Ukraine's Prozorro platform, are discussed throughout the literature review, they are used exclusively as comparative reference cases rather than primary units of analysis. The empirical investigation remains focused on Kazakhstan.

The target population of the study consists of individuals possessing professional knowledge and practical experience related to returned asset management, digital governance, and institutional transparency. Data are collected through semi-structured interviews with representatives of government institutions involved in asset management, experts in digital governance, and business stakeholders familiar with public sector reforms. The study does not seek to measure public opinion among the general population, as its objective is to obtain in-depth insights from participants directly engaged with governance processes.

Methodologically, the research adopts a qualitative interpretivist approach. The analysis is based on participants' perceptions, experiences, and professional judgments regarding the effectiveness of digital governance mechanisms in promoting transparency and trust. Consequently, the findings are intended to provide analytical rather than statistical generalizations. While the study identifies broader governance patterns and institutional challenges, its conclusions should be interpreted within the specific political, legal, and administrative context of Kazakhstan.

Finally, the temporal scope of the research primarily covers developments between **2023 and 2026**, corresponding to the introduction of Kazakhstan's asset recovery legislation and the subsequent implementation of digital governance reforms. Earlier studies and theoretical literature are incorporated where necessary to establish the conceptual foundations of the research and provide historical context for the evolution of digital governance, institutional trust, and transparency.

METHODOLOGY

2.1. Research Design

This study adopts a qualitative research design to explore how digital governance influences transparency and business trust in the management of returned state assets in Kazakhstan. A qualitative approach was selected because the research seeks to understand participants experiences, perceptions, and professional opinions rather than measure relationships between variables statistically. The study is based on an interpretivist research paradigm, which assumes that reality is socially constructed and that individuals may interpret the same governance processes differently depending on their professional experience and institutional context. This philosophical position is appropriate because the research focuses on the perceptions of government officials, digital governance experts, and professionals directly involved in the management of returned state assets.

An inductive research approach was employed, allowing themes and patterns to emerge from the interview data rather than testing predetermined hypotheses. This approach is particularly suitable for exploring an area where limited empirical research currently exists. The findings were interpreted in relation to the theoretical concepts discussed in Chapter Two, including digital governance, transparency, institutional trust, and Principal–Agent Theory.

The research uses a qualitative case study focusing on Kazakhstan. Kazakhstan was selected because of its recent institutional reforms related to the return and management of illegally acquired assets, as well as the introduction of digital platforms such as E-Qazyna. Examining this case provides an opportunity to understand how digital governance is perceived in practice within a rapidly developing institutional environment.

2.2 Research Participants and Sampling

This study employed purposive sampling, a non-probability sampling technique commonly used in qualitative research to select participants with relevant knowledge and professional experience. This approach enabled the researcher to obtain rich and detailed insights from individuals directly involved in digital governance and the management of returned state assets.

A total of seven semi-structured interviews were conducted with professionals representing organizations responsible for the management, digitalization, and implementation of returned state asset policies in Kazakhstan. Participants included managers and specialists from the Returned Asset Management Company LLP (KUVA) and a digital governance expert from Samruk-Kazyna. The participants were selected because of their direct involvement in

asset management, digital platforms, public administration, and institutional decision-making.
The sample included respondents occupying different managerial and operational positions, allowing the study to capture perspectives from both strategic and practical levels of governance. Such diversity contributed to a broader understanding of how digital governance influences transparency and business trust within the asset management process.
The number of participants was considered sufficient because data saturation was achieved. Similar themes and patterns began to recur across the interviews, indicating that additional interviews were unlikely to generate substantially new information. This supports the credibility of the findings and is consistent with qualitative research principles.

2.3 Data collection

Data were collected through semi-structured interviews, which were selected as the primary data collection method because they provide flexibility while ensuring that all participants address the same key topics. This method allowed respondents to share their professional experiences and perspectives regarding digital governance, transparency, accountability, and business trust in the management of returned state assets.
An interview guide consisting of open-ended questions was developed based on the research objectives and the literature reviewed in Chapter Two. The questions focused on five main areas: (1) participants' professional roles and experience, (2) the impact of digitalization on transparency, (3) business trust and institutional factors, (4) interagency coordination and data exchange, and (5) recommendations for improving digital governance in Kazakhstan. A total of ten interviews were conducted with professionals from the Returned Asset Management Company LLP (KUVA) and Samruk-Kazyna. Each interview lasted approximately 20-35 minutes. Interviews were conducted in Russian, as this was the preferred working language of the participants, allowing them to express their views more freely and accurately. With participants' consent, interview responses were recorded in written form and subsequently transcribed for analysis. To ensure consistency, all participants were asked the same core questions, while additional follow-up questions were used where clarification or further explanation was required. The collected interview transcripts constituted the primary source of empirical data for this study and formed the basis for the thematic analysis presented in Chapter Four.

2.4. Data Analysis

The interview data were analyzed using thematic analysis, following the six-phase framework developed by Braun and Clarke (2006). This method was selected because it enables the systematic identification, organization, and interpretation of recurring patterns within qualitative data.

The analysis began with repeated reading of the interview transcripts to achieve familiarity with the data. Initial codes were then assigned to meaningful segments of text related to the research objectives, including digital governance, transparency, business trust, interagency coordination, and institutional challenges. Similar codes were grouped into broader categories, which were subsequently refined into overarching themes.
The coding process was conducted manually by the researcher to ensure a close engagement with the data and a deeper understanding of participants; perspectives. The final themes were developed

through continuous comparison across all interview transcripts and were later interpreted in relation to the theoretical framework presented in Chapter Two.
The thematic analysis enabled the researcher to identify common patterns as well as differences in participants; perceptions, providing a comprehensive understanding of how digital governance influences transparency and business trust in the management of returned state assets in Kazakhstan.

RESULTS

The findings are organized into five main themes that emerged during the coding process.
These themes reflect participants perceptions of the role of digital governance in improving transparency, strengthening business trust, addressing institutional challenges, and supporting the future development of digital solutions for returned state asset management.
To ensure the credibility of the analysis, selected quotations from the interviews are presented throughout the chapter to illustrate the views expressed by participants. Respondents are identified using participant codes (e.g., P1, P2, P3) to maintain consistency throughout the analysis.

3.1. Theme 1: Digital Governance as a Driver of Transparency

One of the most prominent themes emerging from the interviews was the perception that digital governance has significantly enhanced transparency in the management of returned state assets. All participants agreed that digital technologies have made asset management procedures more open, reduced manual intervention, and increased public access to information.
Several participants emphasized that the introduction of the E-Qazyna platform has improved the transparency of electronic auctions by providing equal access to all potential participants.
As one respondent explained: all auctions are conducted electronically, and every participant has equal access to information and the opportunity to participate under the same conditions. (P2)
This statement illustrates that participants associate transparency not only with the publication of information but also with procedural fairness. Equal access to auction information was perceived as reducing opportunities for preferential treatment and increasing confidence in the process.
Another participant highlighted that digitalization minimizes the influence of the human factor:
The system minimizes manual intervention because every stage of the process is recorded electronically.
Participants repeatedly associated automation with greater objectivity in administrative decision-making. According to their responses, digital platforms improve transparency by ensuring that decisions are documented and can be verified if necessary.
However, respondents also emphasized that transparency should not be understood solely as the availability of digital technologies. One participant explained that transparency depends on how information is presented and whether it is accessible and understandable for users:
Transparency is achieved when information is complete, reliable, and available to everyone who needs it. This finding indicates that participants perceive transparency as a broader governance

principle rather than simply a technological feature. Overall, the interviews demonstrate that digital governance has substantially improved transparency in Kazakhstan and returned state asset management system by increasing access to
information, reducing manual intervention, and promoting equal participation in electronic procedures.

3.2. Theme 2: Transparency as a Foundation for Business Trust

Another major theme identified across the interviews was the relationship between transparency and business trust. While participants acknowledged the importance of digital technologies, they consistently emphasized that trust is built through transparent procedures, equal opportunities, and predictable governance rather than technology alone.

Most respondents agreed that the introduction of digital platforms has increased business confidence by making the asset management process more open and objective. According to one participant, the E-Qazyna platform ensures transparent auction procedures by providing equal conditions for all participants and eliminating discrimination during the selection process.

One respondent stated:

The E-Qazyna portal ensures openness and transparency of auctions and tenders. All interested parties can participate under equal conditions, which eliminates discrimination and guarantees equal access. This response suggests that businesses are more likely to trust government institutions when administrative procedures are standardized and applied consistently to all participants. Equal access to information and electronic auctions was repeatedly described as an important factor reducing uncertainty and increasing confidence in public administration.

A similar perspective was expressed by another participant, who noted that digitalization contributes to trust because electronic procedures ensure objectivity throughout the auction process.

The E-Qazyna portal guarantees transparent auction procedures, ensuring their objectivity and openness. Everyone has the opportunity to participate under equal conditions without unnecessary risks.

Participants therefore associated trust not only with transparency but also with procedural fairness. Respondents explained that businesses are more willing to participate in state auctions when they believe that decisions are made according to clear rules rather than personal discretion.

At the same time, several interviewees emphasized that transparency alone is insufficient if it is not supported by effective communication between institutions and society. One participant explained that the organization regularly publishes information through its official website, social media platforms, and mass media to keep the public informed about its activities.

This finding indicates that business trust depends on continuous access to reliable information rather than occasional disclosure. Participants viewed communication as an essential component of transparency because it enables stakeholders to better understand institutional decisions and monitor government activities.

Overall, the interviews demonstrate that transparency serves as the primary mechanism through which digital governance strengthens business trust. Rather than viewing trust as a direct consequence of digitalization, participants consistently linked it to open procedures, equal treatment, and continuous communication between public institutions and stakeholders.

3.3. Theme 3: Challenges of Interagency Coordination and Data Integration

Although participants generally evaluated Kazakhstan& digital governance reforms positively, the interviews also identified several institutional challenges that continue to affect the effectiveness of digital governance. Unlike the previous themes, which focused primarily on the positive outcomes of digitalization, this theme highlights the practical difficulties encountered during the implementation of digital reforms.

Most respondents agreed that the existing digital infrastructure has significantly improved administrative processes. However, several participants pointed out that effective digital Governance requires continuous coordination between institutions, standardized procedures, and reliable information exchange. One participant explained that cooperation between government institutions is carried out in accordance with existing legislation and established administrative procedures.

Another respondent emphasized that the implementation of digital governance depends not only on technological solutions but also on effective institutional cooperation. Digital platforms facilitate information exchange, yet successful governance requires coordination among multiple public organizations responsible for different stages of asset management. Participants also discussed the importance of maintaining a unified digital environment.

Several respondents highlighted that E-Qazyna functions as the central platform for asset management, reducing fragmentation by concentrating major administrative procedures within a single digital system. Nevertheless, they acknowledged that further integration between government information systems could improve efficiency and reduce administrative complexity.

Unlike many studies that emphasize technical barriers, respondents rarely identified significant technological obstacles. Instead, they described the current challenges as organizational and institutional, suggesting that future improvements should focus on strengthening coordination, data exchange, and interoperability among public institutions.

Overall, the findings indicate that Kazakhstan has established a solid digital infrastructure for managing returned state assets. However, participants believe that continued institutional cooperation and further integration of government information systems are necessary to maximize the long-term benefits of digital governance.

3.4. Theme 4: Data Quality and System Reliability as Determinants of Trust

Another important theme identified during the analysis was the significance of data quality and system reliability. Participants consistently argued that the effectiveness of digital governance depends not only on the existence of digital platforms but also on the accuracy, completeness, and reliability of the information they provide.

Several respondents emphasized that reliable data are essential for maintaining trust among businesses and other stakeholders. One participant noted that any system failure or inaccurate information may be perceived as an attempt to manipulate the process, thereby reducing confidence in public institutions (P1). Similarly, another respondent explained that stable platform performance and access to complete documentation increase participants willingness to engage in electronic auctions.

Participants also highlighted the importance of system stability during auction procedures. Technical failures, delays, or interruptions were viewed as factors that could undermine confidence, even if the procedures themselves were conducted fairly. One respondent stated that

stable operation of the E-Qazyna platform is particularly important during electronic auctions, as any disruption may raise doubts about the transparency of the process (P5).

The interview with the representative of Samruk-Kazyna further demonstrated that data quality represents a strategic issue for digital governance. According to the participant, digital systems can support effective decision-making only when they are based on standardized, accurate, and comparable data. The respondent also emphasized the growing importance of transparent algorithms and explainable artificial intelligence, arguing that users are more likely to trust digital systems when they understand how recommendations and decisions are generated (P7).

Overall, participants agreed that digital governance cannot function effectively without reliable data and stable digital infrastructure. High-quality information and dependable digital systems were consistently identified as essential conditions for strengthening transparency, accountability, and business trust.

3.5. Theme 5: Recommendations for Strengthening Digital Governance

The final theme focused on participants recommendations for improving digital governance and increasing transparency in the management of returned state assets. Although respondents generally expressed positive views regarding the current level of digitalization, they also identified several opportunities for further development.

One of the most frequently mentioned recommendations was the creation of a unified digital information environment. Participants suggested developing a single public platform or dashboard containing comprehensive information on returned assets, including their lega status, current use, auction history, and contribution to the state. Such a platform would improve public access to information while increasing transparency and accountability (P1).

Another commonly discussed recommendation concerned greater integration of government information systems. Respondents argued that stronger interoperability between agencies would reduce duplication of work, improve information exchange, and accelerate administrative procedures. Several participants also emphasized the need for common data standards and more effective coordination between institutions (P2, P5, P7).

Participants further recommended expanding the use of artificial intelligence and advanced analytics. According to the interviews, AI could support the automatic verification of documents, identify inconsistencies in datasets, monitor asset performance, and assist decision-makers by generating analytical recommendations. Such technologies were viewed
as tools that could improve both efficiency and transparency (P1, P2, P7).

Finally, respondents highlighted the importance of continuous institutional improvement. They argued that future reforms should focus not only on introducing new technologies but also on strengthening legal frameworks, improving administrative procedures, increasing digital literacy, and maintaining transparent communication with businesses and society. These measures were considered essential for ensuring that digital governance continues to enhance public trust and the effective management of returned state assets.

Overall, the interviews indicate that participants view digital governance as an evolving process. While significant progress has already been achieved, further improvements in data integration, technological innovation, institutional coordination, and public access to information are expected to strengthen transparency and business trust in the future.

4.Discussion

4.1. Digital Governance as a Driver of Transparency

The findings indicate that digital governance has substantially improved transparency in the management of returned state assets. Participants consistently stated that digital platforms, particularly E-Qazyna, have reduced the human factor, increased access to information, and created more transparent procedures for asset management and electronic auctions. These findings support the arguments presented by the OECD and UN DESA, which suggest that
digital governance enhances transparency by improving access to information and standardizing administrative processes.
The results also support Principal–Agent Theory. According to this theoretical perspective, information asymmetry between public institutions and external stakeholders represents one
of the main governance challenges. The interviews demonstrated that digital platforms reduce this asymmetry by providing businesses with greater access to information and allowing stakeholders to monitor administrative procedures more effectively. Consequently, digital governance strengthens transparency by making institutional processes more visible and easier to verify.
However, the findings also suggest that transparency extends beyond the simple publication of information. Participants repeatedly emphasized that transparency requires equal access to digital platforms, clear procedures, and publicly available information throughout the asset management process. This observation is consistent with the literature reviewed in Chapter Two, which argues that meaningful transparency depends on the quality, accessibility, and usability of information rather than its mere availability.
Overall, the findings confirm that digital governance represents an important mechanism for improving transparency in Kazakhstan's returned state asset management system.

4.2. Transparency as a Foundation for Business Trust

One of the central findings of this study is that transparency plays a crucial role in strengthening business trust. Although participants recognised the importance of digital technologies, they consistently argued that businesses trust public institutions primarily because digital governance creates transparent, predictable, and fair procedures rather than simply introducing new technological tools.
These findings strongly support Institutional Trust Theory, which suggests that trust develops when stakeholders perceive public institutions as transparent, reliable, and consistent in their decision-making. Participants repeatedly emphasized that equal access to information, standardized procedures, and automated decision-making reduce uncertainty and increase confidence in government institutions. This indicates that trust is built through institutional practices rather than technology itself.
The findings also support previous studies discussed in Chapter Two, which argue that transparency reduces uncertainty and information asymmetry between governments and external stakeholders. Businesses are more willing to participate in electronic auctions when they believe that all participants operate under identical rules and that outcomes are
determined objectively through digital systems. In this respect, transparency contributes to both procedural fairness and institutional legitimacy.

However, the findings also demonstrate that digitalization alone is insufficient to create trust. Participants highlighted the importance of stable legislation, consistent implementation of regulations, and effective communication between government institutions and businesses.
These observations are consistent with the literature suggesting that digital governance should be understood as one component of broader institutional reform rather than an independent driver of trust.
Therefore, this study confirms that transparency functions as the principal mechanism through which digital governance contributes to business trust within the management of returned state assets.

4.3. Institutional Challenges in Digital Governance

Although participants generally evaluated Kazakhstans digital governance reforms positively, the findings also revealed several institutional challenges that continue to influence the effectiveness of digital governance.
The most frequently identified challenge concerned interagency coordination and data integration. Several participants reported that government agencies continue to maintain separate databases and different reporting standards, resulting in delays in information exchange and additional administrative procedures. These findings are consistent with previous studies highlighting institutional fragmentation as one of the principal barriers to effective digital governance.
The interviews also demonstrated that technological development has progressed more rapidly than institutional integration. While digital platforms such as E-Qazyna have significantly improved transparency in asset realization, respondents indicated that further improvements in interoperability and standardized information exchange are still required.
Similar observations were made in the literature reviewed in Chapter Two, where scholars argued that digital governance depends not only on technology but also on institutional coordination and effective governance structures.
The interview with the representative of Samruk-Kazyna provided additional evidence supporting this conclusion. The participant explained that integrating information systems across organizations requires common standards, unified methodologies, and consistent data structures before meaningful digital cooperation can be achieved. This finding demonstrates that digital transformation is not solely a technological process but also an organizational and institutional one.
Overall, the findings indicate that strengthening cooperation between government institutions remains an important priority for improving transparency and increasing the overall effectiveness of digital governance in Kazakhstan.

4.4. Data Quality, System Reliability, and Future Development

The findings demonstrate that the effectiveness of digital governance depends not only on the implementation of digital platforms but also on the quality of data and the reliability of digital systems. Participants consistently emphasized that accurate, complete, and up-to-date information is essential for maintaining transparency and strengthening business trust.
This finding supports the literature discussed in Chapter Two, which argues that transparency is meaningful only when the information provided is reliable and accessible. The interview participants noted that technical failures, outdated information, or inconsistencies in digital records

may reduce confidence in government institutions, regardless of the existence of advanced digital technologies. These observations reinforce the argument that digital governance should focus on improving the quality of information rather than simply increasing the amount of publicly available data.

Another important finding concerns the future development of digital governance in Kazakhstan. Participants recommended strengthening interoperability between government agencies, creating unified digital databases, expanding analytical capabilities, and introducing artificial intelligence to support decision-making processes. These recommendations closely align with international best practices discussed in the literature review, particularly the emphasis on integrated digital ecosystems and evidence-based governance.

At the same time, respondents stressed that technological innovation should be accompanied by institutional reforms. Improvements in legislation, data governance, administrative procedures, and communication between public institutions and businesses were viewed as equally important for increasing transparency and public confidence. These findings support the argument that successful digital governance requires both technological and institutional
development.

Overall, this study suggests that future digital reforms should focus not only on expanding digital infrastructure but also on improving data quality, strengthening institutional cooperation, and ensuring that digital systems remain transparent, reliable, and user-oriented.

4.5. Theoretical and Practical Implications

The findings of this study contribute to both theory and practice. From a theoretical perspective, the research supports Principal–Agent Theory by demonstrating that digital governance reduces information asymmetry between government
institutions and business stakeholders through greater transparency and improved access to information. The findings also support Institutional Trust Theory, showing that business trust develops when digital governance is accompanied by transparent procedures, reliable information, and predictable institutional practices.

At the same time, the study extends the existing literature by applying these theoretical perspectives to the relatively underexplored context of returned state asset management. While previous studies have primarily focused on digital government or public service delivery, this research demonstrates how digital governance influences transparency and trust within a specific and politically significant area of public administration.

From a practical perspective, the findings provide several recommendations for policymakers and practitioners. These include improving interoperability between government information systems, strengthening data standardization, enhancing the functionality of the E-Qazyna platform, expanding public access to information, and introducing advanced digital technologies such as artificial intelligence to support analytical and decision-making
processes.

The study also highlights the importance of maintaining transparent communication with businesses and ensuring that digital reforms are accompanied by institutional improvements. Such measures may contribute to greater public confidence, more effective governance, and stronger cooperation between the state and the private sector.

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Digital Participation and Transparency in Decision-Making: A Pilot Measurement Framework

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ABSTRACT

This study examines whether digital participation enhances transparency in local government decision-making through a process-based framework. It develops two indices—Digital Participation and Transparency—and applies them to ten cases from Barcelona and İzmir. Findings show that participation does not automatically produce transparency; outcomes depend on feedback mechanisms, process design, and institutional integration. While Barcelona generally performs better, variation across policy domains indicates that platform maturity alone is insufficient. The study contributes by offering a measurable, process-level approach and identifying conditions under which participation becomes a meaningful governance tool.

KEY WORDS: digital participation, transparency, governance design

1. INTRODUCTION

Over the past decade, local governments have increasingly adopted digital technologies to make their decision-making processes more participatory and transparent (Shin et al., 2024, p. 1-2). The aim of these technologies is to transform citizens into active participants who directly contribute to decision-making processes (Kim & Lee, 2017, p. 1028–1031). This transformation directly resonates with the adoption of smart city strategies, i.e. "open and good governance" approaches at the local level (Nam & Pardo, 2011, p. 286).

Digital participation platforms stand out as innovative mechanisms having a potential to make the decision-making processes of local governments both visible and traceable (Bertot et al., 2010, pp. 265–267). Despite the increase in the number of digital participation platforms, the question of whether these tools actually produce greater transparency in decision-making processes remains an unanswered question. The existing literature addresses digital participation platforms within a normative framework, often taking for granted the assumption that these tools will increase transparency, legitimacy, and democratic quality (Cucciniello et al., 2017, p. 33–36). However, according to recent studies, digitalization does not automatically lead to transparency. Findings indicate that transparency outcomes are rather associated with process design, feedback mechanisms, and institutional practices (Cucciniello et al., 2017, p. 34–37; Grimmelikhuijsen & Welch, 2012, p. 564–566). Nevertheless, there is limited scholarly focus on how digital participation affects transparency in decision-making via measurable indicators (Cucciniello et al., 2017, p. 36–37). Many existing studies measure participation using indicators that are relatively easy to observe, such as the number of platforms adopted or the number of proposals submitted, but do not reveal how participation actually works in practice or whether it is likely to improve transparency (Kim & Lee, 2012, p. 823; Grimmelikhuijsen & Welch, 2012, p. 566). Moreover,

transparency research has largely relied on perception-based measures rather than process-based indicators that examine whether decision processes are visible, documented, and traceable (Cucciniello et al., 2017, p. 42).

This research aims to investigate the relationship between digital participation and transparency not through abstract platform features or relying on user perceptions, but through concrete and observable participatory decision-making processes. Therefore, the main research question of the study is: "To what extent do digital participation platforms improve transparency in local governance processes?" With this question, the study mainly examines whether decision-making processes at the local level become more transparent, as the quality of digital participation increases. If this is the case, the research will then aim to understand the underlying conditions in which it produces transparency.

This study contributes to the literature in three ways. First, it empirically tests normative assumptions about digital participation and transparency through a process-based, measurable, and comparative approach, addressing a gap that existing studies have largely left unexamined (Cucciniello et al., 2017, pp. 33–36; Kim & Lee, 2017, pp. 1026–1028). Another contribution is a methodological contribution by measuring both concepts at the process level through concrete and observable indicators, rather than through perception-based measurements or platform characteristics alone. Also, it provides practical insights for municipalities by demonstrating that process design, feedback mechanisms, and institutional integration are the real determining factors in generating transparency, rather than the mere existence of digital participation platforms.

More specifically, the study examines how platform maturity and institutional context shape the relationship between digital participation and transparency. To do this, the municipalities of Barcelona and Izmir are selected as the main case studies in a comparative design. The Decidim platform, a long-established and institutionalized digital participation infrastructure in Barcelona, is specifically compared with emerging digital participation implementations in Izmir. The cases are selected based on a Most Similar Systems Design (MSSD) logic. Both cities are large metropolitan municipalities with comparable population size, similar administrative structure and governance scope, and digital participation tools and smart city strategies have been adopted in both cities in recent years.

The capacity of digital participation platforms to generate transparency largely depends on their level of institutionalization and integration into governance structures (Bertot et al., 2010, p. 266–268). Long-standing platforms integrated into decision-making processes offer stronger feedback mechanisms and higher traceability. In this context, the Decidim platform in Barcelona stands out as a significant example of institutionalized digital participation. In contrast, digital participation practices in Izmir have a more fragmented and emerging structure. This difference makes it possible to comparatively examine the relationship between platform maturity and transparency.

This study should be understood as a pilot exploration of the relationship between digital participation and transparency at the process level. Rather than offering definitive causal claims, the research focuses on developing and testing a measurement framework that captures how participation and transparency operate in practice within local governance contexts.

At the same time, this research forms part of a broader thesis project that expands both the empirical scope and the analytical depth of the study. The full thesis will extend the dataset, refine the measurement strategy, and apply more systematic statistical testing to examine the relationship between participation and transparency across a larger number of cases.

2. Literature Review

The rising number of digital participation tools has generated strong expectations for decision-making processes to become more transparent. The popular assumption is that online participation platforms will increase transparency by making citizens an active player in decision-making processes (Kim & Lee, 2017, p. 1028–1031). The existing empirical research shows a positive relationship between citizen participation and transparency. According to Kim and Lee (2017, p. 1030–1033), integrating participation into different stages of the decision-making process in local governments contributes to a clearer and more understandable perception of the processes. Similarly, Harrison and Sayogo (2014, p. 518–520) stress that institutionalized participation mechanisms support transparency and accountability practices. Welch, Hinnant, and Moon (2005, p. 378–381) also show that the level of interaction offered by e-government tools stands as a crucial factor in citizens' trust and perception of transparency in decision making processes. When digital participation platforms work well, they record what citizens say, show how this input is handled, and make it possible to follow the path from participation to decision which can contribute to transparency (Matheus et al., 2021, pp. 9–11). However, Matheus et al. (2021, p. 11) also note that this potential is not always realized, as many platforms produce participation data without publishing it in ways that citizens can easily access or understand.

However, transparency is not only about having access to information (Meijer, 2009, p. 258–260). It is also about tracking how decision-making processes operate, which inputs lead to which results, and the reasons behind those decisions (Grimmelikhuijsen & Welch, 2012, p. 564–566). Meijer (2009, p. 260-264) considers modern transparency as a multidimensional concept and argues that access to information alone is not sufficient; it is also necessary to make processes understandable and traceable. This approach emphasizes the importance of addressing transparency from a process-based perspective. Similarly, Cucciniello, Porumbescu, and Grimmelikhuijsen (2017, p. 35–37) state that transparency cannot be measured by a single indicator and that its different dimensions must be addressed empirically. Grimmelikhuijsen, Porumbescu, Hong, and Im (2013, pp. 573–576) highlight that transparency operates through different dimensions, including the availability of information, the visibility of decision-making processes, and the communication of outcomes. Of these three dimensions, process transparency is most closely related to digital participation, because participation processes, when documented and published, help make decision-making more visible (Grimmelikhuijsen et al., 2013, pp. 575–576).

The design of digital participation platforms and feedback mechanisms are also crucial for transparent decision-making. For digital participation to impact transparency, it is necessary to clearly demonstrate how the citizen suggestions are addressed. Grimmelikhuijsen and Welch (2012, p. 564–566) emphasize that making visible how citizen input is used in the decision-making process is one of the key elements of computer-mediated transparency. They argue that participation processes lose their credibility in the eyes of citizens and fail to meet expectations of transparency, especially if traceability and feedback loops are not there (Grimmelikhuijsen & Welch, 2012, p. 565–567). Mariani, Mortati, and Rizzo (2023, p. 227-229) also highlight the role of design in e-participation processes. They demonstrate that explicit feedback mechanisms and explicit justifications behind official decisions are crucial in transforming participation from a symbolic act into a meaningful governance tool (Ibid). Furthermore, Simelio-Solà et al. (2021, p. 8) show a similar pattern in their study of participatory budgeting platforms in Catalonia, demonstrating that formal participation mechanisms often remain symbolic, collecting citizen input but not fully integrating it into final decisions.

The literature also draws attention to the limitations of digital tools in generating transparency. The existence of digital participation tools does not always imply true openness or accountability (Bertot et al., 2010, p. 266–268). Bertot, Jaeger, and Grimes (2010, p. 266–268) note that without appropriate institutional arrangements and process designs, these tools cannot be more than a symbolic "box-checking" mechanism. Tomàs (2024, p. 7) suggests that digital participation tools may sometimes be used to signal openness without producing substantive changes in governance practices. Similarly, Cuillier and Piotrowski (2009, p. 445–447) emphasize that institutional practices and administrative preferences might limit citizens' ability to have access to information jeopardizing institutional transparency altogether. These findings demonstrate that the impact of digital participation on transparency is not automatic since it very much depends on context, institutional capacity, and platform design.

These contextual differences are further highlighted through the maturity level and institutional development of digital participation platforms. There are significant differences, particularly between platforms that have been in use for a long time and are integrated into decision-making processes, and newer platforms with more limited functionality (Nam & Pardo, 2011, p. 285-288). For instance, studies on the Decidim platform show that its design principles for feedback, traceability, and process transparency facilitate a meaningful participation in decision-making processes.

In conclusion, the potential of digital participation in increasing transparency depends on the level of institutionalization of participation, the design characteristics of the platforms, and contextual factors. Higher transparency scores are expected in situations where participation is high and institutionalized, while participation risks remaining symbolic in situations where feedback mechanisms and traceability are weak. This theoretical framework supports the expectation of a positive relationship between digital participation and transparency. Yet, as the literature reviewed above demonstrates, three gaps remain. First, most studies measure participation through easily observable indicators without examining how it operates in practice at the process level. Second, transparency is predominantly measured through perception-based approaches rather than through observable, document-based indicators. Finally, comparative research that examines similar processes across different institutional contexts remains limited (Cucciniello et al., 2017, pp. 33–36; Grimmelikhuijsen & Welch, 2012, pp. 564–566; Kim & Lee, 2017, pp. 1026–1028). This study addresses these gaps by focusing on participation quality at the process level, developing document-based transparency indicators, and comparing two cities that differ in platform maturity and institutional context.

3. Methodology

This study adopts a quantitative research design to examine the relationship between digital participation and transparency at the process level. The two main variables of this research aim to measure the quality of digital participation and the transparency of decision-making processes. Both concepts are analyzed at the process level by treating each participatory process as an individual unit of observation. This approach allows to conduct a micro-level analysis of how participation and transparency operate within individual decision-making processes, rather than at a macro-level analysis.

The study is structured around three directional hypotheses that will be formally tested in the extended thesis. H1 proposes that participatory processes with higher digital participation quality

tend to exhibit higher transparency. H2 suggests that, when time effects are controlled, processes conducted in cities with higher platform maturity show higher transparency levels. H3 expects the participation–transparency relationship to vary by policy domain, with stronger effects in areas such as budget and environment that directly involve resource allocation and daily life. While the pilot study does not statistically test these hypotheses due to the limited sample size, the analysis is designed to explore whether the patterns observed across ten processes are consistent with these expectations.

The unit of analysis of this research is the official decision-making processes carried out by the municipalities of Barcelona and Izmir through digital participation between 2015 and 2025 and documented online. A participatory process is an officially initiated procedure that invites citizens to contribute to municipal decision-making and results in a documented policy outcome. Such a process usually has a clear timeline, defined participation stages (such as proposal submission, evaluation, and decision-making), and a final outcome that is documented and published by the municipality. Examples of participatory processes include participatory budgeting cycles, environmental planning consultations, and infrastructure project deliberations conducted through digital platforms. This distinction is important because individual proposals or single participation events are isolated actions, while processes cover the entire decision-making cycle and enable transparency to be assessed across stages.

The data used for this study are collected from publicly accessible digital participation platforms, process pages, decision texts, outcome reports, and strategy documents published by the municipalities of Barcelona and Izmir. The dataset is created by coding content directly from these primary sources, which are directly linked to decision-making processes and publicly verifiable. Regarding the Barcelona case, Decidim, a digital participation system actively used since 2016, constitutes the main data source. The analysis includes the digital traces of all stages of participatory processes, including process announcement texts, calls for participation, citizen input lists, evaluation content, and final decision outcomes. Moreover, municipal annual reports and participation outcome summaries are used to support and contextualize platform-based information. The open-source structure of Decidim enables access to both past processes and the documented results.

As for Izmir, the data are collected from the municipality's official website and its sub-portals. The dataset is primarily based on strategic planning documents post-2022, annual municipal reports, and Kent Konseyi (City Council) process announcements. Project outcome lists and available feedback materials are also included in the analysis. All documents used are publicly accessible ensuring the transparency and verifiability of the data sources for both cases.

The sample of this research consists of 10 participatory processes (5 per city) selected from the population of the documented digital participation processes between 2015 and 2025. Two mandatory inclusion criteria are applied: (1) the process must involve citizen input, and (2) it must have a visible decision outcome. These criteria make it possible to objectively score processes in terms of both participation and transparency. After defining the population, all eligible processes are grouped according to thematic policy areas (e.g., environment, budget, infrastructure). This procedure aims to reduce selection bias by ensuring each thematic category carries equal weight; where a category contains more processes than the sample size allows, processes are selected randomly to prevent the overrepresentation of more transparent cases.

Transparency is operationalized as a multidimensional concept reflecting public accessibility, documentation, and traceability throughout the entire decision-making process. It is defined as the accessibility of information, the justification of decisions, and the traceability of the link between citizen input and decision outcomes (Meijer, 2009, pp. 260–264; Grimmelikhuijsen

& Welch, 2012, pp. 564–566). Four criteria guide the evaluation of transparency levels across processes: visibility, accessibility, traceability, and substantiveness. Visibility refers to how clearly citizens can access fundamental information related to the participatory process, including the process page, timelines and stages, published final decisions, and accessible results. Accessibility is defined as the ease with which citizens can obtain process-related information in a downloadable and readable format, without login requirements and with multiple file options. Traceability captures the extent to which it is possible to follow how citizen input moves through the process and which proposals lead to which decisions. Indicators include proposal lists and clear statements of proposal status (accepted, rejected, under review). Substantiveness reflects how decisions are justified, focusing on summaries of citizen input, written explanations for accepted and rejected proposals, documented changes in decision texts, and explicit links between action or resource plans and citizen input. Each indicator is coded as 0 or 1 depending on whether it is present. Since each criterion comprises four indicators, criterion scores range from 0 to 4. These scores are combined to create an overall Transparency Index for each process, which serves as the dependent variable of the study.

The independent variable is the Digital Participation Index, which focuses on the quality rather than the mere existence of participation. Participation is defined as citizens' ability to access the decision-making process, influence its design, and monitor its outcomes (Kim & Lee, 2017, pp. 1028–1031; Harrison & Sayogo, 2014, pp. 516–518). Digital participation is operationalized through four dimensions: breadth of participation tools, depth of engagement, feedback mechanisms, and inclusion and usability. Breadth of tools captures the variety of participation mechanisms available, including online and offline components, interactive features such as voting or prioritization, and opportunities for citizen interaction through comments or reactions. Depth of engagement measures how substantively citizens can influence the process, including the ability to submit proposals, revise drafts, observe evaluation stages, and shape outcomes through citizen input. Feedback mechanisms assess whether summary reports, written evaluations, proposal-level results, and justifications for rejected proposals are provided. Inclusion and usability reflect the inclusiveness of the process and the ease of platform use, measured through announcement practices, multiple participation channels, targeted invitations to specific groups, and usability across devices.

The analysis also includes two control variables and one moderating variable. City is included as a control variable to account for structural differences in the digital governance histories of Barcelona and Izmir. Year is included as a second control variable, as platform maturity and transparency practices are expected to develop gradually over time, and this variable ensures that such temporal improvements are not mistakenly attributed to participation quality. Policy domain is included as a moderating variable, as certain areas directly affecting daily life, such as urban infrastructure, environment, and budget planning, are expected to generate stronger demands for transparency. In the planned extended analysis, these variables will be integrated into an OLS regression model to formally test H1, H2, and H3 across a larger dataset of approximately 40 processes.

The analytical strategy of this study is designed as an exploratory pilot analysis focusing on the relationship between digital participation and transparency at the process level. Due to time constraints, the analysis is based on a purposive sample of ten participatory processes, consisting of one process from each of five policy domains in Barcelona and Izmir. The aim of this pilot study is not to produce generalizable causal claims, but to examine patterns, test the measurement strategy, and illustrate how participation and transparency mechanisms operate across different contexts.

In the first stage of the analysis, Transparency and Digital Participation indices are constructed for each selected process using equally weighted indicators and standardized to a 0–100 scale. This step translates qualitative content analysis into numerical values and allows for a systematic comparison of processes across cities and policy domains. One of the main objectives of this stage is to assess whether the proposed indices meaningfully capture variation between processes. In the second stage, descriptive and comparative analysis is conducted. Index scores are compared across cities and policy domains to identify similarities, differences, and recurring patterns in participation and transparency practices. Rather than focusing on statistical inference, this stage emphasizes cross-case comparison and process-level interpretation, highlighting how differences in platform context and policy area shape transparency outcomes. Regression analysis is not applied in this pilot study due to the limited number of observations. Instead, the results are used to refine the analytical framework and inform the design of a subsequent, larger-scale study. In the planned extended analysis, the dataset will be expanded to approximately 40 processes, allowing for the application of regression models to test the relationship between digital participation and transparency while controlling for city, policy domain, and time effects.

To ensure reliability, all processes are coded using clearly defined rules, and selected cases are re-coded after a time interval to check for internal consistency. As the coding categories are defined through explicit and standardized rules, ambiguous cases are resolved strictly on the basis of visible documentary evidence, and no assumptions are made beyond what is explicitly published. In the extended thesis, intra-coder reliability will be formally assessed using Cohen's Kappa on a randomly selected subset of approximately 10% of processes, with a value above 0.70 considered acceptable for this type of content analysis. Given the exploratory and observational nature of the pilot study, findings are interpreted as indicative rather than causal. Nevertheless, the analysis provides a structured foundation for a more comprehensive empirical investigation.

4. Findings

In this section, a total of 10 participatory processes are analyzed for Barcelona and Izmir, comparing them according to the Transparency Index and the Digital Participation Index. The findings focus not only on whether participation exists, but also on how participation platforms are designed, participation is documented and reflected in the decision-making process. All evidence and quotations in this section are drawn from publicly accessible platform interfaces and official documents, including proposal pages, status labels, process timelines, outcome sections, and municipal decision texts.

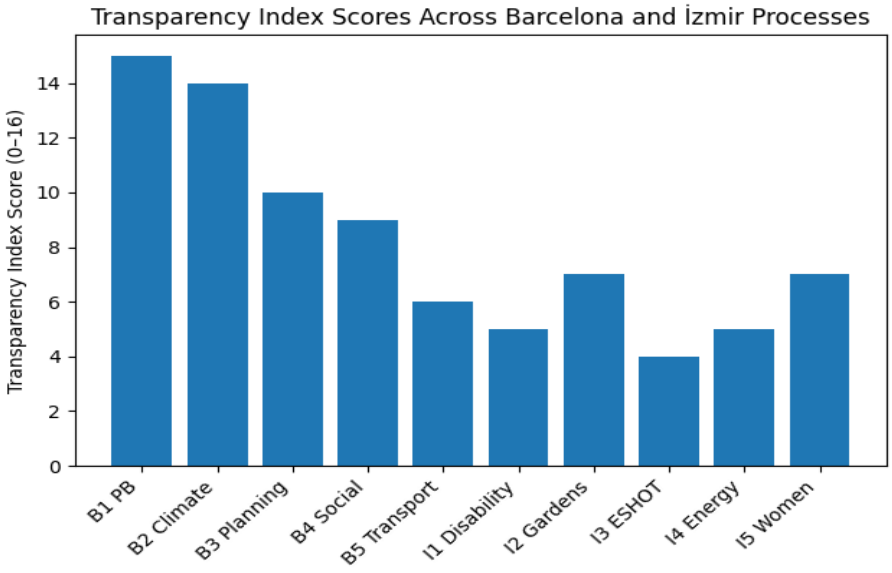


Figure 1. Transparency Index Scores Across Selected Participatory Processes in Barcelona and İzmir

4.1 Barcelona: Institutionalized Digital Participation

As Figure 1 demonstrates, the Barcelona processes generally indicate a high level of digital participation and transparency. The main reason for this is that *Decidim* offers institutionalized participation by publicly and systematically documenting all stages of the processes. However, the coding results show that this high performance is not equally distributed across all policy domains.

The first process chosen for Barcelona is the Participatory Budget process (B1). As you can see Table A1 and Table A2 in Appendix, this process is the example with the highest scores in terms of both Transparency and Digital Participation. During this process, citizens were able to submit new proposals, and those proposals were voted on. Moreover, each proposal page displayed a clear status label indicating whether the proposal was "accepted," "rejected," or "in progress"[15]. This directly enabled proposal–decision traceability. In addition, proposal pages display visible support counts (e.g., "23 supports"), indicating that proposals were collectively prioritized before final decisions were taken[16]. Outcome pages further specify that "selected projects will be implemented according to available budget and technical feasibility"[17]. Together, these features explain why the process received a full score on the traceability criterion. However, substantiveness was slightly lower, as rejected proposals were often assessed only against general criteria rather than receiving proposal-level written justifications.

[15] For details, see, Decidim Barcelona, Participatory Budget process page. Available at: https://www.decidim.barcelona/processes/PressupostosParticipatius/?locale=en

[16] see, Decidim Barcelona, Participatory Budget process page, https://www.decidim.barcelona/processes/pressupostos2024

[17] See, Decidim Barcelona, Results section, https://www.decidim.barcelona/processes/pressupostos2024/f/6466/budgets?utm_source=

The Climate and Green Spaces process (B2) demonstrates high transparency as well. All stages of the process are publicly presented through a clearly defined timeline, typically structured as "Proposal submission – Evaluation – Results"[18]. Citizen inputs are listed, and final decisions are published. Nevertheless, decision texts frequently state that proposals were "assessed based on feasibility and alignment with environmental objectives" without providing proposal-specific explanations[19]. This reliance on general assessment criteria resulted in a lower substantiveness score compared to participatory budgeting. In contrast, transparency levels in the Urban Planning (B3) and Social Services (B4) processes are moderate. While calls for participation and final outcomes are publicly visible, proposal-level evaluation texts explaining how citizen input influenced decisions are largely absent. As a result, it is difficult to trace individual proposals to final outcomes, leading to lower scores on traceability and substantiveness.

In Table A1, the least transparent example in Barcelona is the Transport Consultation process (B5). Although citizens were able to express their views through comments and submissions, proposal pages do not include status labels or written evaluation texts explaining how final decisions were reached[20]. The absence of proposal-level outcomes and justifications constitutes direct evidence of low traceability and substantiveness. This case illustrates that transparency can remain limited despite relatively high levels of digital participation.

4.2 Izmir: Limitations of Document-Based Participation and Systematic Transparency

The participatory processes are examined for Izmir not through an integrated digital platform such as *Decidim*, but through official documents published by the İzmir Kent Konseyi (İzmir City Council)[21] and the İzmir Büyükşehir Belediyesi (Municipality of İzmir). While this document-based approach does not prevent decision-making outcomes, as illustrated in Figure 1, it creates significant limitations in terms of transparency.

In the Disability Services (I1) and ESHOT Service Allocation (I3) processes[22], final decisions are clearly documented in municipal decision texts. However, these documents typically state that "Kent Konseyi önerileri değerlendirilmiştir (City Council's proposals have been taken into account)" without providing any proposal-level evaluation table or written justification explaining which proposals were accepted or rejected. The absence of proposal-specific reasoning results in low traceability and substantiveness scores.

The Urban Gardens and Green Areas process (I2) represents a relatively higher level of transparency within Izmir. The practices implemented at the end of the process are publicly shared. Nonetheless, official documents do not specify which proposals shaped these practices or why

[18] See, Decidim Barcelona, Climate and Green Spaces process page, https://www.decidim.barcelona/processes/placlima

[19] See, Decidim Barcelona, Evaluation section, https://www.decidim.barcelona/processes/placlima

[20] See, Decidim Barcelona, Transport Consultation proposal page, https://www.decidim.barcelona/processes/PMU2025-2030

[21] For details, see, https://www.izmirkentkonseyi.org.tr/duyurular

[22] To access all five processes, see, https://www.izmirkentkonseyi.org.tr/tr/BizeKatilin/KentKararlari

alternative views were not preferred, which limits proposal–decision traceability and results in a moderate transparency score.

The Karaburun Energy process (I4) illustrates symbolic participation. While official texts indicate that "paydaşların görüşleri alınmıştır (consulted with stakeholders)," no formal explanation is provided regarding how these views were incorporated into the final decision (İzmir Büyükşehir Belediyesi project documents). This gap between participation claims and documented decision reasoning leads to low transparency scores. Similarly, although the Women's Policies process (I5) represents a thematically strong area of participation, transparency remains moderate due to the limited availability of written justifications explaining how citizen inputs influenced final decisions.

4.3 General Patterns

As illustrated in Figure 1, transparency outcomes vary across policy domains even within Barcelona, suggesting that platform availability alone does not guarantee transparent decision-making. So, the findings point to three main patterns. First of all, the mere existence of digital participation alone does not lead to transparency. Rather, transparency appears to depend primarily on the existence of feedback and justification mechanisms. In addition, platform maturity and institutional structure play a significant role in shaping transparency performance across processes. In the next section, these findings will be used to discuss under what conditions digital participation becomes a meaningful governance tool.

5. DISCUSSION

The main purpose of this study was to analyze the extent to which digital participation platforms make decision-making processes in local governments more transparent at the process level through measurable indicators. The findings show that the relationship between digital participation and transparency is not automatic and linear, but rather strongly dependent on factors such as process design, feedback mechanisms, and institutional structures. These findings empirically support the literature that questions the assumption that digital participation normatively produces transparency. At the same time, they suggest that this relationship operates through specific process-level mechanisms that shape how participation is translated into transparency outcomes.

5.1 Digital Participation ≠ Automatic Transparency

One of the most fundamental findings of the study is that the mere existence of digital participation tools is not sufficient to produce transparent decision-making processes. In the case of Barcelona, despite having an institutionalized and mature digital participation platform, levels of transparency remained limited in some processes (particularly in the areas of transportation and urban planning). This result indicates that when digital participation remains only at the level of "opportunity to participate," it has only a symbolic impact in terms of transparency. Thus, this offers a critical contribution to early e-governance approaches that assumed digitalization would

automatically generate openness and accountability. Because the findings show that transparency is possible not only through access to information, but also through explaining the reasoning behind decisions and linking citizen input to those decisions.

Participation alone does not guarantee that decision-making processes become understandable or traceable for citizens. For transparency to emerge, citizen input must be systematically recorded, evaluated, and reflected in decision outputs in a visible manner. When these intermediate steps are missing, participation may exist at a procedural level but fail to generate meaningful transparency outcomes. Therefore, the findings indicate that the relationship between participation and transparency is conditional rather than automatic.

These findings suggest that digital participation should be understood not as a direct driver of transparency, but as a conditional process whose outcomes depend on the presence of traceability, feedback, and justification mechanisms.

5.2 The Decisive Role of Feedback and Justification Mechanisms

The findings of this study show that feedback and justification mechanisms are the most critical element in producing transparency. Barcelona's participatory budgeting and environmental processes have achieved high transparency scores thanks to clear evaluation structures that show the reasons why citizen proposals are accepted or rejected. In processes with similar levels of participation but where the reasoning behind decisions is not shared, transparency is significantly reduced.

In addition, these mechanisms make it possible to follow how citizen input moves through different stages of the decision-making process. This creates a visible link between proposals, evaluation, and final decisions, which is essential for traceability. Without such links, participation outputs remain disconnected from decision outcomes.

In the case of Izmir, these mechanisms are largely absent. Processes often lead to decisions; however, it is not publicly documented which citizen inputs these decisions were based on. In this case, we can say that although participation produced results, it did not produce transparency. Therefore, the study clearly demonstrates the difference between participation producing results and participation being transparent. This distinction also highlights that transparency depends not only on outcomes, but on the visibility of the decision-making process itself. Thus, it points to a difference between substantive and symbolic forms of participation.

5.3 Platform Maturity and Institutional Structure

The second important contribution of the research is that it clearly indicates the impact of platform maturity on transparency. Barcelona's long-standing digital participation infrastructure ensures that its processes score highly in terms of visibility and accessibility. However, this level of maturity does not translate into equal transparency across all policy domains. This shows that platform maturity is a necessary but not sufficient condition on its own.

At the same time, the findings suggest that institutional integration plays a key role in shaping transparency outcomes. In Barcelona, participation processes are embedded within a structured digital system that systematically documents each stage of decision-making. This increases the consistency and visibility of participation outputs.

The Izmir case shows that even with limited digital platform maturity, some processes can have participatory qualities; however, it reveals that this participation does not translate into transparency as long as institutional feedback and monitoring practices are lacking. This finding suggests that transparency is a result of institutional practices and administrative preferences rather than technical capacity. From this perspective, differences between the two cities reflect broader variations in how participation is organized, documented, and integrated into governance processes.

5.4 Differences According to Policy Domain

The study also shows that the relationship between digital participation and transparency differs across policy domains. In areas directly related to resource allocation, such as budget and environment, relatively higher levels of transparency have been observed in both Barcelona and Izmir. In contrast, in technical fields such as transportation and urban planning, the reasons behind decisions are less frequently shared publicly. This finding demonstrates that demands for and practices of transparency vary across policy domains, meaning the impact of digital participation is contextual.

These differences may also be related to the nature of decision-making in different policy areas. In resource-related domains, public scrutiny and accountability pressures tend to be stronger, encouraging more detailed documentation and justification. By contrast, in technically complex domains, decision-making may rely more heavily on expert knowledge, which can limit the extent to which decisions are explained in a publicly accessible and detailed manner. As a result, even when participation exists, lower levels of justification and traceability may reduce overall transparency.

5.5 Implications for Policy and Research

The key takeaway for policymakers from this study is that digital participation platforms should be designed not merely as tools for inviting participation, but as governance mechanisms that make decision-making rationale visible. Simply providing citizens with the opportunity to express their opinions is not enough to meet expectations of transparency. Transparent evaluation reports, justifications for rejected proposals, and decision-proposal matching are essential elements of generating transparency.

In addition, policymakers should consider how participation processes are documented and communicated, as transparency depends on the visibility of these processes rather than their mere existence. From a research perspective, the findings highlight the importance of focusing on process-level indicators rather than relying solely on perception-based measures or platform characteristics. Using process-based and document-based data makes it possible to better understand how transparency is produced in practice.

6. CONCLUSION

This study examines whether digital participation increases the transparency of decision-making processes in local governments. The findings demonstrate that digital participation

platforms alone do not automatically provide transparency; levels of transparency largely depend on how participation processes are designed, the existence of feedback mechanisms, and institutional practices. In the pilot study, the decision-making processes were found more visible, traceable, and justified, especially in more institutionalized and feedback-oriented participatory processes. Academically, this study makes an empirical contribution to the literature by examining the relationship between digital participation and transparency through measurable indicators at the process level, rather than through perceptions or normative expectations. In this sense, the study contributes not only substantive findings to the literature on digital local governance and transparency, but also offers a replicable research design that can be extended to broader comparative and explanatory analyses. Future research should primarily aim to test the correlation between the two variables by increasing the sample size. Additionally, the research could expand to include more cities and different governance contexts, examining the long-term institutional impacts of digital participation.

On the other hand, this research has several limitations because I designed it as an exploratory pilot study. First, the generalizability of the findings is limited, as the analysis focuses on a small, purposively selected set of ten participatory processes captured from only two cities. While Barcelona and Izmir provide a meaningful comparative context, the results cannot be generalized to other national settings, local government models, or levels of digital capacity. In addition, the analysis relies exclusively on publicly available digital process outputs and official municipal documents. As a result, forms of participation that are not documented online such as internal deliberations, informal consultations, or citizen perceptions are not captured. The measurement approach also involves an element of researcher judgment. Although coding categories are defined through explicit and standardized rules and ambiguous cases are resolved strictly on the basis of visible documentary evidence, some degree of subjectivity cannot be fully eliminated. Finally, due to the cross-sectional and exploratory nature of the pilot study, the analysis cannot support causal claims about the effect of participation on transparency.

In conclusion, the contrast between B1 and I3 alone, a 62-point gap in transparency scores despite both processes resulting in formal decisions, illustrates how much governance design matters beyond the mere existence of platforms. Therefore, this study demonstrates that the potential of digital participation platforms to generate transparency is determined by process design, feedback quality, and institutional structure, rather than technical capacity. Digital participation can enhance transparency under the right conditions; however, when these conditions are not met, participation risks becoming a mere symbolic practice.

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Appendix. Process-Level Coding Results Table A1. Transparency Index – Process Based Coding

City	Process	Visibility	Accessibility	Traceability	Substantiveness	Short Coding Justification
Barcelona	B1 Participatory Budget	4	4	4	3	Proposal pages, status labels, vote counts, and outcome links available; limited proposal- level justification for some rejected proposals
Barcelona	B2 Climate & Green Spaces	4	4	3	3	Timeline and outcomes published; proposal–decision linkage present but justifications mostly general
Barcelona	B3 Urban Planning	3	3	2	2	Process visible, but proposal-level evaluation texts limited
Barcelona	B4 Social Services	3	3	2	1	Outcomes published without detailed reasoning for rejected inputs
Barcelona	B5 Transport Consultation	3	2	1	0	Citizen input visible, but no proposal-level outcomes or justifications

İzmir	I1 Disability Services	2	2	1	0	Decisions documented, but citizen input not linked to outcomes
İzmir	I2 Urban Gardens	3	2	1	1	Outputs visible; limited explanation of how inputs shaped decisions
İzmir	I3 ESHOT Services	2	2	0	0	Service decisions published without participatory traceability
İzmir	I4 Karaburun Energy	2	2	1	0	Participation mentioned but no decision justification provided
İzmir	I5 Women's Policies	3	2	1	1	Thematic participation visible; limited proposal-level reasoning

Table A2. Digital Participation Index – Process-Based Coding

City	Process	Breadth	Depth	Feedback	Inclusion & Usability	Short Coding Justification
Barcelona	B1 Participatory Budget	4	3	3	4	Proposal submission, voting, and outcome feedback enabled
Barcelona	B2 Climate & Green Spaces	4	3	3	3	Multiple tools and feedback summaries available
Barcelona	B3 Urban	3	2	2	3	Participation enabled but limited iterative

	Planning					engagement
Barcelona	B4 Social Services	3	2	1	3	Participation present; feedback limited
Barcelona	B5 Transport Consultation	3	1	0	3	Input collection without feedback mechanisms
İzmir	I1 Disability Services	2	1	0	2	Consultative participation without feedback
İzmir	I2 Urban Gardens	2	1	1	2	Limited feedback at process level
İzmir	I3 ESHOT Services	1	0	0	1	Announcement-style participation
İzmir	I4 Karaburun Energy	2	1	0	2	Participation claims without evaluation
İzmir	I5 Women's Policies	2	1	1	2	Thematic engagement with limited feedback

AI Data Centers in Kazakhstan: Foreign Direct Investment, Economic Viability, and Who Benefits

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ABSTRACT

Kazakhstan is undergoing a rapid build-out of AI data center infrastructure, driven by a combination of state policy, domestic private capital, and a diverse wave of foreign direct investment. This paper examines the current landscape of AI data centers in Kazakhstan between 2024 and 2026, asking who is financing and building this infrastructure, what criteria attract foreign companies to the region, and whether the model is economically viable and sustainable over time. We map the major actors across state, private, and foreign investment tiers; analyse six key FDI decision criteria including electricity cost, land availability, geopolitical positioning, and regulatory incentives; and assess the distribution of economic benefits across actors. Drawing on market data, policy documents, and comparative cases from Malaysia and China, the paper argues that Kazakhstan holds a genuine competitive position in the global data center investment market but faces real risks around energy sustainability and the concentration of benefits among incumbent actors. The paper contributes to scholarship on digital industrialization in post-Soviet states and serves as a practical foundation for technology and AI data center consulting in Central Asia.

KEYWORDS: AI data centers, Kazakhstan, foreign direct investment, digital infrastructure, Central Asia, economic viability

1 INTRODUCTION

Kazakhstan is at a turning point. For decades the country built its prosperity on oil, gas, and minerals. Now, it is making a deliberate bet on artificial intelligence and digital infrastructure as the next pillar of national development. In 2025, the government established a dedicated Ministry of Artificial Intelligence and Digital Development, and the AI Development Concept 2024-2029 targets 2-3% annual GDP growth from AI, five billion US dollars in IT exports, and five million citizens trained in AI skills by 2029 (GlobalCIO, 2025). In January 2026, a national AI law came into force, making Kazakhstan one of the first post-Soviet states with binding AI regulation structured along risk-based principles similar to the EU AI Act (Caspian Post, 2026).

Most existing scholarship on Kazakhstan's digital economy addresses e-government modernization and broadband connectivity. The political economy of the AI compute layer, specifically who owns it, who profits from it, and who is at risk of being left out, remains largely unexamined. This paper fills that gap. It is structured around three questions: who is building and financing Kazakhstan's AI data center infrastructure; what criteria attract foreign companies to invest in the region; and whether the model is economically viable and sustainable in the long run.

The findings are designed to serve as a foundation for technology consulting, investment advisory, and policy work in the Central Asian context.

2 CURRENT STATE OF AI DATA CENTER INFRASTRUCTURE

As of 2024, the commercial data center market in Kazakhstan was small but growing quickly. Revenue in the broader data center segment was projected at 324.5 million US dollars in 2024, with a compound annual growth rate of 0.29% projected through 2029 under baseline scenarios, though analysts note this figure is likely understated given the pace of new project announcements (Statista, 2024). Three companies controlled over 75% of server rack capacity: Kazakhtelecom at 44.8%, Transtelecom at 24.6%, and National Information Technologies (NIT) at 8.1% (Data Center Dynamics, 2026). The Central Asia data center investment market, which includes Kazakhstan, was valued at 65 million US dollars in 2022 and is projected to reach 179.7 million US dollars by 2028 at an 18.47% CAGR, with Kazakhstan representing the largest single country within this regional market (Arizton, 2024).

The government's stated infrastructure target is to grow from approximately 4,000 IT racks in 2025 to 20,000 by 2030 through ten new Tier III and Tier IV facilities (Eurasianet, 2026). The flagship initiative driving this ambition is the Data Center Valley in Ekibastuz, Pavlodar Region, formally launched in January 2026. The project envisions the largest data center campus in Central Asia, with up to 1 gigawatt of energy capacity, 1,400 hectares of allocated land, and a target of 30 billion US dollars in total investment (Astana Times, 2026a; Azernews, 2026). Kazakhtelecom is constructing the anchor 50 MW AI-focused facility there, due in mid-2027. In June 2025, Central Asia's first Tier IV data center broke ground in Astana through Akashi Data Center, and Kazakhstan launched its first national supercomputer ranked 86th globally, with approximately half of its capacity allocated to government agency workloads (Astana Times, 2025; Data Center Dynamics, 2026).

Table 1: Key AI Data Center Projects in Kazakhstan (2024-2026)

Project	Lead Investor	Scale	Status (2026)	Foreign Partners
Ekibastuz Data Center Valley	Kazakhtelecom (state)	1 GW / 1,400 ha	Under construction	Chinese energy firm (100 MW JV)
Sovereign AI Center	Freedom Holding (domestic)	$2 billion	In development	NVIDIA, OpenAI (USA)
Beeline Hyper Cloud	VEON/Beeline	Tier III, Almaty	Groundbreaking Dec 2025	Huawei (China)
Akashi/China Mobile	China Mobile	Tier IV, Astana	MOU signed Jul 2025	China Mobile
GK Hyperscale	GK Hyperscale Ltd	Hyperscale	Agreement Mar 2025	Singapore

National Supercomputer	Government / Presight	Top 100 global	Operational 2025	Presight (UAE)

3 FOREIGN DIRECT INVESTMENT AND MAJOR PLAYERS

3.1 FDI Overview

Kazakhstan recorded 15.7 billion US dollars in FDI in 2024, an 88% increase over the prior year and the highest figure in its post-Soviet history (SpecialEurasia, 2025). The Investment Policy Concept 2024-2029, approved in October 2024, targets 150 billion US dollars in cumulative FDI by 2029 and introduced a fully digital one-stop-shop investment platform that became effective in January 2025 (The Business Year, 2025). Foreign investors in priority sectors benefit from 10-year exemptions on corporate income and land taxes, access to 14 special economic zones, and the AIFC's English-law arbitration framework modelled on the Dubai International Financial Centre (Economy of Kazakhstan, Wikipedia, 2025).

3.2 Actor Landscape

The data center investment landscape reflects Kazakhstan's multi-vector foreign policy. At the domestic private tier, Freedom Holding Corporation, led by billionaire Timur Turlov, serves as the lead partner in the two-billion-dollar Sovereign AI Center alongside NVIDIA and OpenAI, the clearest example of domestic capital bridging state ambition and foreign technology. At the foreign investor tier, four geopolitical directions are active simultaneously. From Russia, Yandex opened a cloud region in Kazakhstan in 2024, offering localized AI toolchains (Mordor Intelligence, 2024). From China, VEON's Beeline Kazakhstan broke ground in December 2025 on a Tier III Hyper Cloud data center in Almaty built with Huawei, targeting a late-2026 launch (VEON, 2025), and China Mobile signed an agreement with Akashi Data Center in July 2025 for a Tier IV campus in Astana (Astana Times, 2025). From the Gulf, UAE-based Presight backed the national supercomputer. From Singapore, GK Hyperscale signed a hyperscale investment agreement in March 2025. Blackstone's chairman met President Tokayev in September 2024 regarding the Ekibastuz site (Data Center Dynamics, 2026). This breadth of capital from competing geopolitical blocs is unusual in emerging markets.

4 WHAT FOREIGN INVESTORS LOOK FOR

Drawing on regional comparisons with Southeast Asia and the Gulf, this paper identifies six criteria that are decisive in data center FDI decisions in markets like Kazakhstan.

Table 2: Key FDI Decision Criteria for Data Centers in Emerging Markets

Criterion	Kazakhstan Position	Competitive Benchmark
Electricity cost	$0.073/kWh (46.77% of global avg)	Singapore: ~$0.19/kWh; Germany: ~$0.23/kWh
Land availability	1,400 ha pre-zoned at Ekibastuz	Scarce in Singapore, Malaysia, UAE

Geopolitical access	Neutral; serves EU, Russia, China, Gulf	Unique advantage vs. regional peers
Tax incentives	10-yr corporate tax exemption; 14 SEZs	Comparable to Vietnam, UAE free zones
Sovereign demand	Govt mandates local data storage	Common across Central Asia
Connectivity	Trans-Caspian fiber; East-West backbone	Landlocked; improving rapidly

The most critical of these factors is electricity cost. At 0.073 US dollars per kilowatt-hour for businesses, Kazakhstan's industrial tariff is 46.77% of the world average and 68.03% of the Asian average (GlobalPetrolPrices, 2025). Electricity typically represents 40-60% of a data center's total lifecycle operating costs, making this the single most important site selection variable. Maximum tariffs were fixed through 2032 in December 2025, providing long-term cost certainty (QazaqGreen, 2025). However, the UNECE has warned that artificially low tariffs in Kazakhstan distort market signals and slow the transition to cleaner energy (UNECE, 2025). The clean energy risk is real: clean energy investment in Kazakhstan reached 1.32 billion US dollars in 2024, up 213% from 2023, yet coal still generated 75.86 TWh and accounted for roughly 89% of the electricity mix (Climatescope, 2025; GlobalPetrolPrices, 2025).

5 ECONOMIC VIABILITY AND SUSTAINABILITY

5.1 Global Market Context

The global context strongly favors data center investment. Approximately 100 gigawatts of new capacity is expected to come online between 2026 and 2030, generating roughly 1.2 trillion US dollars in real estate asset value, with tenants forecast to spend an additional one to two trillion US dollars on IT equipment (JLL, 2026). Global data center electricity demand reached around 415 terawatt-hours in 2024 and is projected to more than double to 945 TWh by 2030, roughly equivalent to Japan's current annual electricity consumption (World Economic Forum, 2025). Kazakhstan's low energy cost and abundant land place it within viable site selection criteria for a share of this investment.

5.2 Risks and Sustainability Concerns

The sustainability picture, however, is complicated on two dimensions. The first is energy. Around 89% of Kazakhstan's electricity comes from fossil fuels, primarily coal. President Tokayev has publicly framed the Ekibastuz data center campus partly as a use case for Kazakhstan's coal reserves, citing 33 billion tons sufficient for 300 years at current production rates (Data Center Dynamics, 2026). This posture is in tension with the ESG commitments embedded in the investment mandates of many European and American institutional investors, and with Kazakhstan's own Paris Agreement pledge to reduce greenhouse gas emissions by 15% by 2030 (UNCTAD, 2024). A 2025 technical analysis found that up to 30% renewable integration in Kazakhstan's grid is feasible without major structural changes, representing a plausible transition pathway if policy ambition follows (Zhaksybekov et al., 2025).

The second risk is demand adequacy. China's experience provides a cautionary parallel: MIT Technology Review reported that at least 150 of over 500 AI data center projects announced in

China in 2023 and 2024 were built well ahead of actual demand and now stand largely underutilized (MIT Technology Review, 2025). Kazakhstan's strategy of combining state workloads, domestic AI startup demand through Astana Hub, and foreign enterprise customers is the right approach to avoid this outcome, but execution will be decisive. The government's target of growing the IT workforce to 187,000 and beyond, with cloud-led services projected to grow at a 9.32% CAGR through 2031, provides a reasonable demand baseline but is not guaranteed (Mordor Intelligence, 2024).

6 WHO BENEFITS

The distribution of benefits is layered and uneven, and we argue this is the most important and underexplored question in the existing literature. At the top of the value chain, the state is an immediate beneficiary: government agencies have already allocated roughly half of the national supercomputer's capacity to public workloads, and the AI Ministry gives the state leverage over how AI infrastructure is used domestically (Data Center Dynamics, 2026). Large incumbent firms, primarily Kazakhtelecom and Freedom Holding, capture infrastructure contracts, strategic partnerships with global technology firms, and the reputational benefit of being aligned with NVIDIA and OpenAI.

Further down, benefits become more conditional. Venture funding for Kazakhstani AI startups grew from 14 million US dollars in 2023 to over 75 million US dollars in 2025, and AI accounted for more than half of all venture capital deployed in the country (Eurasianet, 2026). The IT sector employed approximately 187,000 people as of 2024, a 12% year-on-year increase, while average IT salaries rose 54% to approximately 673,000 tenge per month, driven by demand outpacing supply (Mordor Intelligence, 2024). Allianz Trade's country risk assessment flags weak governance and politically connected elite capture of new sectors as persistent structural risks (Allianz Trade, 2025).

Malaysia's experience serves as a relevant cautionary parallel. After attracting 33.7 billion US dollars in approved data center investment in 2024, Malaysia faced growing criticism for becoming primarily a physical host for foreign workloads without capturing higher-value AI activities such as model development, application building, or deep workforce transformation (Asia Society Policy Institute, 2026). Without deliberate policy to ensure technology transfer, open compute access for domestic startups and universities, and investment in advanced human capital beyond basic digital literacy training, Kazakhstan risks replicating that dynamic.

Table 3: Benefit Distribution Across Actor Tiers

Actor	Direct Benefit	Risk / Condition
State / Government	Sovereign compute, AI services	Concentration of control; governance risk
Kazakhtelecom / Freedom Holding	Infrastructure contracts, partnerships	Oligopolistic capture; limited competition
Foreign investors	Cheap energy, strategic location	ESG exposure; reputational coal risk

AI startups / SMEs	Compute access, funding growth	Conditional on open-access policy
IT workforce	Employment growth, salary increase	Talent shortage; skill mismatch risk
General population	AI public services, GDP growth	Benefit diffusion slow; enclave risk

7 METHODOLOGY

This paper employs a mixed-methods design. First, qualitative case analysis examines the five largest active projects: the Ekibastuz Data Center Valley, the Sovereign AI Center, GK Hyperscale, Beeline Hyper Cloud, and the China Mobile and Akashi campus in Astana. Second, NLP-based actor mapping will be applied to Kazakh and Russian-language government documents, regulatory filings, and corporate announcements to systematically identify which organizations appear in which roles across the infrastructure narrative. Third, corporate network analysis using Kazakhstan's national company registry will map ownership structures and reveal connections between state entities, domestic private capital, and foreign investors. Fourth, comparative case analysis drawing on Malaysia, China, and the UAE provides reference points for how emerging markets navigate the benefits and risks of large-scale data center FDI.

This paper contributes to two bodies of literature that rarely intersect: the political economy of digital industrialization in post-Soviet states, and the economics of FDI quality in emerging-market AI infrastructure. Its findings are designed to be useful both academically and in practice, as a foundation for technology and AI data center consulting, investment due diligence, and policy advisory work in the Central Asian region.

8 CONCLUSION

Kazakhstan's AI data center boom is real, well-funded, and geopolitically significant. The country holds a genuine competitive position based on cheap electricity, abundant land, a favorable incentive regime, and its unique capacity to attract investors from the United States, Russia, China, the UAE, and Singapore simultaneously. Revenue in the national data center market is projected at 324.5 million US dollars in 2024 with the Central Asian regional market growing at 18.47% CAGR through 2028, while the Ekibastuz campus alone targets 30 billion US dollars in cumulative investment (Statista, 2024; Arizton, 2024; Astana Times, 2026a).

However, three risks deserve serious attention. The first is energy sustainability: an 89% coal-dependent electricity mix increasingly conflicts with ESG expectations and Kazakhstan's own climate commitments. The second is demand adequacy: the ghost data center phenomenon in China is a direct warning against building infrastructure ahead of real utilization. The third is the concentration of benefits: without deliberate policy to ensure technology transfer, open compute access, and workforce development beyond basic digital training, Kazakhstan risks adding a new enclave sector rather than building a genuine AI economy. The state's developmental instincts are present; the quality of execution over the 2024-2026 window will determine which of these scenarios prevails.

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Determinants and Path Optimization of China–Kazakhstan Digital Services Trade Development

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Abstract

Digital technology will continue to influence how companies produce and deliver services, and therefore, digital trade will remain a key area of international economic engagement. This opportunity provides China and Kazakhstan with the chance to develop their bilateral relationship in services beyond the traditionally dominant fields of products, energy, and infrastructure. Both countries have demonstrated developing capabilities in cross-border ecommerce, digital payment systems, ICT, platform-based businesses, and related service areas. However, China-Kazakhstan digital trade development is in its infancy, and there are several practical issues (limited policy coordination, unevenly connected digital infrastructure, lower levels of market participation, and a lack of skilled personnel) that currently limit the growth of trade. It was against this backdrop that we researched the primary factors determining China-Kazakhstan digital services trade and explored various ways to create an environment to facilitate further development. We adopted a qualitative methodology incorporating literature reviews, comparative analyses, and descriptive analyses to identify possible ways to encourage the expansion of digital services trade between China and Kazakhstan. Our results demonstrate that the major contributing factors to China-Kazakhstan bilateral digital services trade include: complementary economies, developed digital infrastructures, coordinated institutions, sufficient capacities of cross-border payments and logistics, digitally enabled enterprises, and regional cooperation frameworks. Currently, the most significant contributors to the formation of bilateral digital services trade are regulatory coordination and the extent of interconnectivity of digital infrastructures, as these determine transactional efficiency, the ability to provide services, and the level of cooperation between the parties. Therefore, our argument is that both countries can usefully focus on developing their coordination policies, improving the connection of their digital infrastructure networks, increasing

the level of participation by enterprises and creating an efficient system for cross border digital services.

Keywords: Chin; Kazakhstan; digital services trade; digital economy; determinants; optimization path
JEL: F14, P45, P51

1. Introduction

The rapid advancement of digital transformation (DT) in modern economies is changing how we create, deliver, and coordinate value across borders. With regard to the exchange of goods and services, DT offers greater flexibility in transaction methods, market access, and resource allocation than traditional services trade (Yerimpasheva & Balgabayeva, 2020). Since the advent of the internet, digital platforms, cross-border e-commerce, electronic payment systems, cloud services, and ICTs have led to a significant increase in services trade. Therefore, digital services trade is viewed by many experts as a critical component of international economic cooperation, particularly as DT continues to expand rapidly worldwide.

Under the framework of the BRI, China-Kazakhstan bilateral economic cooperation has developed over several decades (Brauweiler et al., 2022). Although these two countries have established a relatively strong foundation of cooperation under this initiative in areas such as energy, manufacturing, transportation and trade; however, due to increasing advancements in their respective digital economies, the scope of this cooperative relationship is beginning to expand into additional service-oriented and technology-based sectors. Such sectors include cross-border e-commerce, digital logistics, information services, electronic payments, etc., that demonstrate a high level of potential for continued development. The fact that cooperation is expanding into additional sectors indicates that digital services trade could emerge as an important new dimension of Sino-Kazakhstani economic relationships and offer an opportunity to enhance the quality of bilateral cooperation.

Despite the potential opportunities presented by increased cooperation in digital services trade between China and Kazakhstan, the development of this sector is hindered by numerous limitations. On one side, significant difference exist between China and Kazakhstan regarding digital infrastructure, technological capabilities, market maturity and overall business environments that directly impact the operational efficiencies of cross border service delivery and collaboration. Conversely, issues such as coordination of regulations, management of data flows, convenience in making payments, availability of skilled workers/talent supply and internationalization capabilities of enterprises remain obstacles that currently limit the ability to expand bilateral digital services trade. Therefore, whether or not the future prospects of China-Kazakhstan digital cooperation will be determined by technological advancements alone remains uncertain until both parties establish a more conducive institutional and market environment. While a large body of research exists on digital trade generally, the digitalization of services trade

and regional economic cooperation; however very limited research exists focused specifically on digital services trade between China and Kazakhstan. Most existing studies examine digital economy cooperation in broader terms or the generalized effects of digitalization on trade generally. Fewer studies have explored the specific determinants and impediments to bilateral digital services trade between these two countries. Moreover, most studies do not address the interrelatedness of determining factors for development and improving future cooperation in a single cohesive framework.

Therefore, against this backdrop, this paper examines the development of China-Kazakhstan's digital services trade. Utilizing prior research and current realities of bilateral cooperation, this paper identifies major factors impacting this area of cooperation and discuss potential avenues for optimizing this process. This paper aims to contribute to a greater understanding of emerging bilateral economic cooperation through providing a clear analytical framework and to inform policy design recommendations for future developments.

2. Literature Review

Digital trade encompasses far more than just cross-border e-commerce. As defined in the Handbook on Measuring Digital Trade, digital trade refers to all international trade that is either digitally ordered or digitally delivered. Digital services trade encompasses both digital ordering of services and direct delivery of services via digital networks (International Monetary Fund et al. 2023). Similarly, based upon the above definition of digital trade, the Organisation for Economic Co-operation and Development (OECD) has indicated that the growing digitalization of the economy is changing the nature of services trade by creating additional avenues through which services may be created, distributed, and consumed internationally (OECD, 2023). Accordingly, for purposes of this study, China-Kazakhstan digital services trade is viewed as an inter-country service exchange facilitated by digital platforms, communication networks, data flow, and online payment mechanisms.

The theoretical literature provides strong empirical support for a positive causal link between digitalization and an expansion in services trade. For example, using global evidence, Jiang and Jia (2022) identified a statistically significant relationship between the level of digitalized services exported and their ability to stimulate digital services exports; however, the strength of this causal linkage varied across countries depending on the stage of development of each country's digital infrastructure. Similar results were obtained by Li et al. (2023), who demonstrated that the digital economy improves service export competitiveness through three distinct pathways: increased export size, lower prices, and greater product variety. Additionally, Kong et al. (2024) demonstrated that digital technology has a positive effect on services exports; however, this effect was most pronounced where there existed a high degree of digital openness. Collectively, these studies indicate that key drivers of digital services trade include digital infrastructure, technology adoption, market readiness and digital openness.

In contrast to prior studies, another important area of research focuses more on institutions, regulations and trade facilitation. Lopez-Gonzalez et al. (2023) argue that stronger digital connections not only expand trade opportunities but also reduce transaction costs associated with trade, particularly if regulatory barriers inhibiting cross border transactions are removed. This view is consistent with the OECD Services Trade Restrictiveness Index which indicates that continued fragmentation of regulatory regimes and restriction on market access continues to inhibit the international trading of digitally-enabled services. Based upon data from the Digital Trade Integration Database, Ferracane et al. (2026) concluded similarly that the removal of restrictive measures is insufficient to ensure the successful integration of digital trade into national economies unless complemented by supportive policy frameworks facilitating efficient operation of enterprises across national boundaries. Furthermore, Gupta et al. (2022) found that restrictions on cross-border data flows negatively affect exports of Information Communication Technology (ICT) services; while Zhao et al. (2024) demonstrated that deeper digital trade rules positively influence bilateral trade in services value-added. Collectively, these findings illustrate that digital services trade is driven not solely by technological innovation and market forces but also by rules making processes, policy predictability and quality of regulatory environment.

Finally, a third area of study has focused on the regional dimensions of digital trade -- notably those related to the Belt and Road Initiative (BRI) and Eurasian cooperation. Wang and Zhu (2024) found that trade facilitation significantly improved China's digital products exports to BRI partner countries with infrastructure quality and customs efficiency being particularly influential factors. More broadly from a Eurasian perspective, Sahakyan (2024) suggested that the Digital Silk Road has presented new opportunities for cooperative engagement between China and EEU member states; however institutional gaps and differences in technological capabilities create significant impediments to such cooperation. Specifically, Li (2024) indicated that a solid foundation exists for Sino-Kazakhstani cooperation given the shared experience of participating in the larger process of global digital transformation; thus cooperation in areas such as digital economy governance, digital infrastructure and digital society development offers potential for growth. Finally, Zhang (2024) found that China's model of digital trade has developed through interactions among competing interests, competing ideas and institutions; hence China's bilateral digital cooperation is influenced by both economic incentives and differing models of governance and policy preferences.

Although these previous studies have provided valuable insights regarding Chinese-Kazakhstani cooperation in general terms such as digital economy partnerships, the Digital Silk Road and regional digital governance they do not adequately analyze the structure, limitations and developmental requirements necessary to achieve effective digital services trade between the two countries. Further, most previous studies examined infrastructure, institutions, market demand and firm capacity independently whereas this study will develop an integrated analytical framework combining these elements. Thus, this study identifies a void in existing literature focusing on developing actionable recommendations for improving Sino-Kazakhstani digital services trade.

Therefore, against this background this study builds on existing literature but shifts its focus towards analyzing China-Kazakhstan bilateral digital services trade. Therefore this study analyzes how joint combinations of economic conditions, digital infrastructure, institutional coordination, trade facilitation and enterprise participation contribute to the development of bilateral Sino-Kazakhstani digital services trade. This study seeks to provide a comprehensive analysis of this topic while providing a practical base for identifying optimal pathway development in Sino-Kazakhstani context.

3. Methods

This research combines qualitative analysis with a short description of the relevant data. Because publicly accessible information lacks a comprehensive, sequential, comparable, and measurable database on the bilateral digital services trade between China and Kazakhstan, estimates of the value of this trade cannot be developed due to unclear statistical boundaries and limited data availability. Therefore, instead of conducting an econometric regression based on bilateral digital services trade values, this research will select a set of proxy variables that capture the conditions necessary for the growth of digital services trade and use them for a comparative evaluation of China and Kazakhstan.
Regarding the selected variables, the research focuses on four dimensions. The first dimension is economic scale, measured by Gross Domestic Product (GDP), which reflects market size, the potential customer base for services, and a business's capacity to deliver services. The second dimension is digital access, measured by the percentage of Internet users of the total population, representing how well residents and businesses have access to digital services. The third dimension is transaction security, measured by the number of secure Internet servers per one million people, indicating the technical infrastructure for online transactions and the provision of digital services. The fourth dimension is mobile connectivity, measured by mobile cellular subscription per 100 people, reflecting the foundational requirements for mobile platforms, digital payment systems, and digital consumption systems. The above-mentioned variables relate to the principal factors underpinning the development of digital services trade, enabling cross-country comparisons year to year.

The primary data source for this research was the World Bank's World Development Indicators. Most recently updated data were accessed via the FRED (Federal Reserve Economic Data) platform. Data regarding GDP, Internet usage rates, and secure Internet servers were available until 2024. Mobile cellular subscription data was last available in 2023. Three steps are involved in analyzing the data. First, trends in the various variables are compared over the years 2020 – 2024 (and/or 2020 – 2023 dependent upon data availability). Second, changes in each variable during the sample time frame are quantified so that the direction and speed of development may be assessed. Finally, cross-country comparisons at the end of the sample time frame are utilized to evaluate both the operational bases and significant obstacles affecting digital services trade development between China and Kazakhstan. While this methodology does not constitute a

formal econometric testing procedure, it does provide a valuable factual basis for developing arguments and optimizing policies within subsequent sections of the paper.

Table 1. Selected Proxy Variables for China and Kazakhstan

Indicator	China (start)	China (end)	Kazakhstan (start)	Kazakhstan (end)
GDP (current USD, bn)	14,996.4 (2020)	18,743.8 (2024)	171.1 (2020)	291.5 (2024)
Internet users (% of population)	70.05 (2020)	92.00 (2024)	85.94 (2020)	93.39 (2024)
Secure internet servers (per 1 million people)	948.46 (2020)	1,413.32 (2024)	3,184.10 (2020)	6,914.14 (2024)
Mobile cellular subscriptions (per 100 people)	120.50 (2020)	128.25 (2023)	124.70 (2020)	127.12 (2023)

Data source: World Bank (World Development Indicators), retrieved via Federal Reserve Economic Data (FRED).

Based on the findings presented in the Table 1, economic scale alone is not indicative of digitalized infrastructure when comparing economies using relative measures. China has a dominant position in terms of total economic size; however, Kazakhstan performed comparably to or even better than China in several digital metrics using per-capita measurements. Consequently, the table provides evidence supporting the assertion that both countries continue to advance along paths of digital transformation; however, each uses fundamentally distinct structural models for their advancement: China through large-scale expansion and widespread adoption, and Kazakhstan through high degrees of relative digital penetration and infrastructure density.

4. Results

The results are based on proxy indicators rather than direct bilateral digital services trade data. The methodology decision aligns with the approach adopted in this study: rather than estimating bilateral digital trade values, the study focuses on factors that make such trade more or less likely. The five Figures collectively indicate that there is currently a sufficient basis for co-operation between China and Kazakhstan in digital services; their advantages do differ. China's strength comes primarily through its large domestic market, while Kazakhstan performs relatively better in several measures of access conditions and conditions for conducting digital transactions.

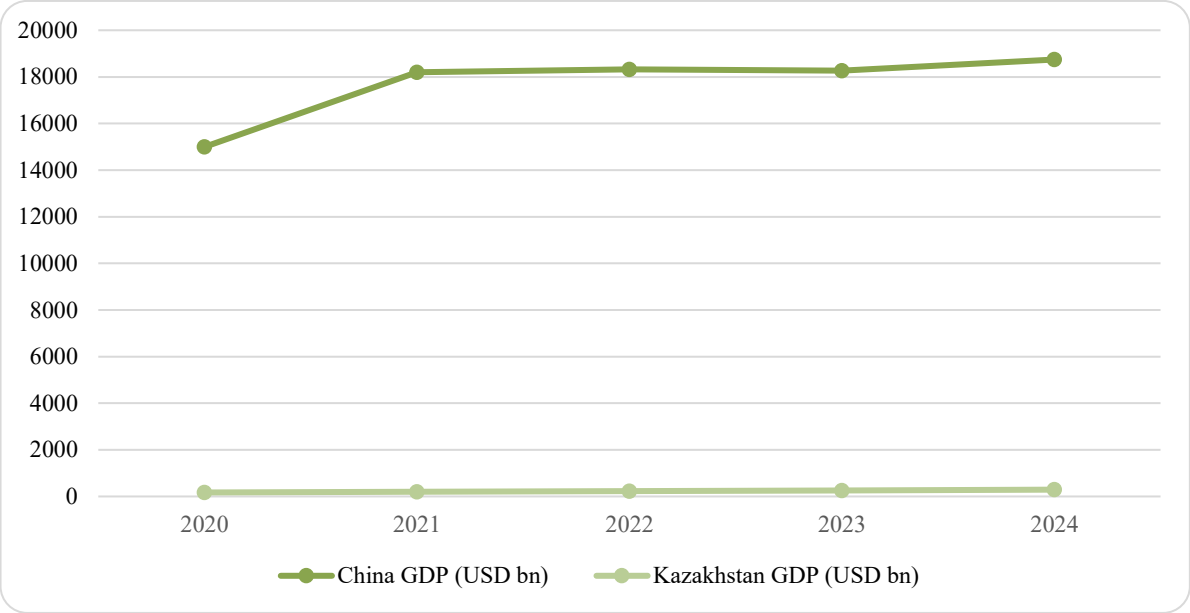


Figure 1. GDP scale comparison (current USD, billions) Source Compiled based on the World Bank database.

A comparison of economic scales indicates a significant disparity between China and Kazakhstan. While China's GDP grew from approximately $14.996 trillion in 2020 to $18.744 trillion in 2024, Kazakhstan's GDP grew from $171.08 billion to $291.48 billion in the same interval (see Figure 1). Though Kazakhstan's economy is significantly smaller in absolute value, its growth rate during the sample period was greater. This provides some evidence that the development of China-Kazakhstan digital services trade is occurring in an unbalanced economic context. China possesses a significant advantage in terms of platform size, service production capability, and domestic demand; Kazakhstan is stronger in relation to being a regional gateway market, an application-oriented market, and an organizational basis for coordinating institutions. Therefore, differences in economic size may lead to a development relationship in which China plays a stronger role as a provider of capacity, market expansion, and regulatory coordination, relative to parallel growth.

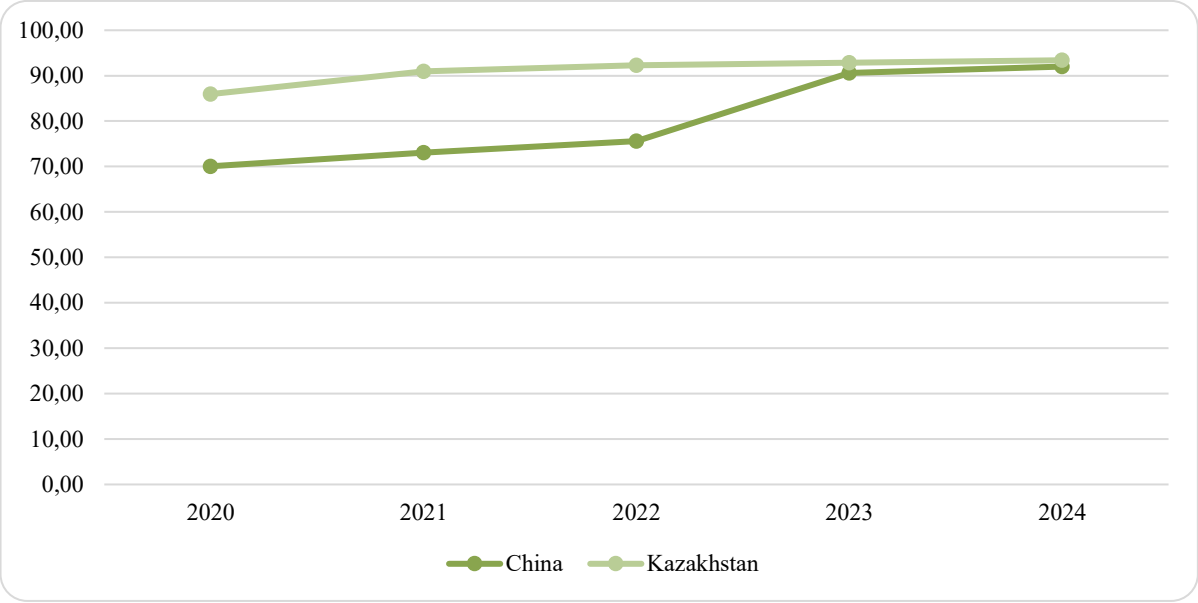


Figure 2. Internet Users (% Population) Source Based on World Bank Data.

Both countries have relatively good levels of access to digital technology. The percentage of internet users in China rose from 70.05% in 2020 to 92.00% in 2024; the percentage for Kazakhstan rose from 85.94% to 93.39% (See Figure 2). Throughout the sample period, Kazakhstan had slightly higher percentages of users; nevertheless, both countries achieved a very high level of connectivity at the end of the sample period. This result is important since it implies that the major barrier to bilateral digital services trade cannot be attributed solely to lack of basic Internet access. Rather, at this point the major issue is whether cross border payments, settlement mechanisms, cross border regulatory co-ordination, and service delivery can operate efficiently once users have established access. Stated another way, although the access base for users is largely in place, the critical factor now is how effectively the cross border service ecosystem uses this base.

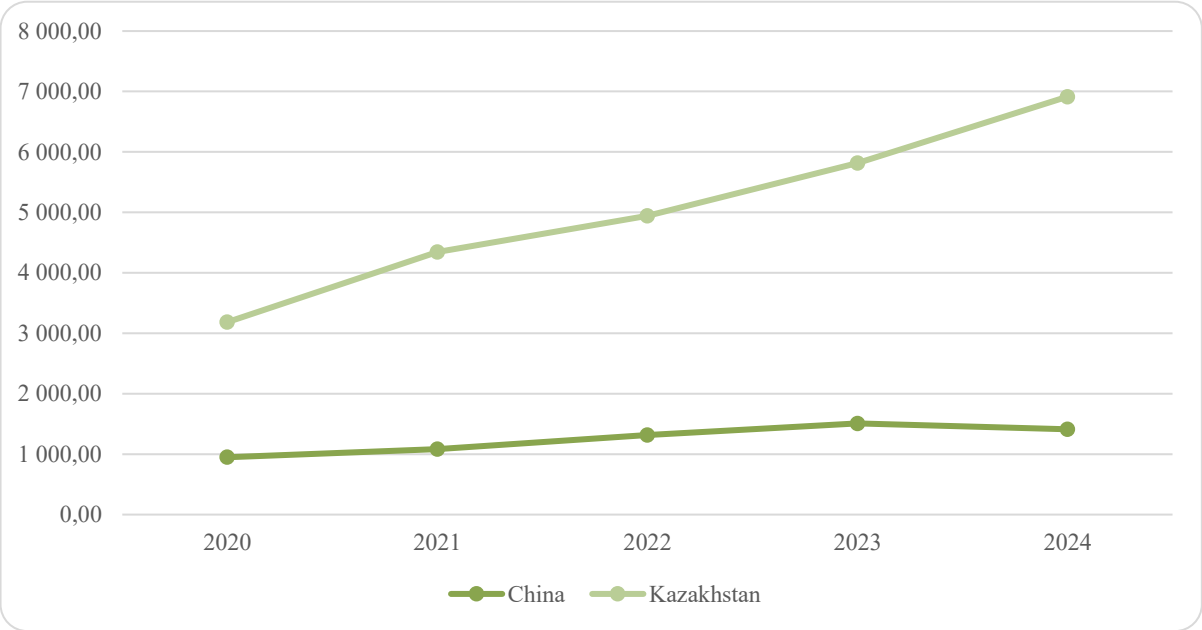


Figure 3. Secure internet servers (per 1 million people) Source Compiled based on the World Bank database.

This situation changes somewhat when we analyze transaction security and the overall environment for delivering digital services. Kazakhstan performed substantially better than China on the measure of secure Internet servers per one million inhabitants, and experienced greater increases over time. As of 2024, China had 1,413.32 secure servers per million people, whereas Kazakhstan had 6,914.14 (See Figure 3). During the period reviewed here, both countries showed improvements; however, the increase was much steeper on the Kazakh side. This finding is important since it demonstrates that Kazakhstan should not be viewed as inferior to China in all aspects of digital infrastructure. At least on a per capita server density basis, it does not appear to be at a disadvantageous position. Consequently, these findings imply that the constraints on developing China – Kazakhstan digital services trade are probably not due entirely to infrastructural shortcomings. It is more probable that the real impediments lie in areas such as cross border payment mechanisms, regulatory co-ordination, acceptance of platform rules by firms, ability of firms to engage internationally and the establishment of agreements regarding cross border movement of data.

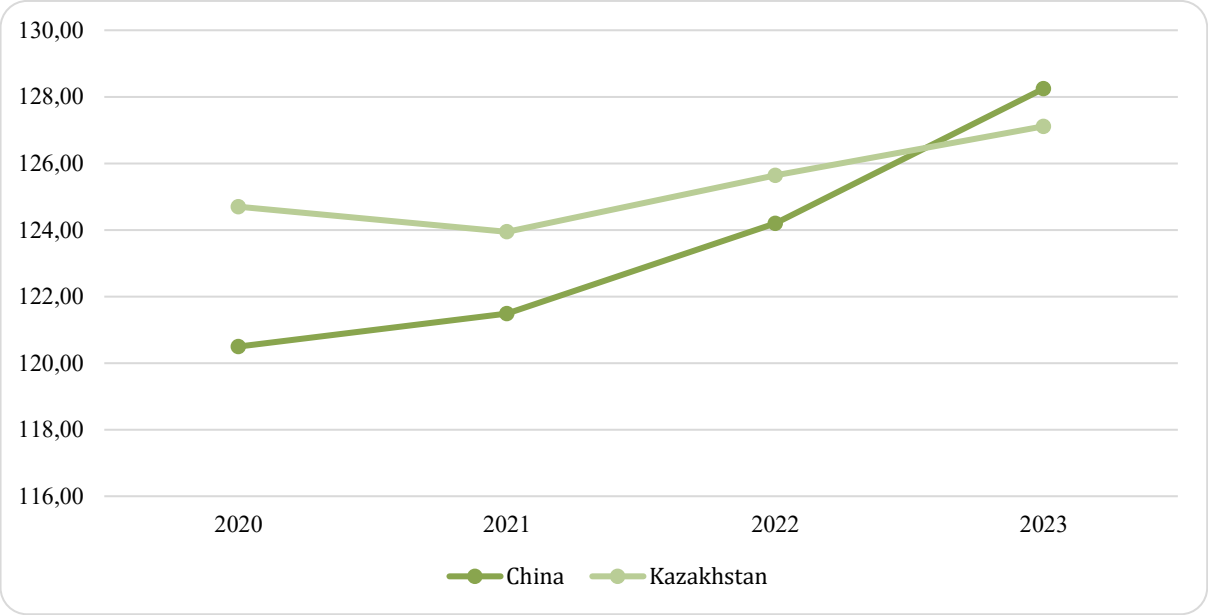


Figure 4. Mobile cellular subscriptions (per 100 people) Source Compiled based on the World Bank database.

Mobile connectivity presents a slightly different picture, as both countries have extremely high penetration. By 2023, China had achieved a mobile cellular subscription rate of 128.247 per 100 inhabitants, and Kazakhstan a rate of 127.115, resulting in a small difference in terms of the number of subscribers (Fig. 4). Both rates were significantly higher than the threshold of 100 subscribers per 100 inhabitants and thus indicate repeated and widespread use of mobile communication technologies. Therefore, for digital services trade, this is important as it identifies potential foundations for mobile platforms, social commerce, mobile payment, etc. combined with the indicators related to internet usage suggest that future growth in China-Kazakhstan's digital services trade will be determined by converting an existing customer base from being 'connected' to using digital services efficiently, reliably and compliantly across borders.

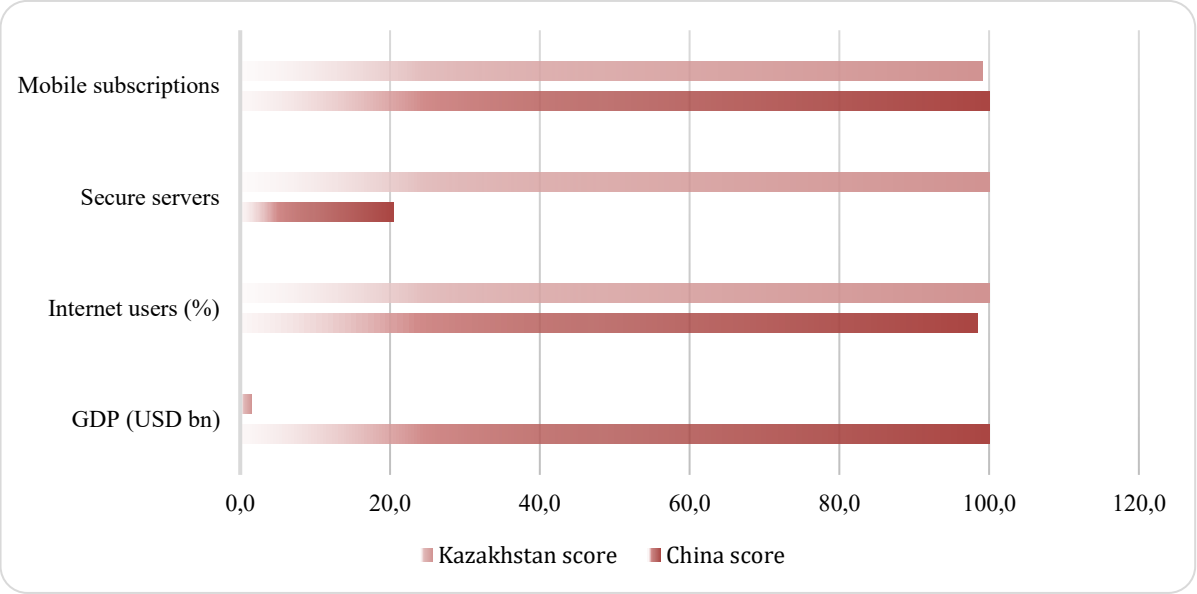


Figure 5. Latest-year normalized comparison (max within indicator = 100) Source Compiled based on the World Bank database.

In addition to presenting an overview of the differing aspects of the digital economies of China and Kazakhstan illustrated in figures 1-4, Figure 5 provides a simple way to visualize the extent to which there are differences across both countries in their ability to facilitate the exchange of digital services; or put another way, the relative strength of their respective positions in all of the areas described above. To create this image, we have taken the most recent available value for each indicator and converted it into a score. In doing so, the highest-scoring country has been given a score of 100. The comparison of the four indicators on the same scale clearly shows that there is no uncertainty about which country will have an advantage in exchanging digital services. In fact, the only remaining question is by how much China will establish itself ahead of Kazakhstan. Although the gap in economic production value between China and Kazakhstan appears significant, the other three indicators (internet usage, mobile phone subscribers, and secured web servers) are very close. This makes using the most current data for each of the four figures (Figures 1-4) to create Figure 5, useful since it provides a single point of reference for comparing all four of these individual exchanges. Figure 5 demonstrates that although China and Kazakhstan are approaching equivalent levels of basic digital connectivity requirements, a greater disparity persists between the two countries in terms of scale. Furthermore, although China appears to remain far ahead of Kazakhstan in overall economic size, it also appears to have a smaller competitive edge in the more infrastructure-related measures. Thus, in practical terms, this reinforces our contention that going forward, policymakers should focus more on facilitating greater institutional coordination and ensuring cross-border service compatibility, rather than spending time worrying about providing people with basic levels of digital access. The conclusions drawn in this paper

were derived from the most recently available data on GDP, Internet use, secure servers, and mobile subscriptions presented in Figures 1–4.

The evidence suggests that understanding why digital services trade occurs between China and Kazakhstan requires examining the underlying factors that drive this trade at two distinct levels. First, there are fundamental supporting elements that provide the foundation for digital services trade activities. Examples include market size, Internet penetration rates, mobile phone connectivity, and the level of security offered by an online environment. Second, there are critical limiting factors that act as barriers to the creation of opportunities for digital services trade. Some examples of these limiting factors include regulatory coordination and harmonization among governments, synchronization of payment and logistics systems, the depth of cooperation among platforms used for commerce transactions, service offerings provided by companies themselves, and adherence to compliance rules. The empirical analysis conducted in this study demonstrates that China and Kazakhstan currently share a high level of alignment in foundational support for digital services trade. Therefore, in light of this finding, the primary challenge facing policymakers moving forward is not whether or not basic levels of digital access exist, but rather what steps need to be taken to convert that basic access into more advanced forms of institutional connectivity and more effective cross-border service ecosystems.

5. Conclusion

This article focuses on the influencing factors and path optimization of the development of China-Kazakhstan digital service trade. Based on sorting through theories and existing research on digital service trade, combined with the actual situations of China and Kazakhstan in economic development, digital infrastructure, and network connectivity capacity in recent years, the bilateral digital development basis, main constraints, and optimization direction of service trade are analyzed. Research shows that, in the background of the continuous promotion of global digital transformation, digital service trade is becoming a new extension of bilateral economic and trade cooperation, and China-Kazakhstan cooperation is also gradually expanding from traditional goods trade, energy cooperation, and infrastructure connectivity to digital platforms, information services, cross-border payment, and digital logistics. Exhibition.

China has clear advantages in terms of economic scale and industrial system, while Kazakhstan has unique location advantages in regional connectivity and Central Asian market radiation. At the same time, the Internet penetration rate and mobile communication infrastructure in the two countries are relatively strong, providing the necessary conditions for the development of digital service trade. In contrast, institutional coordination and infrastructure interconnection are particularly important at this stage. They are not only related to transaction costs and service efficiency but also greatly affect enterprises' enthusiasm and stability in participating in bilateral digital cooperation.

This paper shows that the optimization of digital service trade between China and Kazakhstan should not stop at the level of principled initiatives, but should promote more operational

institutional and market coordination around the shortcomings of reality. Specifically, we can continue to make efforts in the following directions in the future: first, strengthen the communication of digital trade-related policies, and gradually promote the connection of rules in electronic authentication, cross-border payment, digital supervision and data governance; second, improve the level of digital infrastructure interconnection, and further improve cross-border network, platform access, Digital logistics and supporting service capabilities; Third, support enterprises to improve their digital management and cross-border service capabilities, and enhance the depth of participation of platform enterprises, science and technology enterprises and service-oriented small and medium-sized enterprises in bilateral cooperation; Fourth, rely on the joint construction of the "Belt and Road" and regional cooperation mechanism to promote China-Kazakhstan digital cooperation to gradually shift from project-based promotion. Institutionalized and systematic development. Only by combining institutional coordination, facility connectivity and enterprise capacity improvement can we more effectively unleash the cooperation potential of China- Kazakhstan digital service trade.

The research in this article also has certain limitations. Because the direct statistics of bilateral digital service trade are still not complete enough, this article adopts more methods of open macro indicators, comparative analysis and literature induction for research, so the portrayal of some sub-industries and micro-subjects is still not deep enough. Future research can further introduce bilateral digital service trade sub-item data, enterprise-level cases or panel data analysis methods on the basis of improved data conditions, and conduct a more detailed examination of the impact mechanism, so as to provide more accurate empirical basis and policy support for China-Kazakhstan digital service trade cooperation.

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FROM FUNCTIONALITY TO EXPERIENCE: HOW EMOTIONAL DESIGN AND GAMIFICATION DISRUPT TRADITIONAL LEARNING IN THE DIGITAL ERA

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ABSTRACT

This paper using empirical evidence, examines how emotional design and gamification are contributing to the digital learning from functionality towards experience. The research uses Norman's three-level theory of emotional design (visceral, behavioural, reflective) combining it with gamification system to form the Tri-Level Experiential Learning Design (TELD) framework. The empirical component synthesizes data from twelve meta-analyses published between 2018 and 2025, large-scale platform data (Duolingo, Kahoot!, Khan Academy, Coursera, MOOC cohorts), and industry and regional data from Kazakhstan and China. The data from multiple sources includes more than 250 primary studies and several million learners. Across the behavioural layer, gamification produces medium-to-large positive effects on academic performance (Hedges' g = 0.46–0.82) and on affective and behavioural outcomes (g = 0.36–0.74). Across the visceral layer, emotional design produces small-to-medium effects on retention (g = 0.35–0.39), transfer (g = 0.27–0.33) and perceived difficulty reduction (g = −0.21). Across the reflective layer, effects are the most theoretically abundant but empirically thinnest: avatar-identity and Proteus effects yield r = 0.22–0.26, while narrative effects on declarative knowledge are inconsistent. Moderator analyses reveal that duration, age group, cultural context and design integration shape outcomes heavily, with a full three-layer TELD design showing g = 1.285 versus g = −3.162 for decorative design lacking mechanics (Li, Ma, & Shi, 2023). These findings align with the claim that experience-oriented digital learning environments enhance the effect and more effective than the content-centric systems, also, providing the reasons why they seem ineffective. The paper summarizes implications for Kazakh higher education and proposes further study for a longitudinal TELD-integrated intervention in Central Asia.

KEYWORDS: emotional design, gamification, learning experience design, TELD framework, meta-analysis, digital transformation of education, Kazakhstan higher education

1 INTRODUCTION

Traditionally, the concept behind the educational technologies was designed to present and store the learning content efficiently, by sustaining the administrative process altogetherThe digital transformation and revolution had a deep impact on learning systems, from technical functionality to learner experience. Traditionally, the concept behind educational technologies was designed to present and store the learning content efficiently, by sustaining the administrative process altogether. However, nowadays, such functionality-oriented systems compete with highly engaging digital environments that are explicitly designed to attract attention, sustain motivation and shape identity through experience. The gap between conventional learning-management systems and platforms such as Duolingo, Kahoot!, Khan Academy, along with the AI-driven teaching and learning systems, demonstrates this shift altogether: nowadays the learners are increasingly interacting with the environments that are built around aesthetic appeal, immediate micro-feedback, moderated challenge and user-centred interaction, rather than around the simple content repositories.

Two research traditions have converged on this transformation, but have developed largely in parallel. Emotional design research, rooted in Norman (2004) and extended into multimedia learning by Um, Plass, Hayward and Homer (2012), Plass, Heidig, Hayward, Homer and Um (2014) and Mayer and Estrella (2014), has examined how aesthetics, colour, shape and anthropomorphism affect learners' affect, cognitive load and learning outcomes. Ongoing studies and research in education gamification, which was structured by Deterding, Dixon, Khaled and Nacke (2011) and advanced by Hamari, Koivisto and Sarsa (2014) and Sailer and Homner (2020), emphasised points, streaks, leaderboards, badges, avatars and narrative mechanics as stimuli for motivation and behavioural engagement. Yet the two traditions remain weakly integrated, and traditional instructional design has continued to prioritise content delivery over experience staging. The purpose of this paper is to address this gap on empirical grounds. First, the paper proposes the Tri-Level Experiential Learning Design (TELD) framework, which integrates emotional design and gamification within Norman's (2004) three-level structure of visceral, behavioural and reflective experience. Secondly, it combines different data and empirical evidence from peer-reviewed twelve meta-analyses, large-scale platform data, industry and market data and regional evidence from Kazakhstan and China to actually test whether experiential digital learning produces measurable gains on learning outcomes, motivation and engagement. This combined research also points out to certain conditions under which such gains make true impact, therefore the framework can provide practical educational guidance responsibly.

The paper is organised as follows. Section 2 sets out the theoretical background of the TELD framework. Section 3 describes the empirical synthesis methodology. Section 4 reports the findings, organised by the three TELD levels and by cross-cutting moderators. Section 5 discusses implications, critical boundary conditions, and regional relevance for Kazakh higher education. Section 6 concludes with a research agenda for a longitudinal Central Asian TELD intervention.

2 THEORETICAL BACKGROUND

2.1 Norman's Three Levels of Emotional Design

Norman (2004) distinguishes three levels of emotional response to designed artefacts. The visceral level concerns first impressions, sensory appeal and the immediate affective response to an artefact. The behavioural level concerns usability, responsiveness, interaction quality and performance feedback. The reflective level concerns meaning, identity and the way a product becomes part of the user's self-narrative. In learning environments, these three levels correspond respectively to how a system looks and feels on first contact, how it performs during interaction and what kind of learner identity it helps construct over time.

2.2 Gamification Mechanics Mapped to the Three Levels

Gamification introduces game-design elements into non-game contexts and can be mapped onto Norman's structure. At the visceral level, mechanics include mascots, thematic worlds, anthropomorphic characters, colour palettes and audiovisual cues. At the behavioural level, they include points, streaks, leaderboards, adaptive difficulty, immediate feedback and variable rewards. At the reflective level, they include avatars, narrative, skill trees, quests, mastery systems and badges-as-credentials. The integration of emotional design and gamification across these three levels generates a broader learner-experience architecture than either approach can produce separately.

2.3 Psychological Foundations of the TELD Framework

The TELD framework is grounded in several psychological theories. The aesthetic-usability effect (Tractinsky, Katz, & Ikar, 2000) and affective computing (Picard, 1997) explain why attractive and emotionally resonant interfaces reduce perceived effort at the visceral level. Flow Theory (Csikszentmihalyi, 1990) and Self-Determination Theory (Ryan & Deci, 2020) explain why immediate feedback, optimal challenge and meaningful progression sustain behavioural engagement. Control-Value Theory (Pekrun, 2006, 2024), identity-based motivation and the Peak-End heuristic explain why learning experiences become meaningful at the reflective level. Cognitive-load theory (Sweller, 2010; Paas & Sweller, 2014) cuts across all three layers by specifying the conditions under which emotional and gamified elements facilitate rather than displace learning.

The TELD framework therefore makes a falsifiable claim: gamified and emotionally designed learning environments should produce measurable gains over traditional content-centric systems, and these gains should be distributed across three mediator clusters — extraneous-load reduction and positive-activating affect at the visceral level, competence and flow at the behavioural level, and autonomy, relatedness and identity at the reflective level. The empirical section tests this claim.

3. METHODOLOGY

This paper adopts an empirical synthesis design. Rather than reporting primary fieldwork, it aggregates quantitative evidence from three complementary tiers of source material and maps every finding onto the three levels of the TELD framework.

The first tier consists of peer-reviewed meta-analyses and systematic reviews published between 2018 and 2025 in leading educational-technology journals, including Educational Psychology Review, Educational Research Review, British Journal of Educational Technology, Computers & Education, Computers in Human Behavior and Educational Technology Research and Development. Twelve meta-analyses are incorporated, covering more than 250 primary studies and an aggregate sample of learners exceeding one hundred thousand. Effect sizes are reported as Hedges' g or Cohen's d with 95 per cent confidence intervals where available.

The second tier consists of platform-scale and large-cohort data. This includes the HarvardX–MITx Person-Course open dataset (N = 1.7 million MOOC participants), Duolingo's investor-relations disclosures (116.7 million monthly active users in Q4 2024), Kahoot!'s public adoption data, Khan Academy's SRI Education evaluation report (Murphy, Gallagher, Krumm, Mislevy, & Hafter, 2014) and the Lampropoulos and Sidiropoulos (2024) three-year longitudinal study in higher education (N = 1,001).

The third tier consists of industry and regional data. Market figures are drawn from HolonIQ, Fortune Business Insights, Grand View Research, Global Industry Analysts and Mordor Intelligence. Regional evidence for Kazakhstan includes Davletova et al. (2026, N = 236 Master's students across five Kazakh pedagogical universities), BilimLand coverage data and Kundelik.kz usage statistics. Regional evidence for China includes Li, Ma and Shi (2023), Zou (2020) and recent empirical work on Chinese English-as-a-Foreign-Language contexts.

Each empirical finding is coded against the TELD cell it populates — visceral, behavioural or reflective — and against the mechanic involved (for example colour and anthropomorphism at the visceral layer, points–leaderboards–feedback at the behavioural layer, avatars–narrative–mastery at the reflective layer). Null and negative findings are coded separately as boundary conditions. Because the effect-size distribution is heterogeneous (typical I^2 values between 83 and 94 per cent), the synthesis prioritises moderator analyses and confidence intervals over single pooled means.

4. RESULTS

4.1 Visceral Level: Emotional Design Effects

Evidence at the visceral level is the most replicated segment of the TELD matrix. Um et al. (2012) reported that combined warm colours and rounded anthropomorphic shapes produced d = 0.80 on both comprehension and transfer (N = 118). Plass et al. (2014) replicated the effect across two experiments (d = 0.61 and d = 0.77 on comprehension) and isolated shape as the primary driver of the effect. Mayer and Estrella (2014) further reduced perceived task difficulty by d = 0.49. The

meta-analysis by Brom, Stárková and D'Mello (2018), covering eighteen studies with 2,924 participants, estimated $d+ = 0.387$ ($p < 0.001$) for retention, $d+ = 0.317$ for comprehension and $d+ = 0.327$ for transfer. Wong and Adesope's (2021) replication and extension of that meta-analysis reported $g+ = 0.35$ for retention, $g+ = 0.27$ for transfer, $g+ = 0.29$ for comprehension and $g+ = -0.21$ for perceived difficulty. Wang, Mayer, Han and Zhang (2023, N = 100) demonstrated that combining two emotional-design features (colour and anthropomorphism) yielded $d = 0.73$ on positive-activating emotion and $d = 0.64$ on transfer — the single-feature design was inferior to the dual-feature design. Kaifeng and Pengbo (2024) subsequently reported SMD = 0.28 to 0.31 for facial-anthropomorphism effects on transfer and retention in a 2024 meta-analysis.

A critical boundary condition applies at this layer. When emotional decoration is extraneous rather than intrinsically integrated, it produces the seductive-details effect: Harp and Mayer (1998) and the meta-analysis by Rey (2012) report small-to-medium negative effects ($d = 0.30$ to 0.93 against decoration) on transfer, with the penalty largest for low-prior-knowledge learners. Visceral-level design therefore works when integrated with the content, and fails when it merely decorates.

The aggregate visceral-level evidence is summarised in Table 1.

Table 1 Visceral-Level Effect Sizes: Emotional Design Features in Multimedia Learning

Study (APA 7)	Outcome	Effect size	Sample / k
Um et al. (2012)	Comprehension; Transfer	$d = 0.80$; $d = 0.80$	N = 118 (single RCT)
Plass et al. (2014)	Comprehension	$d = 0.61$; $d = 0.77$ (two exp.)	Two experiments, ~N = 80 each
Mayer & Estrella (2014)	Comprehension; Perceived difficulty ↓	$d = 0.61$–0.77; $d = 0.49$	Replication studies
Brom, Stárková, & D'Mello (2018)	Retention; Comprehension; Transfer	$d+ = 0.387$; 0.317; 0.327	k = 18; N = 2,924
Wong & Adesope (2021)	Retention; Transfer; Comprehension; Perceived difficulty	$g+ = 0.35$; 0.27; 0.29; −0.21	k = 16–38
Wang, Mayer, Han, & Zhang (2023)	Transfer (2 features combined)	$d = 0.64$–0.73	N = 100
Kaifeng & Pengbo (2024)	Transfer; Retention (anthropomorphism)	SMD = 0.28; 0.31	Meta-analysis
Rey (2012)	Seductive details (boundary)	$d = 0.30$–0.93 against decoration	Meta-analysis

4.2 Behavioural Level: Gamification Mechanics and Performance

The behavioural layer is where meta-analytic evidence converges most strongly. Sailer and Homner (2020) reported g = 0.49 (95 per cent CI 0.30–0.69) on cognitive achievement, g = 0.36 (0.18–0.54) on motivation and g = 0.25 (0.04–0.46) on behavioural outcomes across nineteen studies. Bai, Hew and Huang (2020) obtained g = 0.504 (0.284–0.723) across thirty interventions and 3,202 learners. Huang et al. (2020), analysing thirty interventions with 3,083 learners, reported g = 0.464 (0.244–0.684) on overall learning outcomes. Ritzhaupt et al. (2021) disaggregated affective and behavioural outcomes and found g = 0.574 on affect and g = 0.740 on behaviour. Yıldırım and Şen (2021) reported g = 0.557 on academic achievement across forty-five studies and 3,487 learners. Kim and Castelli (2021) obtained d = 0.48 on behaviour change, with the critical moderator that a brief intervention yielded d = 1.57 while a year-long intervention inverted to d = −0.20.

More recent meta-analyses incorporating larger corpora have produced larger pooled effects. Li, Ma and Shi (2023) reported g = 0.822 (0.567–1.078) on learning across forty-one studies with 5,071 learners. Zeng, Sun, Looi and Fan (2024), covering studies from 2008 to 2023 in the British Journal of Educational Technology, reported g = 0.782 on academic performance across twenty-two studies. Barz, Benick, Dörrenbächer-Ulrich and Perels (2024) reported g = 0.67 on cognitive and g = 0.32 on affective-motivational outcomes across thirty-five digital game-based learning studies in K–12 settings (N = 7,139). Triantafyllou, Sapounidis and Stamovlasis (2025) reported g ≈ 0.73 for gamification effects on computational thinking across sixty-seven studies. Liang et al. (2025) reported g = 0.962 (0.688–1.235) for mobile-game-based language learning across thirty-eight studies and 4,102 learners. The K–12 motivation meta-analysis of Kurnaz and Koçtürk (2025) reported g = 0.654 (0.442–0.866) across forty-one studies.

The disaggregated evidence on specific mechanics shows that competition–collaboration combinations are the most robust positive moderator (Sailer & Homner, 2020), that immediate feedback is repeatedly identified as the single most important element across randomised controlled trials (Mazeas, Duclos, Pereira, & Chalabaev, 2022), and that points, levels and leaderboards in isolation significantly raise behavioural performance but do not affect intrinsic motivation, autonomy or competence (Mekler, Brühlmann, Tuch, & Opwis, 2017, N = 273). Critical boundary conditions are documented. Hanus and Fox (2015, N = 71 versus 71) reported that a sixteen-week gamified course reduced intrinsic motivation and produced lower final-exam scores than the control. Bai, Hew, Sailer and Jia (2021) reported that low-ranked learners on leaderboards suffered reductions in learning performance, intrinsic motivation and engagement. Zou (2020, Hong Kong, N = 277 primary students over one year) reported that ranked leaderboards discouraged bottom-ranked students, with face-preservation concerns amplifying the effect in an East Asian sample.

The aggregate behavioural-level evidence is summarised in Table 2.

Table 2 Behavioural-Level Effect Sizes: Gamification Mechanics Across Meta-Analyses

Meta-analysis / study	Outcome	Pooled effect size (95% CI)	Studies / sample
Sailer & Homner (2020)	Cognitive; Motivational; Behavioural	g = 0.49; 0.36; 0.25	k = 9–19; N up to 2,246
Bai, Hew, & Huang (2020)	Achievement	g = 0.504 (0.284–0.723)	k = 30; N = 3,202
Huang et al. (2020)	Learning outcomes	g = 0.464 (0.244–0.684)	k = 30; N = 3,083
Ritzhaupt et al. (2021)	Affective; Behavioural	g = 0.574; g = 0.740	k = 13–19; N up to 1,974
Yıldırım & Şen (2021)	Academic achievement	g = 0.557	k = 45; N = 3,487
Kim & Castelli (2021)	Behaviour change (brief vs. long)	d = 0.48 pooled; 1.57 brief; −0.20 long	k = 18
Li, Ma, & Shi (2023)	Learning; Full-MDA moderator	g = 0.822; g = 1.285 (full TELD)	k = 41; N = 5,071
Zeng, Sun, Looi, & Fan (2024)	Academic performance	g = 0.782 (I^2 = 94%)	k = 22
Barz et al. (2024)	Cognitive; Affective-motivational	g = 0.67; g = 0.32	k = 35; N = 7,139
Kurnaz & Koçtürk (2025)	Motivation (K–12)	g = 0.654 (0.442–0.866)	k = 41
Triantafyllou et al. (2025)	Computational thinking	g ≈ 0.73	k = 67; N = 3,634
Liang et al. (2025)	Mobile-game language learning	g = 0.962 (0.688–1.235)	k = 38; N = 4,102

4.3 Reflective Level: Identity, Narrative and Self-Determination

The reflective layer is theoretically rich but empirically thinner than the other two. Li, Hew and Du's (2024) self-determination-theory-grounded meta-analysis of thirty-five gamified interventions (N ≈ 2,500) is the strongest current synthesis. It reports g = 0.638 (0.139–1.136) on autonomy, g = 1.776 (0.737–2.814) on relatedness (with wide confidence intervals due to small k) and only g = 0.277 (0.001–0.553) on competence, providing direct meta-analytic evidence against pointification. Sailer, Hense, Mayr and Mandl (2017, N = 419 of 699 in a 2×2×2 randomised

controlled trial) dissociated specific mechanics onto specific needs: avatars, story and teammates satisfied relatedness, while badges, leaderboards and performance graphs satisfied competence and task meaningfulness.

Avatar-identity effects are documented by Ratan, Beyea, Li and Graciano's (2020) meta-analysis of the Proteus effect (r = 0.22–0.26 across forty-six studies), with Beyea et al. (2023) showing significantly stronger effects in virtual-reality contexts. Birk, Atkins, Bowey and Mandryk (2016, N = 126) and Birk and Mandryk (2018) demonstrated that avatar customisation raises intrinsic motivation, autonomy and immersion, and reduces attrition in longitudinal self-improvement programmes. Narrative effects are more ambiguous. Armstrong and Landers (2017, N = 273) found that narrative in gamified training improved satisfaction and reactions (d = 0.65) but had no significant effect on declarative knowledge. Adams, Mayer, MacNamara, Koenig and Wainess (2012) reported that in short-timeframe tests, slideshows outperformed narrative games on retention (d = 1.37 in favour of the slideshow). Hamari, Shernoff, Rowe, Coller, Asbell-Clarke and Edwards (2016, N = 173) showed that challenge — not immersion — was the strongest predictor of perceived learning via engagement, anchoring the active ingredient of flow as challenge–skill balance rather than narrative immersion per se.

The reflective-level evidence is summarised in Table 3.

Table 3 Reflective-Level Effect Sizes: Identity, Narrative and Self-Determination

Study (APA 7)	**Mechanism**	**Effect size**	**Sample / design**
Sailer et al. (2017)	Avatars, story, teammates → relatedness; badges, leaderboards → competence	Sig. positive paths	N = 419; 2×2×2 RCT
Ratan et al. (2020)	Proteus effect (avatar identity)	r = 0.22–0.26	k = 46 meta-analysis
Beyea et al. (2023)	Proteus effect in VR	Significantly stronger than flat-screen	k = 56
Birk et al. (2016)	Avatar customisation → intrinsic motivation, autonomy, immersion	Significant positive path coefficients	N = 126 RCT
Birk & Mandryk (2018)	Avatar customisation → attrition reduction	Sig. reduced attrition	Longitudinal field study

Li, Hew, & Du (2024)	Autonomy; Relatedness; Competence	g = 0.638; 1.776; 0.277	k = 35; N ≈ 2,500
Armstrong & Landers (2017)	Narrative → satisfaction; declarative knowledge	d = 0.65; n.s.	N = 273
Adams et al. (2012)	Narrative vs. slideshow (retention)	d = 1.37 in favour of slideshow	Short-task RCT
Hamari et al. (2016)	Challenge → engagement → learning	β sig.; immersion n.s.	N = 173

4.4 Integrated TELD Effect Matrix

Table 4 integrates the three layers into the central TELD matrix, showing the distribution of effect sizes across mechanics and outcome types. The matrix reveals two patterns of practical importance. First, behavioural mechanics concentrate in a medium-to-large effect-size range across outcomes, while visceral and reflective mechanics cluster in a small-to-medium range but operate on distinct mediators (cognitive load and affect at the visceral layer; autonomy, relatedness and identity at the reflective layer). Second, the largest moderator effect in the literature is the integration moderator reported by Li, Ma and Shi (2023): a fully integrated mechanics-dynamics-aesthetics design produces g = 1.285, while dynamics and aesthetics without mechanics produces g = −3.162. This single contrast is the strongest quantitative argument in the literature for integrated tri-level design over any single-layer approach.

Table 4 Integrated TELD Effect Matrix: Layers × Mechanics × Outcomes

TELD layer	**Primary mechanics**	**Outcome cluster**	**Typical g / d**	**Canonical source**
Visceral	Warm colour + rounded anthropomorphic shapes	Retention; Transfer; Comprehension	g = 0.27–0.39	Brom et al. (2018); Wong & Adesope (2021)
Visceral	Dual-feature emotional design	Positive-activating affect; Transfer	d = 0.64–0.80	Wang et al. (2023); Um et al. (2012)
Visceral	Cognitive-load mediation	Perceived difficulty ↓	g = −0.21	Wong & Adesope (2021)

Behavioural	Points + feedback + leaderboards	Achievement; Motivation; Behaviour	g = 0.46–0.82	Sailer & Homner (2020); Huang et al. (2020); Li, Ma, & Shi (2023)
Behavioural	Competition + collaboration combo	Behavioural engagement	Largest positive moderator	Sailer & Homner (2020)
Behavioural	Isolated points/levels/leaderboards	Intrinsic motivation; Autonomy	Null (d ≈ 0)	Mekler et al. (2017)
Reflective	Avatar + narrative + teammates	Relatedness; Autonomy	g = 0.638–1.776	Li, Hew, & Du (2024); Sailer et al. (2017)
Reflective	Avatar identity (Proteus effect)	Behavioural conformity; Self-efficacy	r = 0.22–0.26	Ratan et al. (2020); Beyea et al. (2023)
Reflective	Narrative alone (short tasks)	Declarative knowledge	n.s. or negative	Armstrong & Landers (2017); Adams et al. (2012)
Cross-layer	Full MDA (integrated TELD)	Learning	g = 1.285	Li, Ma, & Shi (2023)
Cross-layer	Dynamics + aesthetics without mechanics	Learning	g = −3.162	Li, Ma, & Shi (2023)

4.5 Platform-Scale Evidence: Traditional vs. Experiential Learning

Platform-scale data translate effect sizes into ecological outcomes. MOOC completion rates collapsed from approximately 6 per cent in 2014–2015 to 3.13 per cent in 2017–2018, with 52 per cent of registrants never starting the course (Reich & Ruipérez-Valiente, 2019, Science; HarvardX–MITx Person-Course dataset, N = 1.7 million). Against this baseline, gamified platforms show radically different engagement signatures. Duolingo reported 116.7 million monthly active users and 40.5 million daily active users in Q4 2024, with approximately 55 per cent next-day retention and a median of fifteen minutes of daily engagement (Duolingo Investor Relations, 2024). Vesselinov and Grego (2012) estimated that thirty-four hours of Duolingo use is equivalent to one university semester of Spanish; Jiang, Rollinson, Plonsky, Gustafson and Pajak (2021, N = 225, Foreign Language Annals) showed that beginner Duolingo users reached ACTFL Intermediate-

Low reading and Novice-High listening — equivalent to four university semesters — in approximately half the time.

Lampropoulos and Sidiropoulos (2024, Education Sciences, N = 1,001) reported in a three-year longitudinal higher-education study that the gamified condition retained 42 per cent more students than online-only instruction and 36 per cent more than traditional instruction, with success rates 39 per cent and 13 per cent higher respectively, excellence rates 130 per cent and 23 per cent higher, and final grades 24 per cent and 11 per cent higher. Kahoot! reports more than eleven billion cumulative participants across more than two hundred countries, adoption in approximately 75 per cent of United States K–12 schools and use at 97 per cent of Fortune 500 companies. Wang and Tahir's (2020) systematic review of ninety-three studies confirms positive effects on learning performance, classroom dynamics and anxiety reduction. Khan Academy serves more than 180 million registered users across more than 190 countries; the SRI evaluation (Murphy et al., 2014) reported 85 per cent teacher satisfaction but only 25 per cent rating the platform very effective for struggling students — a boundary condition consistent with the cognitive-load literature.

4.6 Market, Adoption and Post-Pandemic Scale

The shift from functionality to experience is also visible at the market level. The global EdTech market was valued at approximately USD 182.5 billion in 2025 and is projected to reach USD 688 billion by 2034 at a compound annual growth rate of 15.6 per cent (Fortune Business Insights, 2025). HolonIQ estimates global EdTech expenditure at USD 404 billion by 2025 within an overall education market projected to reach USD 10 trillion by 2030. The gamification-in-education segment was valued at USD 3.5 billion in 2024 and is projected to reach USD 14.3 billion by 2030 at a compound annual growth rate of 26.6 per cent, with the Chinese segment forecast at USD 4.2 billion by 2030 at 33.5 per cent — the highest regional rate (Global Industry Analysts, 2025). Corporate e-learning reached USD 401.5 billion in 2025 and is projected to reach USD 929 billion by 2030; approximately 52 per cent of learning-management platforms now include gamification features.

The pandemic shock accelerated adoption. UNESCO (2020) documented that more than 1.5 billion learners, approximately 90 per cent of enrolled students across 194 countries, were affected at peak. Duolingo's monthly active users scaled from approximately thirty-seven million in Q3 2020 to more than 130 million by early 2025; Coursera's registered learners grew from seventy-seven million in 2020 to 168.2 million by the end of 2024. At the same time, global EdTech venture capital peaked at USD 20.8 billion in 2021, then collapsed to USD 2.4 billion in 2024 (HolonIQ), indicating that consolidation rather than expansion is now the strategic challenge for the sector.

4.7 Regional Evidence: Kazakhstan and Central Asia

The Kazakhstan context warrants explicit anchoring. BilimLand / Bilim Group covers approximately 70 per cent of the country's school education processes, with more than three million

students and roughly three hundred thousand registered teachers. Kundelik.kz connects more than 6,500 schools, serves more than four million regular users and generates 350 million monthly page views. Davletova et al. (2026, Frontiers in Education, N = 236 Master's students across five pedagogical universities) reported $\eta^2 = 0.46$ for digital-competence gains from an integrated gamification, microlearning and collaborative-projects intervention. Shubayeva et al. (2026) document that Kazakh secondary students respond most strongly to competitive elements, while tertiary students prefer simulation and project-based gamification — a culturally specific moderator. Coursera (2025) reports that 56 per cent of Kazakh Coursera learners are female and that Uzbekistan leads the world with 6.25 per cent of its labour force active on Coursera.

Chinese evidence provides a comparative lens. Li, Ma and Shi (2023) reported $g = 1.293$ for elementary gamification and $g = 0.869$ for higher-education gamification in Chinese samples, consistently exceeding Western effect sizes. Diaz and Estoque-Loñez (2024) pooled $g = 1.30$ across Asian studies. At the same time, Zou (2020) documented that ranked leaderboards were culturally demotivating for bottom-ranked students in Hong Kong, with face-preservation concerns amplifying the downside risk. Taken together, the Kazakh and Chinese evidence suggests that collectivist achievement orientation amplifies competition-based behavioural-level effects, while face-preservation norms sharpen the risk of public individual leaderboards. Competition–collaboration combinations, rather than isolated competition, are therefore more culturally transferable in Central and East Asian samples.

5. DISCUSSION

The empirical synthesis supports three defensible conclusions. First, the convergent meta-analytic evidence supports moderate-to-large positive effects of gamification on learning outcomes ($g \approx 0.46$–0.82 on achievement, $g \approx 0.36$–0.74 on affect and behaviour) and small-to-medium effects of emotional design on retention, transfer and cognitive load ($g \approx 0.21$–0.39). Pooled means are policy-relevant, but moderators dominate: duration, age group, cultural context and design integration shape outcomes decisively. Second, the three TELD layers map onto three theoretically and empirically distinct mediator clusters: extraneous-load reduction and positive-activating affect at the visceral layer (Brom et al., 2018; Wong & Adesope, 2021); competence satisfaction and flow through challenge–skill balance at the behavioural layer (Sailer et al., 2017; Hamari et al., 2016); and autonomy, relatedness and identity at the reflective layer (Li, Hew, & Du, 2024; Ratan et al., 2020). This tri-mediator structure is the framework's strongest empirical claim. Third, boundary conditions must be integral to the framework. Novelty decay, pointification failure, leaderboard demotivation for low performers, seductive-details costs, and duration-related attenuation (college students and year-long interventions) are all documented at effect sizes that can invert the aggregate benefit when design is misaligned.

Li, Ma and Shi's (2023) moderator analysis supplies the cleanest quantitative case for integrated tri-level design: full Mechanics–Dynamics–Aesthetics yields $g = 1.285$, whereas Dynamics and Aesthetics without Mechanics yields $g = -3.162$. In TELD terms, visceral and

reflective design without behavioural mechanics are worse than no intervention at all. Conversely, behavioural mechanics without visceral integration (pointification without aesthetic or identity meaning) drift toward null effects on intrinsic motivation (Mekler et al., 2017). The integrated tri-level design is therefore not an additive convenience but an empirical necessity.

For Kazakh higher education, the implications are specific. Kundelik.kz and BilimLand already provide national-scale behavioural-level infrastructure. The empirical gap is at the reflective layer, where avatar identity, narrative and mastery systems remain under-deployed. Given Davletova et al.'s (2026) strong results on integrated interventions, and given Shubayeva et al.'s (2026) finding that Kazakh tertiary learners prefer simulation and project-based gamification, a tri-level TELD pilot in a Kazakh university context is both empirically warranted and culturally appropriate. Competition–collaboration combinations rather than isolated public leaderboards are recommended, given the Zou (2020) evidence on face preservation in East Asian samples.

Methodological caveats are acknowledged. Heterogeneity above 80 per cent is endemic across the gamification literature; Dichev and Dicheva's (2017) review found twenty-six of forty-one gamification experiments methodologically inconclusive. Orsoni et al. (2025) propose a methodological checklist — theory articulation, element specification, motivation and engagement measurement, and preregistration — that future TELD-based empirical work should adopt. Industry-sourced platform figures (Duolingo investor disclosures, Prodigy white papers, Vesselinov and Grego's 2012 report) are treated as ecologically suggestive rather than causally established, and market-sizing firms are named rather than used as settled fact.

6. CONCLUSION

This paper has argued, on empirical grounds, that the disruption of traditional learning in the digital era is best understood as a shift from functionality-oriented instructional design to experience-oriented learner design, and that the shift is most productively analysed through the Tri-Level Experiential Learning Design framework. Twelve meta-analyses, platform-scale data covering several hundred million learners, and regional evidence from Kazakhstan and China jointly show that emotional design and gamification produce measurable gains in retention, comprehension, transfer, performance, motivation and engagement when they are integrated across the visceral, behavioural and reflective layers. The same evidence shows that isolated single-layer design — decorative aesthetics without mechanics, or pointification without identity and meaning — produces null or negative effects.

The practical implication for educational technology is that future systems should not be designed merely to function efficiently. They should be designed to engage learners emotionally at the visceral layer, structure interaction and progression at the behavioural layer, and support identity and meaning at the reflective layer. The most important research gap is at the reflective layer, where narrative, avatar identity and mastery systems remain the thinnest empirical segment of the TELD matrix. The most important regional gap is Central Asia, where the global meta-

analytic literature is structurally under-represented. These two gaps converge on a single concrete research agenda: a preregistered, longitudinal TELD-integrated intervention in a Kazakh higher-education sample, comparing a reflective-only, a behavioural-only, and a full tri-level TELD condition, would simultaneously address the framework's weakest empirical seam, the region's documented representation gap and the duration-moderator anomaly that remains the largest unresolved question in the gamification literature. This is the direction of the author's next study.

7. ACKNOWLEDGEMENTS

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INTERNATIONALISATION OF HIGHER EDUCATION IN KAZAKHSTAN: POLICY CHALLENGES OF LINGUISTIC AND ACADEMIC ADAPTATION OF CHINESE STUDENTS UNDER THE 2023–2029 DEVELOPMENT CONCEPT

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ABSTRACT

This paper conducts a conceptual and policy analysis of the linguistic and academic adaptation challenges faced by Chinese students in Kazakhstan in the framework of the Concept for the Development of Higher Education and Science of the Republic of Kazakhstan for 2023–2029, approved by Government Resolution No. 248 of 28 March 2023. The Concept implies a quite ambitious goal: indicator 7 poses an expectation to raise the share of foreign students from 7.1 per cent in 2023 to 10 per cent by 2029, against a lower line of approximately 35,075 incoming students from 88 countries in the 2025–2026 academic year. China is the fourth largest source country (3,367 students), behind only India, Turkmenistan and Uzbekistan, and a substantial share of these students are ethnic Kazakhs from the Xinjiang Uyghur Autonomous Region. Drawing on Knight's (2004) framework of internationalisation rationales, Berry's (1997, 2005) acculturation model, Cummins' (2008) BICS / CALP distinction, Marginson, Nyland, Sawir and Forbes-Mewett's (2010) student-security architecture, and Altbach's (1981, 2016) centre–periphery analysis, the paper argues that the Concept is sets great aspiriations, yet underdeveloped infrastructure wise for the Chinese-student case. The aspiration is articulated almost entirely in empiric and interchangeable terms (branch campuses, scholarships, the Study in Kazakhstan portal); operational provision for the triple linguistic burden of Russian, Kazakh and English, for the Confucian-heritage versus post-Soviet pedagogical systems mismatch, for sociocultural integration beyond academic collaboration, and for institutional support beyond visa-and-registration compliance is largely absent from the Concept text. Policy recommendations include a mandatory pre-sessional Russian-and-Kazakh programme for non-CIS international students, a faculty development scheme proportionate to the branch-campus expansion, dedicated intercultural-mentor and mental-health roles in international offices, and an annual reporting indicator for the Ministry of Science and Higher Education that disaggregates retention and satisfaction by source country.

KEYWORDS: internationalisation of higher education, Chinese students, Kazakhstan, 2023–2029 Concept, linguistic adaptation, sociocultural adaptation, BICS / CALP, Berry acculturation, Belt and Road Initiative, policy analysis

1. INTRODUCTION

The internationalisation of higher education in Kazakhstan has undergone some major changes and upgrades of the post-2022 reform cycle. The 2022 presidential decree splitting the former Ministry of Education and Science created a separate Ministry of Science and Higher Education, and the new ministry's first major strategic document the Concept for the Development of Higher Education and Science for 2023–2029, approved by Government Resolution No. 248 of 28 March 2023 placed internationalisation in Paragraph 4 of Chapter 1 as one of five anchor priorities for the sector. Indicator #7 of the Concept commits the system to raising the share of foreign students in the total student body from 7.1 per cent in 2023 to 10 per cent by 2029, with intermediate annual targets of 7.5, 8.0, 8.2, 8.5 and 9.0 per cent (Government of the Republic of Kazakhstan, 2023). Against the baseline of approximately 624,500 students enrolled in 113 higher education institutions in 2024–2025, the 10 per cent target translates into roughly 62,000–75,000 arriving students, and ministerial communications have at times re-stated the ambition in absolute terms of up to 150,000 international students by 2029 (ICEF Monitor, 2025; The PIE News, 2024).

China matters disproportionately in this aspiration. In the 2025–2026 academic year, 35,075 international students from 88 countries were enrolled in Kazakhstan (Ministry of Science and Higher Education of the Kazakhstan Republic, 2025); among them, 3,367 came from the People's Republic of China, the fourth-largest cohort after India (9,959), Turkmenistan (9,089) and Uzbekistan (4,136), and ahead of the Russian Federation (2,426). The Chinese cohort matters not because of its current absolute size but because three structural conditions converge on it: the Belt and Road Initiative explicitly identifies education exchange as a soft-power channel and underwrites scholarship infrastructure (Shih & Cao, 2022); Kazakh universities are price-competitive against Western alternatives at less than one-quarter of typical Western tuition (CAPS Unlock, 2025); and Kazakhstan's October 2023 ratification of the Tokyo Convention on the recognition of qualifications in the Asia-Pacific signals a deliberate pivot toward Asian source markets (Ministry of Science and Higher Education of the Kazakhstan Republic, 2023). The asymmetry of the bilateral flow, approximately 20,000 Kazakhstani students in China against 3,367 Chinese students in Kazakhstan — is also politically visible to Astana.

The literature on internationalisation in Kazakhstan has been productive but uneven. Sagintayeva and others have documented the macro-policy architecture (Hartley, Gopaul, Sagintayeva, & Apergenova, 2016; Jumakulov, Ashirbekov, Sparks, & Sagintayeva, 2019), Akkari, Seidikenova, Bakitov and Minazheva (2023) have traced the gap between political will and implementation, and a substantial body of work has examined trilingual education and English-medium instruction (Goodman & Karabassova, 2018; Goodman & Kambatyrova, 2022; Sarmurzin

et al., 2023; Tajik, Akhmetova, Fillipova, Shamatov, & Zhunussova, 2023; Manan, Tajik, & Hajar, 2024). The specific question of how non-CIS, non-Russophone international students — and Chinese students in particular — adapt linguistically, socioculturally and academically inside the Kazakh system has, however, been only sparsely addressed. Zharkynbekova, Tazhibayeva, Shakhputova, Agabekova, Azamatova and Kuzar (2024) is the most directly relevant empirical study, but it focuses on ethnic-Kazakh repatriates from Mongolia and China rather than on Han-Chinese students.

The purpose of this paper is to address that gap on conceptual and policy grounds. It poses one principal research question: how does the 2023–2029 Concept conceptualise and where does it fail to realize its aspirations, linguistic and academic adaptation support for Chinese students whose recruitment is implied by the 10 per cent target? The paper makes three contributions. First, it integrates five established theoretical frameworks — Knight (2004) on internationalisation rationales, Berry (1997, 2005) on acculturation, Cummins (2008) on academic-language proficiency, Marginson et al. (2010) on student security, and Altbach (1981, 2016) on centre–periphery and the imperial tongue — into a single analytical lens calibrated for the Kazakhstan-China context. Second, it reads the Concept against this lens and identifies seven structural policy gaps. Third, it offers five evidence-anchored recommendations for the next iteration of the Concept and for institutional implementation.

2. THEORETICAL BACKGROUND

2.1 Knight's Rationales of Internationalisation

Knight (2004) defines internationalisation as the process of integrating an international, intercultural or global dimension into the purpose, functions and delivery of higher education, and distinguishes four rationales operating at both national and institutional levels: academic, cultural and social, economic, and political. The four rationales are not mutually exclusive, but they impose competing design constraints. An academic rationale prioritises curriculum quality, faculty exchange and joint research; an economic rationale prioritises tuition revenue, branch-campus expansion and labour-market signalling; a political rationale prioritises soft power, diplomatic positioning and bilateral signalling; a cultural and social rationale prioritises mutual understanding, intercultural competence and citizenship. Knight (2008) and de Wit (2024) have subsequently warned that economic and political rationales tend to dominate national policy documents while the academic and cultural rationales receive thinner operational treatment, producing what de Wit (2024) terms 'everything that quacks is internationalisation' a syndrome in which heterogeneous and sometimes contradictory activities are bundled under one banner.

2.2 Berry's Acculturation Framework

Berry (1997, 2005) frames adaptation to a host culture as the joint outcome of two orthogonal preferences: the desire to maintain one's heritage culture and the desire to engage with the host culture. The four resulting strategies — integration, assimilation, separation and marginalisation are associated with different levels of acculturative stress, with integration consistently linked to the lowest stress and marginalisation to the highest. Ward and Kennedy (1999) operationalised the sociocultural-adaptation construct in a widely used scale that has been deployed in dozens of subsequent studies of international students. Lai, Wang and Ou (2022) report that Chinese students in the United States most frequently adopt a separation strategy characterised by strong co-national networks and weaker host-culture engagement and that academic adaptation is consistently the weakest of the three adaptation outcomes (sociocultural, psychological and academic). Galchenko and van de Vijver (2007) report similar patterns for Chinese students in Russia, where Russian language proficiency is the strongest single predictor of sociocultural adaptation.

2.3 Cummins' BICS / CALP Distinction

Cummins (1979, 2008) distinguishes Basic Interpersonal Communicative Skills (BICS), the conversational fluency typically attained within one to two years of immersion, from Cognitive Academic Language Proficiency (CALP), the language register required for academic reading, writing, lecture comprehension and assessment, which typically requires five to seven years of sustained development. The distinction is critical for international-student policy because surface-level conversational ability does not predict academic readiness. For Chinese students entering a Kazakh higher education institution where instruction is delivered primarily in Russian and in many cases supplemented by Kazakh-language and English-medium streams the CALP burden is multiplied across two and sometimes three host languages simultaneously. The literature on translanguaging in Kazakhstan (Goodman & Tastanbek, 2021) documents that classroom code-switching among Russian, Kazakh and English is the lived reality of higher education even where official policy presumes language separation, but no published study has examined how Chinese students navigate this multilingual classroom.

2.4 Marginson and Colleagues on Student Security

Marginson, Nyland, Sawir and Forbes-Mewett (2010) reframe international student welfare as a question of human security covering nine domains: financial, work, housing, language, cultural, legal, immigration, personal safety and health. Sawir, Marginson, Forbes-Mewett, Nyland and Ramia (2012) document that the language-security domain is the most consistent predictor of broader insecurity, and that students in non-Anglophone host environments — including those in Russophone universities — frequently form dense co-national networks as a substitute for inadequate institutional support. The framework supplies a pastoral counterpart to Knight's structural categorisation: where Knight asks why a country pursues internationalisation, Marginson et al. ask whether the international student is safe, supported and able to learn once enrolled.

2.5 Altbach on Centre, Periphery and the Imperial Tongue

Altbach (1981, 2016) argues that global higher education exhibits a structural centre–periphery pattern: a small number of research-intensive universities and a small number of dominant academic languages — primarily English — set the standards, supply the journals and capture the prestige, while peripheral systems either align with the centre or risk further marginalisation. Goodman and Kambatyrova (2022) extend this argument to Kazakhstan, showing that English in Kazakh higher education is simultaneously framed as necessary (for global ranking, publication, mobility) and irrelevant (for local employment, classroom communication and most students' actual lives), generating what they term 'linguistic injustice'. For the Chinese-student case, the relevant question is whether Kazakhstan, in attempting to escape its own peripheral position vis-à-vis Western higher education, risks becoming peripheral in turn to Chinese Belt and Road educational soft power.

Figure 1 integrates these five frameworks into a single analytical scheme used throughout this paper. The Concept's aspirational indicator sits at the apex; four adaptation domains occupy the middle layer; Chinese student outcomes sit at the bottom. Knight's rationales bracket the analysis on the left; Altbach's centre–periphery on the right.

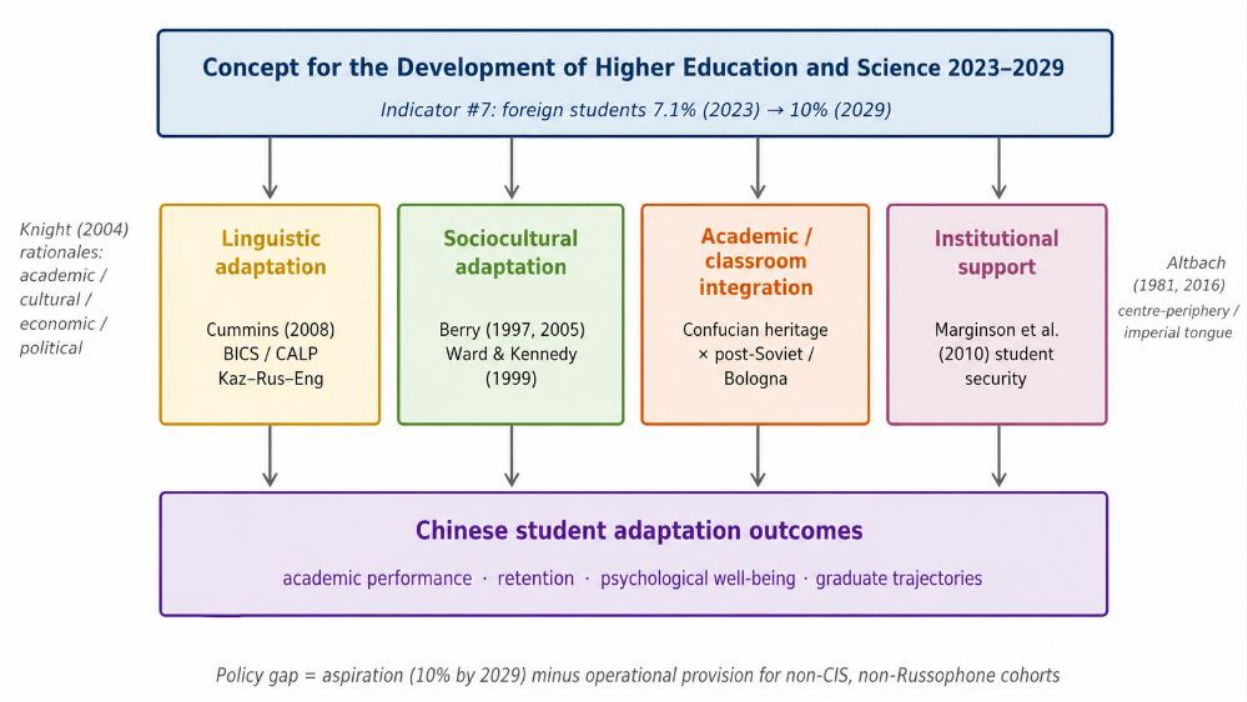


Figure 1: Integrated conceptual framework for Chinese student adaptation under the 2023–2029 Concept

3. METHODOLOGY

This paper adopts a conceptual and policy-analysis design rather than primary fieldwork. The streucture consists of three tiers of source material, each examined through the integrated framework of Section 2.

The first tier is the primary policy text. The Concept for the Development of Higher Education and Science of the Republic of Kazakhstan for 2023–2029 (Government Resolution No. 248 of 28 March 2023, with amendment No. 471 of 14 June 2024) is read in the original Russian via the official adilet.zan.kz repository. Particular attention is paid to Section 2 (current-situation analysis), Section 3 (international experience review), Chapter 1 of Section 5 (development of higher and post-graduate education), Paragraph 4 of that chapter (internationalisation), and Section 6 (target indicators), with all translations made by the author and identified as such where directly cited. Adjacent policy documents include the State Programme for the Implementation of Language Policy 2020–2025, the predecessor Strategy for the Internationalisation of Higher Education to 2025, and Bolashak / Centre for International Programmes communications.

The second tier is the secondary academic literature. High quality academic articles are prioritised, including publications in the Journal of Studies in International Education, Higher Education, Studies in Higher Education, the International Journal of the Sociology of Language, the Asia Pacific Education Review, the Journal of Multilingual and Multicultural Development, Frontiers in Sociology, Frontiers in Psychology and the European Education series. Adjacent-context studies on Chinese student adaptation in Russia, the United States, Malaysia and the United Kingdom are included where Kazakh-context evidence is absent, with the limitation that inference across contexts is treated as suggestive rather than confirmatory.

The third tier is institutional, statistical and journalistic material. Bureau of National Statistics yearly higher-education bulletins, Ministry of Science and Higher Education press communications, OECD reviews of Kazakhstan, the World Education News and Reviews country profile, the ICEF Monitor and PIE News market intelligence, and Astana Times reporting are used for current statistics and policy commentary, with academic sources triangulating any analytic claim drawn from them. The China–Global South Project, CAPS Unlock and Inform.kz coverage of Chinese students in Kazakhstan is treated similarly.

Three caveats apply. First, public sources state two different numerical aspirations for 2029 — the Concept text fixes the share at 10 per cent, while ministerial communications have variously stated absolute targets of 100,000 (PIE News, 2024) and 150,000 international students (ICEF Monitor, 2025; Ministry of Science and Higher Education of the Kazakhstan Republic, 2025); the discrepancy is itself a finding and is treated as such. Second, the cohort labelled 'Chinese students' in Kazakh statistics is heterogeneous, including Han Chinese, ethnic Kazakhs from China (qandas), and other ethnic minorities; the paper distinguishes these where the source material allows. Third, no Q1 or Q2 study has yet examined Han-Chinese student adaptation in Kazakhstan, so the framework is calibrated using closely adjacent literature on Chinese students in Russia (Galchenko

& van de Vijver, 2007; Wang et al., 2025) and on ethnic-Kazakh repatriates from China (Zharkynbekova et al., 2024).

4. RESULTS

4.1 Policy Aspirations and the Numbers Gap

The Concept frames internationalisation in unambiguously expansionary terms. Indicator #7 sets the share of foreign students at 7.1 per cent in 2023, 7.5 per cent in 2024, 8 per cent in 2025, 8.2 per cent in 2026, 8.5 per cent in 2027, 9 per cent in 2028 and 10 per cent in 2029 (Government of the Republic of Kazakhstan, 2023, Section 6). Indicator #6 commits 70 per cent of Kazakh higher education institutions to international programmes and academic exchanges by 2029, up from 40 per cent in 2023. The Concept also commits to opening at least 12 branches of prestigious foreign universities by 2029 — a target already exceeded, with 23 foreign branch campuses operating by 2025, including Cardiff, De Montfort, Coventry, Anhalt, Woosong, Queen's University Belfast, Hong Kong PolyU, MEPhI and MGIMO (ICEF Monitor, 2025). The Concept further commits to launching a 'Study in Kazakhstan' online consultation portal and to expanding the scholarship programme for foreign citizens, which admitted 550 students at 16 institutions in the 2021–2022 academic year (Government of the Republic of Kazakhstan, 2023, Section 2; Bolashak.gov.kz, 2025).

The implementation record against indicator #7 is mixed. The actual foreign-student trend is shown in Figure 2: 21,727 students in 2018, peaking at 39,558 in 2019, dropping to 29,069 during the COVID-19 disruption in 2020, rising again to 43,164 in 2022, then settling at 27,756 in 2023 (4.4 per cent of the student body) before climbing to 35,075 from 88 countries in 2025–2026. The Chinese sub-cohort has grown more slowly, from approximately 1,500 in 2018 to 2,100 in 2024 and 3,367 in 2025–2026 (Astana Times, 2025; CAPS Unlock, 2025; Inform.kz, 2025). To reach the 10 per cent indicator on the 2024–2025 enrolment base of 624,500 students, the system would need approximately 62,500 inbound students by 2029 — almost double the 2025 baseline. Ministerial communications restating the target as 150,000 (ICEF Monitor, 2025) imply more than a four-fold expansion in four years, against a Chinese cohort that grew by approximately 60 per cent across an entire decade.

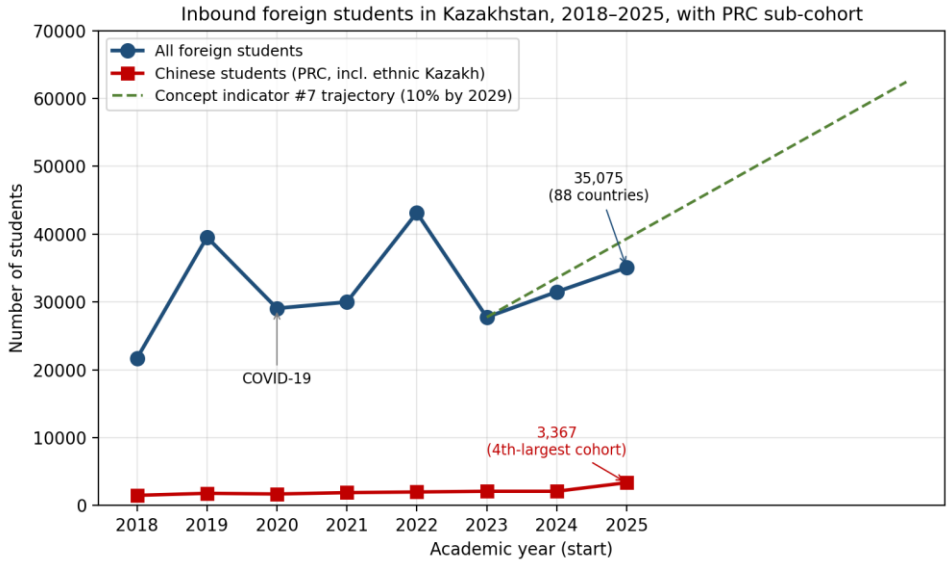


Figure 2: Inbound foreign students in Kazakhstan, 2018–2025, with the Chinese sub-cohort

The Concept itself acknowledges one operational gap directly: 'There is no systematised online information available about the higher education system of Kazakhstan for prospective foreign students' (Government of the Republic of Kazakhstan, 2023, Section 2, item 9; author's translation from Russian). The Study in Kazakhstan portal is the proposed remedy. The Concept does not, however, identify any operational gap in the linguistic, sociocultural, academic or institutional support architecture for incoming students once enrolled — a silence that motivates the next four sub-sections. Figure 3 situates the Concept inside the wider policy hierarchy.

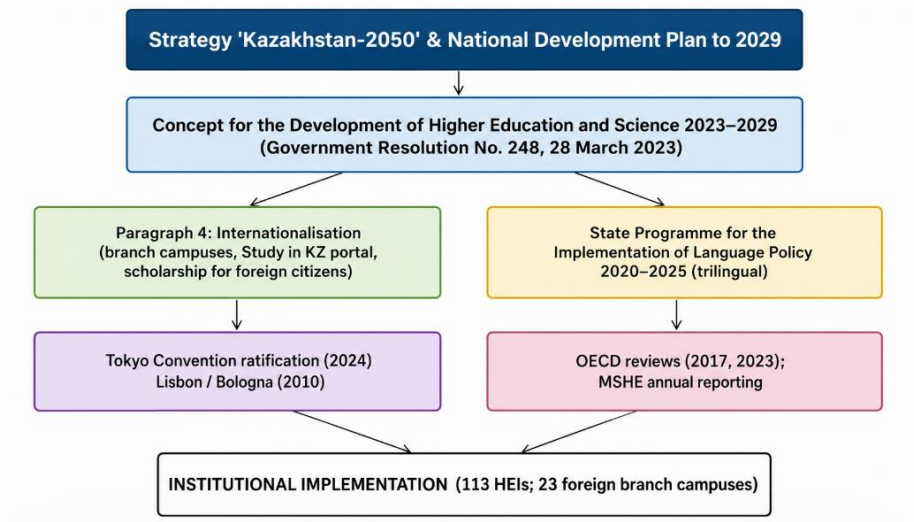


Figure 3: Policy framework hierarchy governing internationalisation in Kazakhstan

4.2 Linguistic Adaptation

Kazakhstan operates a constitutional trilingual policy in which Kazakh is the state language, Russian carries the status of language of inter-ethnic communication, and English is positioned as the language of global academic engagement. In higher education, Sarmurzin et al. (2023) and Karabassova (2020) describe a '50:20:30' allocation across the three languages, although Kucherbayeva and Smagulova (2023) document that implementation has been uneven and that Russian remains the dominant language of instruction in most institutions outside Nazarbayev University, KIMEP University and the dedicated English-medium streams. Goodman and Kambatyrova (2022) characterise English in Kazakh higher education as 'both necessary and irrelevant', producing what they term linguistic injustice. The country ranks 93rd of 100 on the EF English Proficiency Index, and Tajik et al. (2023) and Manan et al. (2024) document considerable emotion labour among STEM teachers attempting to deliver content in English.

For Chinese students, the linguistic burden is triple rather than double. First, Russian is the principal language of instruction in most disciplines and in most non-flagship institutions, and the acquisition of Cyrillic script and Russian morphology presents a documented difficulty for native speakers of Mandarin (Gao, Kassymova, Dzholdasbekova, Bayanbayeva, & Tattymbetova, 2023). Second, the Kazakh language is gaining ground in instructional contexts and is required for some administrative interactions, even where instruction itself is Russian-medium. Third, English is the official language of global academic mobility and the working language of branch-campus programmes. Cummins' (2008) BICS / CALP distinction is decisive here: a Chinese student may achieve sufficient Russian conversational fluency within twelve to eighteen months, but the academic-language proficiency required to read scholarly Russian texts, write coursework essays in APA or GOST citation style, follow lectures at native pace and produce assessable written work typically requires five to seven years. The Concept does not specify a pre-sessional Russian or Kazakh language programme for non-CIS international students, nor does it reference Cummins or any equivalent framework. The empirical literature on Chinese students in Russia (Galchenko & van de Vijver, 2007) reports that Russian-language proficiency is the strongest single predictor of sociocultural adaptation, supplying inferential warrant for treating this as a first-order policy gap in the Kazakhstan case.

4.3 Sociocultural Adaptation

The Berry (1997, 2005) framework yields a counter-intuitive prediction for the Kazakhstan-China case. On standard Hofstede dimensions, China and Kazakhstan are similar on collectivism (IDV scores of 20), long-term orientation (LTO 87 and 85 respectively) and power distance (PDI 80 and 88), implying smaller cultural distance than the China–United States or China–United Kingdom configurations that dominate the comparative literature. The integration strategy —

strong host-culture engagement combined with maintained heritage-culture identity — should therefore be more available to Chinese students in Kazakhstan than in Anglophone destinations. The qualifying condition is the qandas distinction: a substantial share of the 3,367 Chinese students in Kazakhstan are ethnic Kazakhs from the Xinjiang Uyghur Autonomous Region rather than Han Chinese (CAPS Unlock, 2025). Zharkynbekova et al. (2024) report that ethnic-Kazakh repatriates from China face greater Cyrillic-acquisition and ideological-adjustment difficulties than counterparts from Mongolia, but that family networks materially mediate adaptation outcomes — a structural advantage that Han-Chinese students do not enjoy.

Marginson et al.'s (2010) student-security framework adds a layer that the Concept does not. Sawir et al. (2012) show that students in non-Anglophone host environments — including Russophone universities — typically form dense co-national networks as a substitute for inadequate institutional pastoral provision. Anecdotal evidence from KazNU, where approximately 2,000 of the country's Chinese students cluster (Qazinform, 2025), suggests that this pattern obtains in Kazakhstan as well, but no peer-reviewed study has yet measured it. The Concept's Paragraph 4 references visa simplification, infrastructure and grants but does not address co-national clustering, intercultural mentoring, mental-health provision or anti-discrimination protocols. The OECD (2017) review of Kazakh higher education already identified the generally poor condition of university facilities and services as a constraint on international expansion; the Concept's response is largely silent on the pastoral dimension.

4.4 Academic and Classroom Integration

Chinese students are products of what Watkins and Biggs (1996) term the Confucian heritage learning culture, characterised by strong teacher authority, sustained reflective study, deferential classroom posture and a pedagogical premium on memorisation and cumulative mastery before critical engagement. Tian and Low (2011) and the systematic review by Springer (2020) caution against caricature: Chinese students are not inherently uncritical, and prior schooling experience is a stronger predictor of classroom behaviour than essentialised culture. Nevertheless, the transition into a Kazakh higher-education classroom is non-trivial. The Kazakh system is itself in transition between a Soviet pedagogical inheritance — characterised by the lecture-as-canonical-text and the reproduce-the-textbook examination — and a Bologna-aligned framework that valorises critical thinking, seminar discussion and independent research (Tampayeva & Tampayeva, 2023; Kuzhabekova & Lee, 2020). A Chinese student therefore enters not a stable Western pedagogical culture but a hybrid post-Soviet system whose own pedagogical norms are contested.

Academic integrity is a particular friction point. Kazakhstan has invested in anti-plagiarism software (Antiplagiat.Kazakhstan, deployed since 2021; Strike Plagiarism in widespread use), and Times Higher Education has reported that bribery, plagiarism and corruption blighted Kazakhstan's higher education reputation through the 2010s. Goodman and Kushkimbayeva (2024) document, however, that anti-plagiarism software is often deployed punitively rather than developmentally. Citation conventions vary across institutions: Kazakh university theses use either APA, GOST

(Soviet-legacy interstate standard) or Harvard, sometimes inconsistently within the same institution. A Chinese student trained in Chinese-language citation conventions must therefore acquire not one but multiple citation systems, often without explicit instruction, and is then assessed for compliance by software whose threshold settings vary by institution and by supervisor. The Concept addresses academic integrity in general terms (Paragraph 4 references 'academic integrity in accordance with the principles of the Bologna Process') but does not specify support provision for international students entering this multi-standard environment.

Table 1 summarises the four adaptation domains, the adverse Berry outcome each makes more likely if unaddressed, and the policy provision currently available in the Concept against the international good-practice benchmark.

Table 1. Adaptation domains, Berry strategies and Concept provision

Domain	Risk if unaddressed (Berry, 1997, 2005)	Concept 2023–2029 provision	International good-practice benchmark
Linguistic	Separation; CALP underdevelopment (Cummins, 2008)	Trilingual policy referenced; no pre-sessional Russian/Kazakh provision specified	Mandatory pre-sessional language year (Russia, China, Malaysia, UAE)
Sociocultural	Co-national clustering; psychological distress (Sawir et al., 2012)	Visa simplification, infrastructure, grants; no pastoral provisions	Intercultural mentor scheme; mental-health office; buddy programmes
Academic / classroom	Marginalisation; assessment failure	Bologna alignment, academic integrity in general terms; no targeted citation/integrity training	Academic-skills bridging course; consistent citation standard; developmental plagiarism feedback
Institutional	Disengagement; attrition (Marginson et al., 2010)	International office capacity expansion implicit in branch-campus growth; no pastoral KPI	Annual retention/satisfaction reporting disaggregated by source country

4.5 Institutional Support Gaps

Institutional provision for international students in Kazakhstan currently emphasises bureaucratic compliance over pastoral care. Visa procedures are well documented at most major institutions: KIMEP, KazNU, KazNARU, Narxoz, the Almaty IEC and APEMS publish detailed registration timelines (typically three calendar days), C9 student-visa procedures, annual visa-renewal requirements, and the standard prohibition on student employment. The administrative architecture is functional but minimal in scope. Mental health and counselling services targeted at international students are largely absent from publicly available institutional documentation. The five Confucius Institutes hosted in Kazakhstan (at Eurasian National University since 2007, KazNU since 2009, K. Zhubanov Aktobe Regional University, Karaganda State Technical University and Ablai Khan University) are oriented toward outbound Chinese-language instruction for Kazakh students rather than toward inbound support for Chinese students. The scholarship architecture has expanded — the Ministry of Science and Higher Education awarded 240 grants for foreign citizens in 2021 and 550 for the 2025–2026 academic year (Bolashak.gov.kz, 2025) — but remains modest relative to the indicator #7 trajectory. Table 2 summarises the institutional support gap against three comparator country systems.

Table 2. Comparative institutional support for international students

Provision	**Kazakhstan**	**Russia**	**Malaysia**	**China**
Pre-sessional language year	Not in Concept	Mandatory podfak	Mandatory English bridging	Mandatory yuxiao (preparatory)
Dedicated international student office	Visa-focused	Visa + pastoral	Pastoral + career	Visa + pastoral
Mental-health support	Patchy	Limited	Standard	Limited
Intercultural mentor / buddy	Largely absent	Variable	Standard	Variable
Government scholarship volume (annual, foreign)	550 (2025–26)	≈30,000	≈3,000	≈40,000 BRI
Source-country disaggregated reporting	Aggregate only	Yes (Rosstat)	Yes	Yes (MoE)

5. DISCUSSION

The integrated framework of Section 2 supports three structural arguments about the Concept and the Chinese-student case.

First, the Concept is rationale-rich but infrastructure-poor. In Knight's (2004) terms, indicator #7, the branch-campus expansion target, the scholarship programme and the Tokyo Convention ratification are most coherent under economic and political rationales: foreign students generate revenue, branch campuses signal modernisation, and the Tokyo Convention positions Kazakhstan inside a Pacific recognition framework that aligns with the country's broader pivot toward Asian source markets. The academic and cultural-social rationales — curriculum internationalisation, faculty international competence, intercultural learning for domestic students, mutual understanding — receive thinner operational treatment. The result is the syndrome de Wit (2024) describes as 'everything that quacks is internationalisation': diverse activities are bundled under a single banner without a coherent operational theory of how the inbound student experience should be supported once recruited. The Concept's own acknowledgement that no systematised information is available for prospective foreign students captures this asymmetry in a single line.

Second, the Chinese-student case exposes a double-language, double-culture adaptation challenge that the existing internationalisation framework — itself built around Anglophone-Western host contexts — does not yet capture. Cummins' (2008) CALP development timeline is calibrated for a single host language; for the Kazakh case it must be doubled or tripled. Marginson et al.'s (2010) student-security architecture must be re-localised for a host system whose own academic identity is contested between Soviet inheritance, Bologna alignment and Englishisation. Berry's (2005) integration strategy is, in principle, more available to Chinese students in Kazakhstan than in the West because cultural distance on Hofstede dimensions is smaller, but realising that potential requires deliberate institutional scaffolding that the Concept does not specify. The Zharkynbekova et al. (2024) finding that family networks mediate qandas adaptation has no obvious analogue for Han-Chinese students, who arrive without those networks.

Third, Altbach's (1981, 2016) centre–periphery logic re-emerges in reverse for the Kazakhstan-China relationship. Rather than Kazakhstan being peripheral to the West and using English to access the centre, the Chinese-student case opens the possibility that Kazakhstan becomes peripheral to Chinese Belt and Road educational soft power: cheaper than the West, geographically convenient, useful for Chinese soft-power signalling and Russian-language certification, but unable to compete with China itself for prestige, scholarship volume or pedagogical innovation. The asymmetric flow — 20,000 Kazakhstani students in China against 3,367 Chinese in Kazakhstan — already reflects this asymmetry. If indicator #7 is to be met genuinely rather than nominally, the Concept's next iteration would benefit from a deliberate articulation of what Kazakh higher education offers Chinese students that they could not obtain elsewhere, and then resourcing the linguistic, sociocultural, academic and institutional infrastructure that delivers on that distinctive offer.

Comparative lessons reinforce the argument. Russia's mandatory podgotovitel'nyi fakul'tet (preparatory faculty) provides a one-year language and academic-bridging year that has historically

anchored Chinese-student adaptation in Russophone settings (Galchenko & van de Vijver, 2007). Malaysia's English-medium hub model, the United Arab Emirates' premium branch-campus model and China's own yuxiao preparatory year all bundle language and academic bridging with pastoral provision in ways that Kazakhstan's current arrangement does not. China's BRI scholarship volume — approximately 40,000 students globally in 2018, of whom Kazakhstanis are in the top ten recipients (Shih & Cao, 2022) — Kazakhstan cannot match dollar-for-dollar; what it can match is curricular quality and pastoral coherence.

Several methodological caveats apply. The numerical inconsistency between the Concept text (10 per cent of total enrolment by 2029) and ministerial communications (100,000 to 150,000 students by 2029) is unreconciled in public sources and may reflect aspirational restatement rather than formal target revision. The cohort labelled 'Chinese students' in Kazakh statistics conflates Han Chinese, qandas and other ethnic minorities; this paper has flagged the distinction throughout but cannot disaggregate it quantitatively from public sources. The peer-reviewed empirical base on Han-Chinese student adaptation in Kazakhstan is, at the time of writing, effectively absent; the inference scaffolding from Russia, Malaysia and the United States is suggestive rather than confirmatory. These caveats motivate the research agenda set out in Section 6.

6. CONCLUSION

This paper has argued, on conceptual and policy grounds, that the Concept for the Development of Higher Education and Science of the Republic of Kazakhstan for 2023–2029 sets a numerically ambitious internationalisation target — indicator #7's progression from 7.1 per cent foreign-student share in 2023 to 10 per cent by 2029, restated by ministerial communications as up to 150,000 inbound students — without commensurate operational provision for the linguistic, sociocultural, academic and institutional adaptation challenges that Chinese students in particular face inside the Kazakh system. The integrated framework drawn from Knight (2004), Berry (1997, 2005), Cummins (2008), Marginson et al. (2010) and Altbach (1981, 2016) shows that the Concept is rationale-rich but infrastructure-poor, that the Chinese-student case exposes a double-language, double-culture adaptation challenge inadequately captured by the existing Anglophone-centred literature, and that the Kazakhstan-China relationship risks reproducing centre–periphery asymmetries in reverse if institutional capacity does not match recruitment ambition.

Five policy recommendations follow. First, the next iteration of the Concept, or its successor instrument, should specify a mandatory pre-sessional Russian-and-Kazakh academic-language programme for non-CIS international students, drawing on the Russian podfak and the Chinese yuxiao precedents and calibrated against Cummins' (2008) CALP development timeline. Second, faculty development for English-medium and intercultural classroom teaching should scale proportionally with the branch-campus expansion, with funded provision through the Centre for International Programmes. Third, every higher education institution receiving foreign students

should designate intercultural-mentor and mental-health roles inside its international office, supplementing the existing visa-and-registration function. Fourth, a bilateral Kazakh-Chinese instrument going beyond memorandum-of-understanding status should align degree recognition, citation conventions and pastoral standards. Fifth, the Ministry of Science and Higher Education should institute an annual reporting indicator that disaggregates retention, completion and satisfaction outcomes by source country, including specifically by Chinese sub-cohort, with separate reporting for Han-Chinese and qandas students where institutional records permit.

The most consequential research gap is the absence of any peer-reviewed Q1 or Q2 empirical study on Han-Chinese student adaptation in Kazakhstan. A preregistered, mixed-methods study of two to three Kazakh institutions hosting substantial Chinese cohorts — KazNU, Eurasian National University and a major branch-campus host — measuring linguistic, sociocultural, academic and institutional-support outcomes against the integrated framework of this paper would simultaneously address that gap, supply Kazakh policy-makers with the disaggregated evidence the Ministry of Science and Higher Education currently lacks, and locate Kazakhstan's Chinese-student case inside the global comparative literature on international student adaptation. This is the direction of the author's next study.

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Artificial Intelligence in Public Communication in Kazakhstan: A Narrative Review from a Listening State Perspective

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ABSTRACT

Artificial intelligence (AI) is increasingly integrated into public-sector communication to improve administrative efficiency, automate citizen interactions, and support digital governance. However, the assumption that AI-driven systems inherently enhance government responsiveness remains conceptually underexplored. This study critically examines the role of AI in public communication in Kazakhstan through the normative framework of the Listening State (Halyq Үниһе Qulaq Asatyn Memleket). Using a theory-driven narrative review, the study synthesizes peer-reviewed literature, international reports, and official policy documents to evaluate whether AI-supported communication strengthens institutional listening or primarily expands monitoring and procedural responsiveness.

The analysis is guided by four analytical concepts: AI as communicative infrastructure, the distinction between monitoring and listening, procedural versus institutional responsiveness, and algorithmic opacity. The findings indicate that Kazakhstan's current approach to AI in public communication is largely oriented toward administrative efficiency and automated monitoring rather than interpretive institutional listening. While digital systems such as e-Otinish improve the speed and visibility of government responses, they remain only weakly connected to organizational learning, transparent decision-making, and meaningful citizen influence on policy development.

The study argues that successful digital transformation should not be assessed solely through technological adoption or service efficiency. Instead, AI-enabled public communication should be evaluated according to its capacity to enhance institutional responsiveness, communicative accountability, transparency, and public legitimacy. By integrating scholarship on organizational listening, digital governance, and AI in public administration, this paper proposes a conceptual framework for assessing AI-supported public communication in Kazakhstan and offers broader implications for digitally transforming governments pursuing human-centered governance reforms.

KEYWORDS: Artificial intelligence; public communication; Listening State; Kazakhstan; Organizational listening; digital governance; government responsiveness; algorithmic opacity.

1. INTRODUCTION

Artificial intelligence has become an integral component of contemporary public-sector communication, transforming how governments interact with citizens through automated service delivery, digital complaint systems, chatbots, and data-driven decision-making. Across the world, AI is increasingly promoted as a means of improving administrative efficiency, accelerating service provision, and strengthening government responsiveness. As public institutions continue to digitalize, communication is no longer limited to the dissemination of information but increasingly depends on algorithmic systems that collect, classify, and respond to citizens' requests.

Despite these developments, the relationship between AI and public communication remains conceptually underexplored. Existing studies predominantly evaluate AI through the lenses of technological innovation, administrative efficiency, or digital governance, while comparatively little attention has been devoted to its implications for institutional listening, communicative accountability, and democratic legitimacy. Faster responses or automated interactions do not necessarily indicate that governments genuinely understand, interpret, or incorporate citizens' concerns into decision-making processes. This creates what this study conceptualizes as the responsiveness paradox: AI-enabled systems may substantially improve procedural responsiveness while leaving institutional responsiveness largely unchanged.

The distinction between monitoring and listening provides the theoretical foundation for addressing this paradox. Monitoring refers to the technical collection and processing of public information, whereas listening requires interpretation, organizational reflection, and meaningful institutional response. Although AI significantly expands governments' monitoring capabilities, these technologies do not automatically strengthen their capacity to listen. Furthermore, algorithmic opacity raises additional concerns regarding transparency, accountability, and citizens' ability to understand how governmental decisions are generated.

Kazakhstan provides a particularly valuable context for examining these issues. Since the introduction of the Listening State (Halyq Ünine Qulaq Asatyn Memleket) doctrine in 2019, the country has simultaneously pursued ambitious digital government reforms and accelerated the integration of AI into public administration. Recent initiatives, including the national AI Development Concept and the expansion of the e-Otinish platform, illustrate the state's commitment to improving responsiveness through digital technologies. However, it remains unclear whether these reforms primarily strengthen institutional listening or simply increase the efficiency of administrative monitoring.

This paper addresses this gap through a theory-driven narrative review of scholarly literature, international reports, and official policy documents. Drawing upon the concepts of organizational listening, the Listening State, procedural and institutional responsiveness, and algorithmic opacity, the study develops an integrated conceptual framework for evaluating AI-enabled public communication in Kazakhstan. The findings contribute to current debates on AI in public

administration by arguing that successful digital transformation should be assessed not only through technological adoption and administrative efficiency but also through its capacity to strengthen institutional responsiveness, communicative accountability, and public legitimacy.

This paper makes three contributions to the literature. First, it integrates research on artificial intelligence, organizational listening, and public communication into a unified analytical framework for evaluating AI-enabled communication in the public sector. Second, it conceptualizes the responsiveness paradox by distinguishing procedural responsiveness from institutional responsiveness in AI-mediated governance. Third, it applies these conceptual distinctions to Kazakhstan's Listening State, demonstrating how digital modernization may strengthen monitoring without necessarily improving institutional listening and democratic legitimacy.

2. LITERATURE REVIEW

The rapid adoption of artificial intelligence has significantly transformed public-sector communication by enabling governments to automate administrative processes, analyze large volumes of citizen-generated data, and deliver public services more efficiently. Existing scholarship generally presents AI as a technological innovation that improves organizational performance through automation, predictive analytics, sentiment analysis, and digital service delivery (Wirtz et al., 2019; Valle-Cruz et al., 2020). Within this perspective, AI is primarily evaluated according to its ability to increase efficiency, reduce administrative costs, and enhance service responsiveness. However, this instrumental understanding provides only a partial explanation of AI's role in contemporary public communication.

Recent communication scholarship argues that AI should also be understood as a communicative infrastructure rather than merely a technical tool. Algorithmic systems influence which public concerns become visible, how citizen input is categorized, and which issues receive institutional attention. Consequently, AI actively shapes communication processes instead of simply supporting them. This perspective shifts analytical attention from technological performance toward broader questions of legitimacy, accountability, and democratic governance.

A central theoretical foundation of this study is the concept of organizational listening, developed primarily by Macnamara (2016, 2019, 2024). Organizational listening emphasizes that meaningful communication extends beyond collecting public feedback or monitoring digital interactions. Instead, listening requires institutional capacities for interpretation, reflection, and consequential response. Public participation becomes meaningful only when citizens' voices influence organizational learning and decision-making. From this perspective, monitoring and listening represent fundamentally different institutional processes. Monitoring focuses on collecting and processing information, whereas listening requires governments to interpret public concerns and visibly incorporate them into institutional action.

The distinction between monitoring and listening becomes particularly significant in AI-mediated governance. Digital technologies substantially improve governments' ability to process large volumes of citizen input, yet they do not automatically enhance institutional responsiveness. Several scholars therefore caution against equating technological efficiency with democratic responsiveness. AI systems may increase procedural responsiveness by accelerating complaint processing, automating replies, and expanding monitoring capacities while simultaneously failing to strengthen interpretive engagement, organizational learning, or meaningful public influence on policymaking.

Another important concern addressed in the literature is algorithmic opacity. AI systems frequently operate through complex decision-making processes that remain difficult for citizens and even public officials to fully understand. Limited transparency regarding how algorithms classify, prioritize, or evaluate citizen requests raises significant concerns regarding accountability, fairness, and institutional legitimacy. When citizens cannot understand how administrative decisions are produced, public communication risks becoming procedurally efficient but substantively opaque.

Kazakhstan represents a particularly relevant setting for examining these issues because digital transformation has become one of the central priorities of public administration. Since the introduction of the Listening State doctrine in 2019, government reforms have increasingly emphasized responsiveness, dialogue, and citizen-oriented governance. Simultaneously, the country has rapidly expanded AI-enabled digital services, including the e-Otinish platform and the national AI Development Concept. While these reforms have significantly improved administrative efficiency, existing scholarship provides limited evidence that they have strengthened institutional listening or communicative accountability. This gap highlights the need for a more comprehensive conceptual framework capable of evaluating AI-enabled public communication beyond conventional measures of efficiency and service delivery.

3. METHODOLOGY

This study employs a qualitative, theory-driven narrative review to critically examine the role of artificial intelligence in public communication within the framework of Kazakhstan's Listening State. A narrative review was selected because the research addresses a conceptual rather than an empirical problem, aiming to integrate fragmented scholarship from public communication, digital governance, organizational listening, and artificial intelligence into a coherent analytical framework. Unlike systematic reviews that primarily aggregate empirical evidence, a narrative review enables theoretical synthesis and conceptual interpretation across interdisciplinary sources.

The literature search was conducted using major academic databases, including Scopus, Web of Science, and Google Scholar, supplemented by citation tracking to identify additional relevant publications. Because AI governance and digital transformation evolve rapidly, the review also incorporated carefully selected grey literature, including reports and policy documents published by the OECD, United Nations, UNDP, and the Government of Kazakhstan. The quality and

credibility of grey literature sources were assessed using the AACODS framework to ensure analytical reliability.

Source selection followed predefined inclusion and exclusion criteria. Publications were included when they addressed one or more of the following themes: artificial intelligence in public administration, public communication, organizational listening, digital governance, algorithmic accountability, or Kazakhstan's digital transformation. Sources unrelated to government communication or lacking conceptual relevance to the research objectives were excluded. Following source selection, the literature was analyzed through thematic coding, allowing recurring concepts, theoretical relationships, and analytical patterns to emerge across the dataset.

The synthesis was guided by the Popay narrative synthesis framework, which emphasizes systematic organization, thematic interpretation, and conceptual integration rather than statistical aggregation. Four analytical concepts structured the interpretation of the literature: AI as communicative infrastructure, the distinction between monitoring and listening, procedural versus institutional responsiveness, and algorithmic opacity. These concepts served as the theoretical lens through which the selected literature and policy documents were evaluated.

To enhance the trustworthiness of the study, the review maintained methodological transparency through explicit documentation of the search strategy, source selection, analytical procedures, and theoretical assumptions. As a conceptual study based exclusively on published materials, no human participants were involved, and therefore formal ethical approval was not required. Nevertheless, the study followed established principles of academic integrity, transparency, and accurate representation of the literature throughout the research process.

4. FINDINGS

The narrative synthesis demonstrates that artificial intelligence is currently conceptualized in Kazakhstan primarily as an instrument of administrative modernization rather than as a mechanism for strengthening institutional listening. Across academic literature, international policy documents, and national strategic initiatives, AI is consistently associated with improved efficiency, automation of administrative procedures, and accelerated public service delivery. While these developments enhance governments' technical capacity to process citizen requests, they provide comparatively limited evidence that AI contributes to deeper communicative engagement or institutional learning.

A recurring finding concerns the distinction between monitoring and listening. The reviewed literature indicates that contemporary AI systems substantially expand governments' ability to monitor citizen interactions through automated complaint management, sentiment analysis, predictive analytics, and digital feedback platforms. However, these technologies primarily facilitate information collection and categorization rather than interpretive engagement with citizens' concerns. As a result, increased technological sophistication should not be interpreted as evidence of stronger institutional listening.

The findings further reveal the existence of a responsiveness paradox. Digital platforms, particularly Kazakhstan's e-Otinish system, have significantly improved procedural responsiveness by reducing response times, increasing transparency of complaint processing, and expanding access to public services. Nevertheless, improvements in procedural performance are only weakly connected to institutional responsiveness, understood as the ability of public institutions to interpret citizen feedback, learn from recurring concerns, and incorporate public input into policy adaptation. Consequently, AI strengthens administrative responsiveness without necessarily strengthening democratic responsiveness.

Another important finding concerns algorithmic opacity. The reviewed evidence suggests that the increasing reliance on AI introduces new challenges for communicative accountability. Citizens frequently lack sufficient information regarding how algorithmic systems classify requests, determine priorities, or generate administrative responses. This limited transparency reduces the explainability of public decision-making and may weaken institutional legitimacy even where procedural efficiency improves.

Finally, the review indicates that AI can support the objectives of the Listening State only under specific institutional conditions. Technological innovation alone is insufficient to create meaningful public participation. AI contributes to organizational listening only when automated systems are accompanied by transparent governance, human oversight, institutional learning mechanisms, and visible integration of citizen perspectives into policy development. Without these conditions, AI risks reinforcing a technocratic model of governance in which responsiveness is measured primarily through speed and administrative performance rather than through meaningful dialogue and public influence.

5. DISCUSSION

The findings suggest that the current trajectory of AI adoption in Kazakhstan reflects a broader global tendency to equate technological efficiency with institutional responsiveness. Although AI-enabled communication systems substantially improve the speed, consistency, and scalability of administrative interactions, they do not automatically strengthen governments' capacity for meaningful public listening. This distinction represents the central theoretical contribution of the study and challenges the widespread assumption that digital transformation necessarily produces more responsive governance.

The concept of the responsiveness paradox provides an explanation for this contradiction. AI expands governments' procedural capacity by automating communication, organizing citizen requests, and accelerating administrative workflows. However, these improvements remain primarily operational unless they are accompanied by institutional mechanisms capable of interpreting citizen concerns, supporting organizational learning, and incorporating public input into policy development. Consequently, procedural responsiveness should not be interpreted as evidence of institutional responsiveness.

The study also extends the literature on organizational listening by applying it to AI-mediated public communication within the specific context of Kazakhstan's Listening State. Previous research has emphasized listening as an organizational capability requiring interpretation, reflection, and consequential response. This study demonstrates that these requirements become even more important as governments increasingly rely on algorithmic systems to mediate communication with citizens. AI may significantly strengthen monitoring capacities while leaving listening capacities underdeveloped, thereby reinforcing a communicative imbalance between technological capability and democratic engagement.

A further contribution concerns algorithmic opacity. As AI systems assume greater responsibility for classifying, prioritizing, and responding to public requests, transparency becomes an essential condition of communicative legitimacy. Citizens are unlikely to perceive public institutions as genuinely responsive if they cannot understand how algorithmic decisions are produced or how their concerns influence administrative outcomes. Therefore, transparency should be understood not merely as a technical requirement but as a communicative principle that sustains public trust and institutional accountability.

The Kazakhstan case demonstrates that digital modernization should be evaluated not only by technological adoption but also by its capacity to strengthen institutional listening. The Listening State provides an important normative benchmark because it emphasizes responsiveness as an ongoing relationship between government and citizens rather than as a collection of administrative performance indicators. In this context, AI should be viewed as a supportive instrument that complements, rather than replaces, human judgment, deliberation, and institutional reflection.

Taken together, the findings suggest that the future development of AI-enabled public communication depends less on technological sophistication than on the institutional conditions within which these technologies operate. Human oversight, interpretive transparency, organizational learning, and meaningful citizen participation remain essential prerequisites for ensuring that AI contributes to democratic governance rather than merely increasing administrative efficiency.

6. CONCLUSION

This study examined the role of artificial intelligence in public communication in Kazakhstan through the normative framework of the Listening State. By synthesizing interdisciplinary scholarship and policy documents, it demonstrated that the current implementation of AI primarily strengthens administrative monitoring and procedural responsiveness rather than institutional listening. Although AI-enabled systems improve the efficiency of government communication and service delivery, technological advancement alone does not guarantee meaningful citizen engagement, communicative accountability, or democratic legitimacy.

The study contributes to the growing literature on AI in public administration by integrating concepts from organizational listening, digital governance, and public communication into a

unified analytical framework. In particular, it highlights the importance of distinguishing between monitoring and listening, as well as between procedural and institutional responsiveness, when evaluating AI-supported communication systems. These conceptual distinctions provide a more comprehensive basis for assessing whether digital transformation genuinely strengthens relationships between governments and citizens.

From a practical perspective, the findings suggest that Kazakhstan's continued digital modernization should prioritize institutional capacities alongside technological innovation. AI should support transparent decision-making, organizational learning, and meaningful citizen participation rather than functioning solely as a tool for accelerating administrative processes. The Listening State can therefore serve not only as a political objective but also as an evaluative framework for designing more human-centered systems of AI-enabled public communication.

While this study is conceptual in nature, it establishes a foundation for future empirical research. Further studies may investigate how AI-supported communication platforms, including e-Otinish, operate in practice, examine citizens' perceptions of AI-mediated government communication, and compare Kazakhstan's experience with other digitally transforming states. Such research would contribute to a deeper understanding of how artificial intelligence can enhance not only administrative efficiency but also institutional responsiveness, public trust, and democratic governance.

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How Digital Intelligence Enables Corporate Green Development. A Conceptual Framework of Environmental Responsibility, Green Innovation, and Financing Mechanisms

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ABSTRACT

This paper reconceptualizes the relationship between digital intelligence and corporate green development as a strategic, multi-stage organizational process rather than a simple technology adoption outcome. Instead of presenting the manuscript as a literature review, the paper develops a conceptual framework that explains how digital intelligence can reshape environmental responsibility, stimulate green innovation, and improve access to green finance. The argument proceeds in three steps. First, digital intelligence strengthens data visibility, traceability, and monitoring capacity, which can shift firms from symbolic environmental disclosure toward more substantive environmental responsibility. Second, digital intelligence expands search, learning, and recombination capacity across organizational and interorganizational boundaries, thereby improving the conditions for green innovation. Third, digitally enabled information credibility can reduce information asymmetry between firms and external capital providers, making green investments more legible and potentially easing financing constraints. The paper then identifies boundary conditions, including regulatory intensity, digital infrastructure maturity, organizational absorptive capacity, and ownership structure, as well as major risks such as cyber vulnerability, metric manipulation, and uneven capability distribution across firms. The contribution of the paper is threefold. It clarifies the conceptual boundaries among digital intelligence, corporate environmental responsibility, green innovation, and green development. It integrates these constructs into a recursive mechanism-based architecture. It also offers a focused agenda for future

empirical research on measurement, causal identification, and contextual heterogeneity.

KEYWORDS: Digital intelligence, Corporate environmental responsibility, Green innovation, Green development, Financing mechanisms, Information asymmetry

1. INTRODUCTION

Digital transformation is increasingly discussed as a driver of sustainability. Yet the existing conversation remains theoretically fragmented. One stream emphasizes productivity gains, data-driven efficiency, and organizational automation. Another emphasizes environmental upgrading, green innovation, and low-carbon transition. These two streams often intersect empirically, but the mechanisms connecting them remain underspecified (Danish et al., 2023; Dauvergne, 2022; Wang et al., 2024).

This paper addresses that gap by advancing a conceptual framework rather than claiming to offer a systematic review. The original manuscript contained the seeds of an important idea, namely that digital intelligence matters for green development not because technology is intrinsically sustainable, but because it can restructure information, incentives, learning, and financing conditions inside the firm. Reframing the paper in conceptual rather than review terms allows the argument to become more precise and more consistent with the way related scholarship has developed across the digitalization, green innovation, and green finance literatures (Garad et al., 2024; Feng et al., 2024).

The paper makes three contributions. First, it clarifies the conceptual boundaries among four constructs that are often conflated in emerging work. Digital intelligence refers here to the organizational deployment of advanced data analytics, algorithmic systems, interoperable digital platforms, and traceable information architectures. Corporate environmental responsibility refers to the degree to which firms internalize environmental obligations in strategic decision making rather than treating them as symbolic compliance. Green innovation captures new or improved products, processes, or organizational solutions that reduce environmental harm. Green development is treated as the broader firm-level outcome, where ecological upgrading becomes embedded in competitive and financial performance (Danish et al., 2023; Yang et al., 2021).

Second, the paper integrates these constructs into three linked mechanisms. Digital intelligence can increase transparency and traceability, thereby strengthening substantive environmental responsibility. It can improve cross-domain search and knowledge recombination, thereby supporting green innovation. It can also increase information credibility, thereby easing financing frictions around long-horizon green investment. Third, the paper outlines the boundary conditions and strategic tensions that shape when these mechanisms are likely to operate, and where they may fail or generate unintended risks (Dauvergne, 2022; Feng et al., 2024; Xu et al., 2023).

2. CONCEPTUAL POSITIONING AND CONSTRUCT BOUNDARIES

A central weakness in the emerging literature is conceptual overlap. Digitalization, artificial intelligence, digital transformation, fintech, blockchain, and data analytics are often treated as interchangeable labels, even though they refer to different layers of technological and organizational change. This matters because causal explanation becomes unstable when the focal construct is not clearly delimited. A firm that adopts a reporting dashboard is not equivalent to a firm that reorganizes decision processes around predictive analytics and cross-functional data integration. The present paper therefore uses digital intelligence in a narrower and more strategic sense. It denotes not mere technological adoption, but the deployment of data-intensive systems that alter how the firm senses problems, interprets signals, and allocates resources (Danish et al., 2023; Garad et al., 2024).

A similar problem arises on the environmental side. Corporate environmental responsibility is not identical to green performance, green innovation, or ESG disclosure. Responsibility concerns the firm's strategic willingness to internalize environmental obligations. Green innovation concerns the generation and implementation of environmentally beneficial novelty. Green development refers to the broader organizational outcome in which sustainability objectives become integrated with long-run capability upgrading and economic value creation. Distinguishing these constructs is essential because one can observe symbolic environmental disclosure without substantive innovation, or innovation without broader strategic responsibility (Chen & Yang, 2024; Jiakui et al., 2023).

The framework proposed here therefore assumes a layered causal structure. The proposed framework is organized around three interrelated pathways. As summarized in Table 1, digital intelligence capability strengthens corporate green development by improving environmental transparency, enabling knowledge recombination for green innovation, and reducing financing frictions through more credible reporting.Digital intelligence is treated as an enabling organizational capability. Corporate environmental responsibility and green innovation are treated as intermediate mechanisms. Green development is treated as the broader organizational outcome. Financing mechanisms cut across these relationships because many environmentally oriented investments are both uncertain and capital intensive. This layered structure makes it possible to analyze not only whether digital intelligence matters, but how it matters, through which channels, and under what conditions (Mealy & Teytelboym, 2022; Yang et al., 2021).

Table 1. Core architecture of the conceptual framework

Digital intelligence capability	Primary organizational mechanism	Intermediate strategic effect	Broader green development implication

Data visibility and traceability	Environmental transparency and monitoring	Substantive environmental responsibility	Lower room for symbolic compliance and greenwashing
Algorithmic search and integration	Knowledge recombination and absorptive learning	Green innovation capacity	Stronger capability for cleaner products, processes, and business models
Digitally credible reporting and accounting	Reduced information asymmetry with financiers	Improved access to green capital	Greater capacity to sustain green investment and long-term transition

3. A MECHANISM-BASED CONCEPTUAL FRAMEWORK

The core argument of the paper is that digital intelligence does not generate green development automatically. Its effects depend on how digital capabilities reshape organizational visibility, learning processes, and resource mobilization. The framework therefore proposes three analytically distinct but mutually reinforcing mechanisms. Each mechanism focuses on a different organizational bottleneck that often prevents firms from translating technological investment into substantive environmental upgrading (Dauvergne, 2022; Feng et al., 2024; Xu et al., 2023).

3.1 Digital intelligence, transparency, and substantive environmental responsibility

The first mechanism links digital intelligence to substantive environmental responsibility through transparency and traceability. Advanced analytics, sensor systems, and platform integration can make environmental conduct more observable across production processes and supply networks. When information becomes easier to monitor, compare, and audit, the room for symbolic compliance narrows. Digital systems can therefore increase the cost of decoupling public environmental claims from actual operational practice (Dauvergne, 2022; Wang et al., 2024).

The strategic implication is not that transparency automatically produces responsibility. Rather, higher visibility changes the cost-benefit structure of managerial action. When environmental claims become easier to verify, opportunistic greenwashing becomes more difficult to sustain. Firms then face stronger incentives to convert nominal compliance into more substantive environmental routines, investments, and accountability structures. In this sense, digital intelligence can shift environmental responsibility from a reputational facade toward a more credible organizational commitment (Dauvergne, 2022).

Proposition 1. Digital intelligence is more likely to strengthen substantive corporate environmental responsibility when it increases the visibility, comparability, and traceability of environmental information across organizational boundaries.

3.2 Digital intelligence, absorptive capacity, and green innovation

The second mechanism connects digital intelligence to green innovation through search, learning, and knowledge recombination. Green innovation rarely emerges from isolated technical effort alone. It often depends on the firm's ability to access heterogeneous knowledge, identify relevant signals across domains, and combine technical and market information into viable innovation pathways. Digital intelligence can reduce search costs, expand the scope of accessible information, and accelerate iterative experimentation, thereby increasing the likelihood that firms generate novel environmentally oriented solutions (Feng et al., 2024; Wang et al., 2025).

However, digital tools do not substitute for organizational capability. Their strategic value depends on whether firms possess sufficient absorptive capacity to interpret and recombine incoming information. Without such capacity, more data may simply produce noise, fragmentation, or superficial experimentation. The effect of digital intelligence on green innovation should therefore be stronger where firms already possess learning routines, cross-functional coordination, and a managerial orientation toward long-term capability development (Feng et al., 2024).

Proposition 2. The effect of digital intelligence on green innovation is strengthened when firms possess high absorptive capacity and organizational routines that support cross-domain knowledge integration.

3.3 Digital intelligence, information credibility, and financing mechanisms

The third mechanism links digital intelligence to green development through financing conditions. Many green projects face a double constraint. They are capital intensive, and their returns are often uncertain, delayed, or difficult for external financiers to evaluate. Information asymmetry therefore becomes a major barrier to the funding of environmental upgrading, especially when lenders doubt the credibility of corporate sustainability claims or the operational viability of green projects (Chien et al., 2021; Xu et al., 2023).

Digitally enabled reporting architectures, traceable accounting systems, and data-rich performance indicators can reduce uncertainty for investors and lenders. When firms can provide more credible evidence of operational discipline, environmental progress, and project monitoring capacity, financing frictions may decline. Digital intelligence thus has the potential to support green development not only by improving internal decision quality, but also by strengthening the information environment through which external capital is allocated (Razzaq & Yang, 2023; Yang et al., 2021).

Proposition 3. Digital intelligence is more likely to ease green financing constraints when it improves the credibility, standardization, and auditability of environmental and operational information.

3.4 Recursive relationships among responsibility, innovation, and finance

Taken together, these three mechanisms suggest a recursive architecture rather than a linear chain. More substantive environmental responsibility may increase the strategic demand for green innovation. More effective green innovation may improve the quality of environmental performance and thus strengthen financing credibility. Better financing conditions may in turn support deeper digital and environmental capability building. The relationship among responsibility, innovation, and finance is therefore cumulative and path dependent rather than sequential in a simple one-way sense (Jiakui et al., 2023; Yang et al., 2021).

4. BOUNDARY CONDITIONS, RISKS, AND STRATEGIC TENSIONS

The framework also identifies several boundary conditions. Regulatory intensity is likely to matter because the value of digital traceability increases when external scrutiny is credible. Where regulation is weak, transparency tools may still improve internal visibility, but they may not generate strong enough incentives to change behavior. Industry conditions also matter. In sectors with complex supply chains and measurable environmental footprints, the visibility effects of digital intelligence may be stronger than in sectors where environmental externalities are diffuse or difficult to attribute (Dauvergne, 2022; Wang et al., 2024).

Organizational heterogeneity is equally important. Absorptive capacity, leadership attention, and resource slack shape whether firms can translate digital intelligence into green innovation rather than narrow efficiency gains. Ownership structure and financing access also influence outcomes. Firms with stronger external legitimacy, more developed stakeholder ties, or better credit access may be better positioned to convert digital information into sustained environmental investment than firms facing acute financial constraints (Chien et al., 2021; Feng et al., 2024).

Importantly, the framework does not assume that digital intelligence is unambiguously beneficial. At least three risks deserve explicit attention. First, cyber vulnerability can undermine both operational integrity and stakeholder trust. Second, data-rich systems may create new forms of symbolic compliance if firms optimize metrics rather than underlying environmental performance. Third, digital infrastructure itself consumes material and energy resources, creating the possibility that some forms of intelligence-driven upgrading shift environmental costs rather than reduce them. These tensions are consistent with broader critiques of the political economy and governance risks embedded in digital sustainability transitions (Dauvergne, 2022; Garad et al., 2024).

5. RESEARCH AGENDA AND METHODOLOGICAL IMPLICATIONS

A stronger conceptual framework should lead to a sharper empirical agenda. The next stage of research should move beyond broad correlations between digitalization and environmental outcomes and focus on mechanism-sensitive inquiry. That requires better construct separation,

stronger designs for causal identification, and more explicit attention to organizational and institutional heterogeneity (Garad et al., 2024).

First, researchers need better construct measurement. Many studies still proxy digital transformation with coarse keyword counts or aggregate indices that say little about actual intelligence capability inside the firm. Future work should distinguish between reporting digitalization, process automation, predictive analytics, and cross-functional data integration. Similar precision is needed on the environmental side, where environmental responsibility, green innovation, and green performance should not be treated as interchangeable empirical indicators (Garad et al., 2024; Jiakui et al., 2023).

Second, stronger causal identification is needed. The most important question is not whether digitally advanced firms perform better on average, but under what conditions digital intelligence changes environmental responsibility, innovation output, and financing access. This implies greater use of longitudinal designs, quasi-natural experiments, event-based identification strategies, and multi-level analysis capable of isolating organizational mechanisms rather than simply reporting associations (Feng et al., 2024; Wang et al., 2025).

Third, research should take context seriously. The mechanisms proposed here may operate differently across industries, ownership forms, and institutional environments. Heavy manufacturing, platform firms, export-oriented producers, and resource-intensive firms are unlikely to face identical environmental and financial pressures. Comparative work across regions and governance environments would be especially valuable for identifying when digital intelligence supports substantive green development and when it remains largely symbolic (Chien et al., 2021; Yang et al., 2021).

Methodologically, this agenda suggests value in combining longitudinal designs, multi-source data, and configurational approaches. Panel evidence can illuminate temporal ordering. Text analysis and digital trace data can improve measurement. Comparative and configurational research can help explain equifinal pathways, where different combinations of digital capability, responsibility structures, financing conditions, and institutional pressures produce similar green development outcomes (Garad et al., 2024; Mealy & Teytelboym, 2022).

6. CONCLUSION

This paper reframes the relationship between digital intelligence and corporate green development as a strategic and organizational problem. Its central claim is modest but important. Digital intelligence matters not simply because it introduces more advanced tools, but because it can reshape visibility, learning, and financing mechanisms that influence whether firms move from symbolic sustainability discourse toward more substantive environmental transformation. A conceptual framework built around environmental responsibility, green innovation, and financing conditions offers a more disciplined basis for future empirical research and for more credible managerial interpretation of digital sustainability claims (Dauvergne, 2022; Feng et al., 2024; Yang

et al., 2021).

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Gender pay gap in earnings and its impact on economic development: the case of Kazakhstan

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ABSTRACT

Despite improvements in educational parity and overall gender equality rankings, Kazakhstan exhibits a persistent gender pay gap rooted in structural labor market challenges. This study examines the evolution of the gap, its determinants, and its relationship with gross regional product (GRP) using a balanced panel dataset covering 14-17 oblasts and three major cities (Astana, Almaty, Shymkent) from 2011 to 2024, sourced from the Bureau of National Statistics of the Agency for Strategic Planning and Reforms.

After addressing data anomalies in early years by constructing a cleaned pay gap measure (*gappct_clean,* excluding implausible observations outside -50% to +100%, removing 18% of the sample), we estimate a random effects model with time fixed effects (supported by Hausman test, $p=0.5006$). Controls include logged male and female wages, gendered unemployment, and capital investment.

Descriptive trends show the gap fluctuating and often exceeding 35% before 2019, then narrowing around 18-23% by 2024, with persistently larger disparities in urban centers and resource-intensive regions. Econometric results reveal a positive and statistically significant association between the gender pay gap and ln(GRP) ($\beta=0.0338$, $p<0.01$), consistent with male

dominance in high-productivity oil, gas, and mining sectors. Notably, female wage increases exhibit stronger positive elasticity on regional output than male equivalents, while gendered unemployment effects remain insignificant.

These findings underscore that occupational (horizontal and vertical) segregation sustains disparities, yet enhancing women's economic participation offers substantial growth potential in this resource-based transition economy. Targeted policies for occupational integration, work-life balance, and equal-pay enforcement are discussed.
Keywords: gender pay gap, regional development, panel data, occupational segregation, Kazakhstan, GRP growth

1. Introduction

Kazakhstan, the ninth-largest country by territory with a population of just over 20 million, is an upper-middle-income economy (per capita GDP approximately USD 14,770 in recent IMF estimates). It has made notable strides in gender equality, improving its Global Gender Gap Index ranking to around 65-76th place in recent years, with near parity in education and gains in women's leadership. Yet economic participation lags: in 2022, average monthly nominal wages stood at 355,296 tenge for men and 265,762 tenge for women, implying a gap of roughly 25%. Official data indicate the ap narrowed from over 32% in 2013 to 21.7% in 2021 before fluctuating around 25% in subsequent years.

Post-Soviet transition played a pivotal role. Soviet-era quotas and formal equality gave way after 1991 to revived traditional norms, exacerbating horizontal segregation (women overrepresented in low-paid education, health, and services) and vertical segregation (limited access to leadership, especially in high-value extractive industries). This study investigates whether women's income and social status improved over two decades (focusing panel analysis on 2011-2024) and how pay inequality relates to regional socioeconomic development.

The four objectives are: (1) to define the relationship between pay inequality for men and women; (2) to identify main determinants, including segregation and institutional factors; (3) to evaluate impacts on GRP growth and gendered unemployment; and (4) to formulate policy recommendations for strengthening women's economic power.

By employing reginal panel methods, the paper addresses gaps in existing literature, which often relies on national cross-sections or pre-2020 data and under-explores dynamic links between the gap, unemployment, and GRP across oblasts. Contributions include careful data cleaning for early-period anomalies, random-effects estimation preserving inter-regional variation, and context-specific interpretation tied to Kazakhstan's resource economy.

2. Literature Review

Theoretical foundations draw from human capital theory (Becker, 1964), which attributes gaps to differences in education and experience, and extensions by Goldin and other highlighting motherhood penalties, career interruptions, and "greedy" occupations valuing long hours. Occupational segregation theories distinguish horizontal (sectoral overrepresentation) and vertical (glass ceilings) dimensions, while discrimination models include taste-based and statistical variants (Blau & Kahn, 2017).

Globally, the gap averages around 20%, with narrowing linked to GDP gains via better talent allocation (IMF, World Bank, OECD). In transition economies, post-1990s shifts saw partial closure, yet persistent gaps remain due to structural changes and norm revival.

In Central Asia, Soviet formal equality via quotas eroded after independence, with nationalism reinforcing patriarchal roles in Uzbekistan and Kyrgyzstan; Kazakhstan shows better education outcomes but lingering wage and leadership disparities, especially for rural women (Khitarishvili, 2016; Agency data).

Kazakhstan-specific studies confirm a fluctuating gap (32.2% in 2013 to 21.7% in 2021, then ~25% recently), driven by segregation: women dominate low-pay public sectors while underrepresented in oil/gas and construction (Kireyeva & Satybaldin, 2019; Bekbossinova & Vasa, 2025). Decomposition analyses (Oaxaca-Blinder) attribute portions to explainable factors (occupation, education) and unexplained residuals. Women's higher education enrollment often fails to translate into earnings due to caregiving burdens and norms (Nurgaliyeva, 2025; Yemelina et al., 2024).

Links to development emphasize that closing gaps enhances human capital, productivity, and intergenerational investment; conversely, underutilization shows growth, UNDP and World Bank estimates suggest significant per capita GDP gains from equalizing participation. This study fills gaps by providing longer-panel regional evidence and exploring interactions with unemployment and investment.

3. Data and Methods

We employ a quantitative regional panel covering 14-17 oblasts and major cities (including Astana, Almaty, Shymkent, plus newer units post-2022) for 2011-2024. Data source exclusively from Bureau of National Statistics (stat.gov.kz), ensuring official consistency. Variables include:

- Ln (GRP) in million tenge
- Ln (capital investment)
- Ln (unemployed men) and ln (unemployed women)
- Ln (average nominal wage men) and ln (average nominal wage women)
- Gappct_clean = [(male wage – female wage)/male wage] x 100, cleaned by excluding observations outside -50% to +100% (removing ~44 observations or 18%, mainly 2011-2018 anomalies from reporting issues)

Table 3.1 Overall Descriptive Statistics, Full Sample (2011–2024)

	N	Mean	Median	SD	Min	Max
ln GRP1	251	4.54	4.836	.961	0	5.525
ln CA	241	4.5	4.796	.96	0	5.485
INVEST						
ln UNM1	241	4.489	4.787	.964	0	5.481
ln UNW1	241	4.492	4.787	.959	0	5.476
ln AWM1	240	4.496	4.792	.96	0	5.481
ln AWW1	240	4.496	4.792	.96	0	5.481
gappct clean	196	35.392	26.268	22.515	0	96.552

Descriptive statistics show logged variables with means around 4.5 and SD ~0.96. The cleaned gap averages 35.4% (median 26.3%), with clear post-2018

Stabilization and decline (from highs>60% in some early years/regions to ~18-25% recently). Regional variation is pronounced: larger in urban and resource-heavy areas (e.g., Atyrau, Mangistau) versus some rural zones.

The baseline model is:

$$Ln(GRP)\{it\} = \beta_0 + \beta_1.\ gappct\_clean\{it\} + \beta_2.\ ln(AWM1)\{it\} + \beta_3.ln(AWW1)\{it\} + \beta_4.ln(UNM1)\{it\} + \beta_5.ln(UNW1)\{it\} + \beta_6.ln(CA\_INVEST)\{it\} + \alpha i + \gamma t + \varepsilon\{it\} \quad (1)$$

where i = region, t = year; α_i are region random effects; γ_t time fixed effects.

Random effects are preferred over pooled OLS (to account for unobserved heterogeneity like resource endowments and cultural norms) and fixed effects (Hausman test $\chi^2(16)=15.33$, p=0.5006 fails to reject consistency of RE; small N limits FE). Time FE absorbs common shocks.

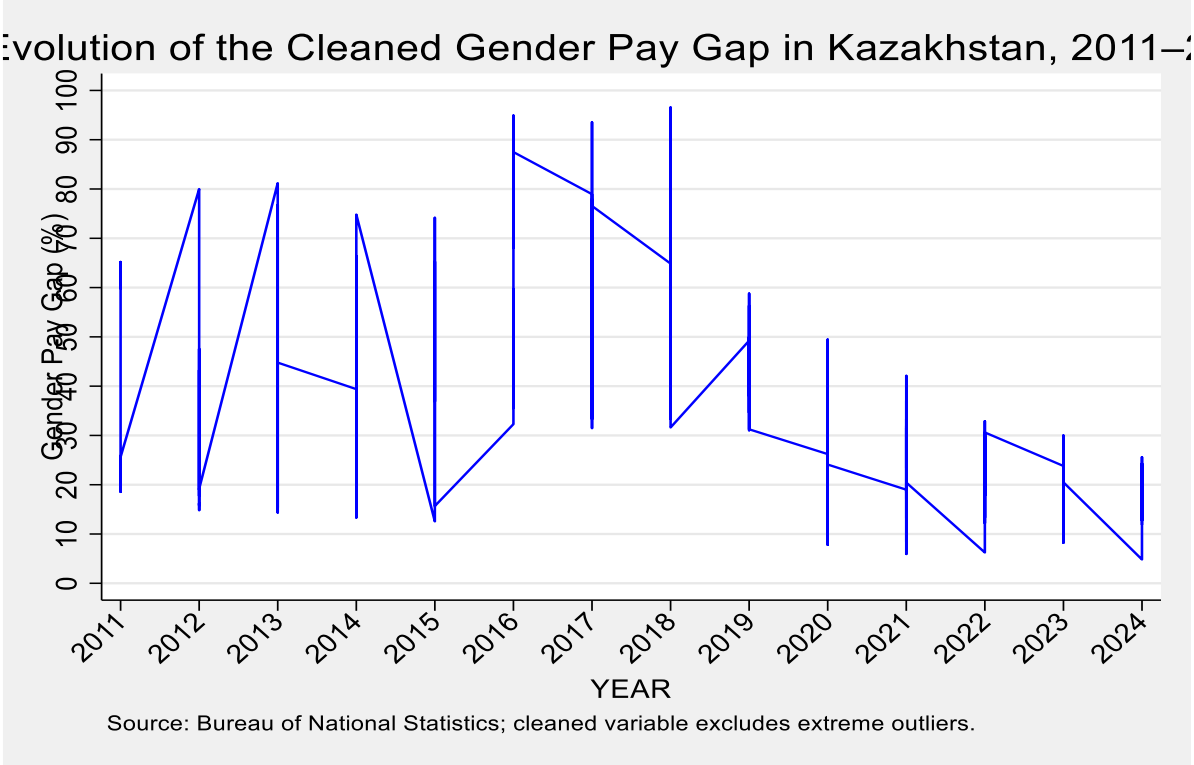
Robustness includes full/raw gap, winsorized version, exclusion of major cities, sub-period splits (2011-2018 vs. 2019-2024), median regression, and system GMM for dynamics/endogeneity concerns.

Limitations: aggregate data risks ecological fallacy; nominal wages ignore hours/part-time; early data quality issues; potential reverse causality (addressed via lags/instruments in robustness).

4. Results

Descriptive patterns confirm gap narrowing post-2018 alongside stabilization, with higher means and volatility in major cities and extractive regions – consistent with segregation literature.

Figure 4.1: Evolution of the Cleaned Gender Pay Gap in Kazakhstan, 2011-2024



Pooled OLS and fixed-effects estimates serve as benchmarks but are less suitable given regional heterogeneity.

Table 4.1: Pooled OLS Regression Results

	ln_GRP1
gappct_clean	0.0338***
	(0.008)
ln_AWM1	-1.1176***
	(0.329)

ln_AWW1	0.9816***
	(0.267)
ln_UNM1	0.0408
	(0.079)
ln_UNW1	-0.0916
	(0.067)
ln_CA_INVEST	0.0523
	(0.056)
YEAR=2011	0.0000
	(.)
YEAR=2012	0.4234**
	(0.185)
YEAR=2013	0.6798**
	(0.264)
YEAR=2014	0.3626
	(0.696)
YEAR=2015	-0.0330
	(0.963)
YEAR=2016	-0.2342
	(0.815)
YEAR=2017	-0.0894
	(0.625)
YEAR=2018	-0.1733
	(0.594)
YEAR=2019	0.0753
	(0.431)
YEAR=2020	0.4418
	(0.363)
YEAR=2021	0.5008
	(0.387)
YEAR=2022	0.5264
	(0.379)
YEAR=2023	0.8007**
	(0.357)
YEAR=2024	1.0037**
	(0.365)
Constant	4.3191***
	(1.019)
Observations	192
R-squared	0.1450

Robust standard errors clustered at regional level in parentheses. Source: Author's calculations based on Bureau of National Statistics data.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 4.2: Fixed Effects Estimation of ln(GRP)

	ln_GRP1
gappct_clean	0.0467***
	(0.018)
ln_AWM1	-1.5983***
	(0.517)
ln_AWW1	1.4566***
	(0.478)
ln_UNM1	0.0380
	(0.106)
ln_UNW1	-0.0638
	(0.091)
ln_CA_INVEST	0.0118
	(0.073)
YEAR=2011	0.0000
	(.)
YEAR=2012	0.4574
	(0.381)
YEAR=2013	0.7112*
	(0.400)
YEAR=2014	0.3995
	(0.439)
YEAR=2015	0.0141
	(0.472)
YEAR=2016	-0.1024
	(0.454)
YEAR=2017	-0.0748
	(0.422)
YEAR=2018	-0.1780
	(0.405)
YEAR=2019	0.0107
	(0.377)
YEAR=2020	0.4398
	(0.376)
YEAR=2021	0.5458
	(0.383)
YEAR=2022	0.6242*
	(0.354)
YEAR=2023	0.9109**
	(0.352)
YEAR=2024	1.1174***
	(0.354)

Constant	4.1756*
	(2.225)
Observations	192
Within R-squared	0.1517
Number of Groups	22.0000

Region and year fixed effects included. Standard errors in parentheses. Source: Author's calculations based on Bureau of National Statistics of Kazakhstan, 2011–2024.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

• The preferred random-effects model yields:

• Gappct_clean: 0.0338*** (positive, suggesting regions with larger gaps – often resource-driven with male-intensive high-productivity sectors – exhibit higher GRP)

• Ln(AWM): -1.1176**

• Ln(AWW): 0.9816*** (stronger positive elasticity for female wages, implying marginal gains for women boost output more)

• Unemployment terms: insignificant

• Ln(CA_INVEST): positive but varying significance

• Time dummies capture overall growth trends, especially post-2020 recovery

Robustness checks (alternative samples, estimators, GMM) confirm qualitative stability: the positive gap-GRP link and stronger female-wage effects persist.

Table 4.3: Random Effects Estimation of ln(GRP)

	ln_GRP1
gappct_clean	0.0338***
	(0.010)
ln_AWM1	-1.1176**
	(0.479)
ln_AWW1	0.9816***
	(0.380)
ln_UNM1	0.0408
	(0.073)
ln_UNW1	-0.0916
	(0.072)
ln_CA_INVEST	0.0523
	(0.068)
YEAR=2011	0.0000
	(.)
YEAR=2012	0.4234
	(0.365)
YEAR=2013	0.6798*
	(0.392)

YEAR=2014	0.3626
	(0.421)
YEAR=2015	-0.0330
	(0.445)
YEAR=2016	-0.2342
	(0.438)
YEAR=2017	-0.0894
	(0.408)
YEAR=2018	-0.1733
	(0.389)
YEAR=2019	0.0753
	(0.361)
YEAR=2020	0.4418
	(0.344)
YEAR=2021	0.5008
	(0.338)
YEAR=2022	0.5264
	(0.324)
YEAR=2023	0.8007**
	(0.323)
YEAR=2024	1.0037***
	(0.323)
Constant	4.3191***
	(1.222)
Observations	192
Within R-squared	0.1441
Overall R-squared	0.1450

Standard errors in parentheses. Year dummies included. Source: Author's calculations based on Bureau of National Statistics of Kazakhstan.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

5. Discussion

The positive coefficient on the pay gap appears counterintuitive against global evidence that inequality hampers growth (Goldin et., 2017). In Kazakhstan's context, however, it likely proxies industrial structure: high-GRP regions (oil/gas, mining) feature large male-dominated wage premiums, while women concentrate in lower-productivity services. This does not imply inequality is beneficial; rather, it signals underutilization of female talent.

The stronger response of GRP to female wages supports the hypothesis that raising women's earnings – via reduced segregation – could accelerate inclusive development. Insignificant unemployment effects suggest participation barriers that matter more than open unemployment.

Although a positive association between the gender pay gap and regional output may appear counterintuitive considering global evidence linking gender equality to higher growth (Goldin et al., 2017), the result in the Kazakhstani context likely reflects the country's resource-driven industrial structure rather than any inherent benefit of inequality. Regions with larger cleaned pay gaps – often exceeding 35% in early years and remaining pronounced in extractive-heavy oblasts such as Atyrau and Mangistau – tend to be those dominated by high-productivity, male-intensive sectors including oil, gas and mining. These sectors contribute disproportionately to GRP while sustaining significant horizontal segregation, with women concentrated in lower-value-added public services, education, and health. Consequently, the pay gap serves as a proxy for the prevailing economic specialization rather than a driver of growth per se. This interpretation is consistent with the descriptive patterns observed earlier, where urban centers and resource-intensive regions exhibit both higher GRP and persistently wider disparities. Notably, the markedly stronger positive elasticity of female wages ($\beta = 0.9816$, $p<0.01$) compared with male wages further suggests that reducing occupational segregation and raising women's earnings could unlock additional growth dividends through improved talent allocation, without contradicting the structural explanation for the positive gap-GRP link.

Findings align with Kazakhstan studies on segregation (Kireyeva & Satybaldin, 2019; Bekbossinova & Vasa, 2025) while extending them through dynamic regional analysis. They complement broader transition-economy literature by highlighting path-dependent norms and resource dependence.

Limitations include aggregate data, nominal wages without hours adjustment, and challenges fully identifying causality in a short panel. Future work could integrate micro-surveys or hours-adjusted measures.

6. Policy Recommendations

To translate educational gains into economic power and support sustainable development:

- Promote occupational integration through incentives for women in high-productivity sectors (oil/gas, construction, tech) and targeted training programs.
- Enhance work-life balance via expanded, affordable childcare and elderly care and flexible arrangements, reducing unpaid care burdens (women spend far more time than men).
- Strengthening enforcement with mandatory pay-gap reporting, transparent monitoring systems, and effective equal-pay legislation at national and regional levels.
- Invest in skills and leadership development, prioritizing rural and underrepresented areas to convert education into career advancement.

Such measures could narrow structural gaps, boost GRP via better talent allocation, and foster intergenerational human capital gains.

7. Conclusion

Over 2011-2024, Kazakhstan saw gradual narrowing of the gender pay gap alongside educational progress, yet structural barriers – particularly segregation in a resource-based economy – persist.

Regional panel evidence reveals a complex relationship: larger gaps correlate with higher GRP in male-intensive sectors, but female wage gains hold stronger growth potential.

This underscores the need to move beyond formal equality toward substantive opportunities. By addressing horizontal and vertical segregation and supporting work-family reconciliation, Kazakhstan can better harness its human capital for inclusive socioeconomic development. Future research should explore micro-level mechanisms and causal channels to refine these insights.

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Macroeconomic Determinants of Construction Sector Performance in Kazakhstan

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ABSTRACT

The construction sector plays a significant role in the economic development of Kazakhstan and contributes to gross domestic product, employment, infrastructure expansion, and the growth of related industries. Due to its capital-intensive nature and close dependence on the general economic environment, construction sector performance is highly sensitive to macroeconomic change. This study examines and represents the impact of a number of macroeconomic factors on construction sector performance in Kazakhstan over the period from 2010 to 2024. The analysis focuses on GDP growth, inflation, the official exchange rate, domestic credit to the private sector by banks, foreign direct investment, and stock market activity. A quantitative time-series approach is employed using annual data from the Bureau of National Statistics of the Republic of Kazakhstan and the World Bank. Construction sector performance is measured by the volume of performed construction work, converted into real terms using the GDP deflator. The econometric analysis is conducted in Stata through OLS regressions, diagnostic testing, Augmented Dickey–Fuller unit root tests, and preferred first-differenced specifications. The results show that once non-stationarity and multicollinearity are taken into consideration, and inflation emerges as the most consistent macroeconomic determinant of short-run changes in real construction activity in Kazakhstan. By contrast, GDP growth, exchange rate changes, FDI, and stock market activity do not demonstrate robust independent short-run effects in the preferred models.

KEYWORDS: construction sector, Kazakhstan, macroeconomic factors, inflation, exchange rate, FDI, credit, stock market

1. INTRODUCTION

Finance plays a fundamental role in the development of modern economies because it enables the allocation of resources from those who possess capital to those who can use it productively. Through financial systems, countries support economic growth, businesses obtain funding for expansion, and governments maintain macroeconomic stability. At the firm level, finance is equally important because it helps organizations plan expenditures, manage revenues, reduce risks, and make informed strategic decisions.

This role becomes especially important in capital-intensive sectors such as construction, where economic activity depends on large-scale investment and long project cycles. The construction of buildings and infrastructure requires substantial financial resources at every stage of implementation. At the same time, projects often last for months or even years, while payments from clients may be delayed. As a result, effective financial management becomes essential to ensure that companies can meet ongoing obligations, including payments for materials, labor, contractors, and other operating costs. Therefore, finance in construction should be understood not simply as the accounting of costs and income, but as a broader mechanism for maintaining project viability and supporting business sustainability under conditions of uncertainty.

The construction sector plays a significant role in the economy of Kazakhstan and it is considered as one of the important drivers of national growth. Its contribution to gross domestic product remains substantial, while its broader impact extends beyond direct output due to strong multiplier effects. The development of construction stimulates demand for building materials, transport services, engineering, labor, and infrastructure-related activities, thereby supporting a wide range of connected industries.

The relevance of studying the construction sector in Kazakhstan is determined by the strategic importance of the industry and its vulnerability to macroeconomic fluctuations. Due to its high capital intensity, long implementation periods, and dependence on investment and credit conditions, the sector is strongly affected by changes in GDP growth, inflation, exchange rates, and financial conditions. The main aim of this study is to examine how certain macroeconomic variables can influence construction sector performance in Kazakhstan over the period from 2010 to 2024.

2. LITERATURE REVIEW

Kazakhstan's construction industry has shown steady growth and plays an important role in national economic development. Official statistics indicate that the sector contributes substantially to GDP, employment, and related industries. This makes the construction sector a relevant subject for macroeconomic analysis, particularly in an economy where investment cycles and price stability matter strongly for project implementation and sectoral expansion.

Table 1. Summary of selected literature on macroeconomic determinants of the construction sector

Author(s) and year	Title / Focus	Time period	Methodology	Key findings
Puci, Demi, and Kadiu (2023)	Impact of macroeconomic	2010–2020	Panel data regression	GDP growth and interest rates positively affect

	variables on the construction sector			construction profitability, while inflation and exchange rate have negative effects.
Qabaja and Tenekeci (2024)	Inflation, interest rates, construction sector and economic growth	1991–2022	Econometric analysis	Inflation and interest rates are important macroeconomic factors affecting construction activity.
Sukhadolets et al. (2021)	FDI, construction investment and crises	2005–2020	ARDL / cointegration	FDI and construction investment may support long-term economic development, though effects differ across countries.
Erfina and Kurniasih (2019)	Macroeconomic factors and stock returns of construction firms	2013–2017	Panel data regression	Exchange rate and broader market conditions affect construction-related market performance.
Sun, Mitra, and Simone (2013)	Boom and bust in European construction	1990–2011	Cross-country econometric analysis	Credit conditions and stock market development are associated with construction booms and subsequent corrections.
Mubarok, Khurniawan, and Irmawaty (2023)	Bank credit and the construction industry	2004–2022	Vector Error Correction Model	Macroeconomic conditions significantly affect bank credit to construction in the long run.

2.1 GDP growth

In the literature, economic growth is usually considered one of the key external factors affecting construction activity. GDP growth reflects the overall expansion of economic activity, stronger investment demand, and an improved business environment, which are especially relevant for the construction industry because it is closely linked to infrastructure and development projects.

Puci et al. (2023) examined the impact of macroeconomic factors on the profitability of construction companies in Albania using panel data from 36 companies over 2010–2020. Their results showed that GDP growth and interest rates had positive effects, while inflation and exchange rate movements had negative effects on profitability. This study confirms the high sensitivity of the construction sector to the macroeconomic environment.

2.2 Inflation

Inflation is one of the most frequently discussed macroeconomic factors in construction research because it directly affects the cost of materials, labor, transport, and financing. Rising inflation may therefore reduce the real growth of the sector even when nominal construction values continue to rise.

Qabaja and Tenekeci (2024) analyzed the effect of inflation and interest rates on the construction sector and economic growth across nine countries over 1991–2022. Their findings show that inflation and interest rates often hinder the development of construction by increasing financing costs and reducing investment attractiveness. Although the strength of this effect differs across countries, the general conclusion is that the construction sector is highly sensitive to inflationary pressure.

2.3 Foreign direct investment

Foreign direct investment is commonly viewed as a source of long-term capital that may support infrastructure development, commercial construction, and broader economic modernization. However, the construction impact of FDI often depends on the sectoral structure of the receiving economy.

Sukhadolets et al. (2021) studied FDI, construction investment, and economic crises across seven countries over 2005–2020 using ARDL and cointegration techniques. The authors found that FDI and construction investment may support long-term development, but the strength of this relationship varies substantially across countries depending on their institutional and economic structure.

2.4 Financial conditions: credit, exchange rate, and stock market activity

Several studies emphasize that construction performance depends not only on aggregate growth but also on financial conditions. Softer credit conditions can support construction booms, while tighter financing and weaker financial markets may slow the sector.

Sun, Mitra, and Simone (2013) showed that favorable credit conditions and stock market development were associated with higher construction shares in GDP in Europe before the crisis period. Mubarok et al. (2023) also demonstrated that macroeconomic conditions significantly affect bank lending to the construction industry in the long run. In addition, Erfina and Kurniasih (2019) found that exchange rate and related market conditions affected the profitability of construction-related firms. Together, these studies justify the inclusion of credit, exchange rate, FDI, and stock market variables in the present analysis.

3. DATA AND METHODOLOGY

This study uses a quantitative time-series approach to examine the macroeconomic determinants of construction sector performance in Kazakhstan. The analysis is conducted at the national level, meaning that the unit of analysis is the construction sector of Kazakhstan as a whole rather than individual firms or regions. The study covers a 15-year period from 2010 to 2024.

The empirical analysis is based entirely on secondary annual data. Data on the volume of performed construction work in Kazakhstan were taken from the Bureau of National Statistics of the Republic of Kazakhstan. The macroeconomic variables were taken from the World Bank's World Development Indicators database. An important methodological consideration is the limited availability of publicly accessible firm-level data in Kazakhstan. Publicly available and sufficiently consistent financial data on construction companies only began to appear in usable form very recently, mainly from 2024 onward, making a meaningful long-term firm-level panel infeasible.

The dependent variable is construction sector performance, proxied by the volume of performed construction work in Kazakhstan. Because the original construction series is reported in nominal terms, it was converted into real values using the GDP deflator (linked series), rebased so that 2010 = 100. The final dependent variable used in the regression analysis is the natural logarithm of real construction work.

The core explanatory variables in the baseline model are GDP growth, inflation, the official exchange rate, and domestic credit to the private sector by banks. Additional variables used in alternative specifications are FDI net inflows and stocks traded as a percentage of GDP. The GDP deflator is used only as a transformation variable and is not included in the regressions as an explanatory variable.

Table 2. Summary of variables used in the empirical analysis

Variable	Description	Role

ln(real construction work)	Natural logarithm of real volume of performed construction work	Dependent
GDP growth	Annual GDP growth (%)	Independent
Inflation	Consumer price inflation (%)	Independent
Official exchange rate	LCU per US$, period average	Independent
Domestic credit to private sector by banks	% of GDP	Independent
FDI net inflows	% of GDP	Alternative independent
Stocks traded, total value	% of GDP	Alternative independent
GDP deflator (linked series)	Used to deflate nominal construction work	Transformation only

The baseline model estimated in Stata is specified as follows:

$$ln(RealConstruction\_t) = \beta 0 + \beta 1 GDPGrowth\_t + \beta 2 Inflation\_t + \beta 3 ExchangeRate\_t + \beta 4 Credit\_t + \varepsilon\_t$$

Because the sample contains only 15 annual observations, the main model is intentionally kept parsimonious. Alternative models replace domestic credit with FDI and with stock market activity. OLS regression is used together with descriptive statistics, correlation analysis, VIF testing, heteroskedasticity testing, autocorrelation testing, and Augmented Dickey–Fuller unit root testing.

4. RESEARCH RESULTS

4.1 Sequence of the empirical analysis

The empirical analysis was conducted in Stata in several consecutive stages in order to ensure that the final regression results were both statistically and methodologically reliable. First, the variables were imported and arranged as annual time-series data for Kazakhstan covering the period 2010–2024. Second, OLS regressions in levels were estimated to observe preliminary relationships between macroeconomic indicators and construction sector performance. Third, diagnostic tests were applied to check multicollinearity, heteroskedasticity, and serial correlation. Fourth, Augmented Dickey–Fuller tests were conducted to examine stationarity in levels and in first differences. Finally, preferred models were estimated using first-differenced variables after the non-stationarity problem had been identified.

Not all explanatory variables were included in one single final regression. This decision was made deliberately because the dataset contains only 15 annual observations, and only 14 observations after first differencing. Estimating a model with too many regressors under such conditions would increase the risk of overfitting, unstable coefficients, and weak interpretability. In addition, the diagnostic stage revealed multicollinearity, particularly between the exchange rate and domestic credit variables.

Before proceeding to the regression results, it is useful to illustrate the dynamics of the construction sector visually. Figure 1 presents the official nominal volume of performed construction work in Kazakhstan over the period 2010–2024. Figure 2 presents the same series in real terms after deflation using the GDP deflator.

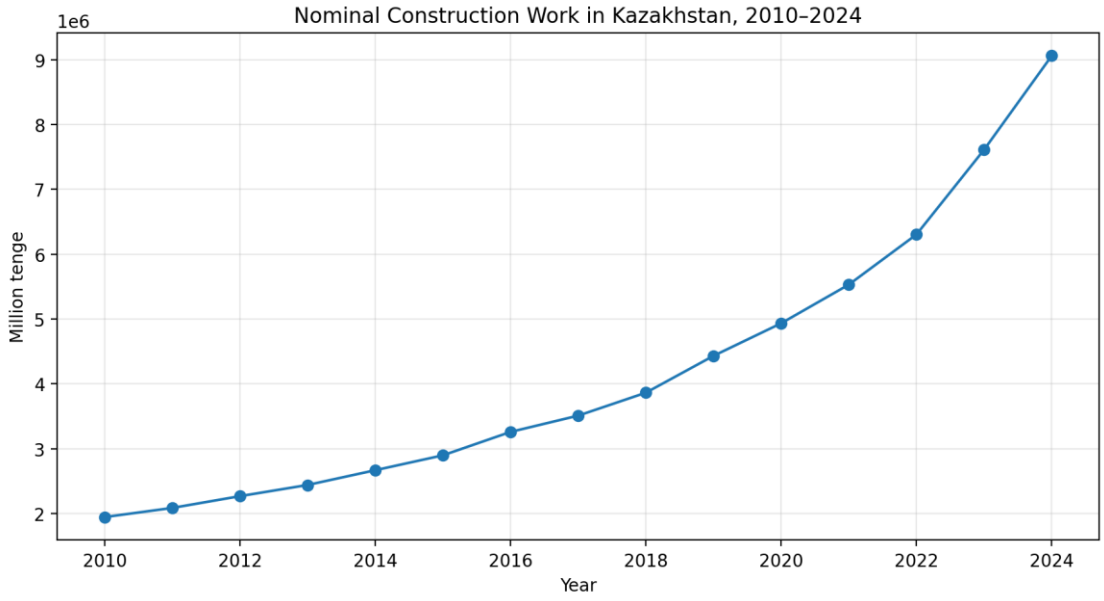


Figure 1. Nominal construction work in Kazakhstan, 2010–2024 (million tenge).

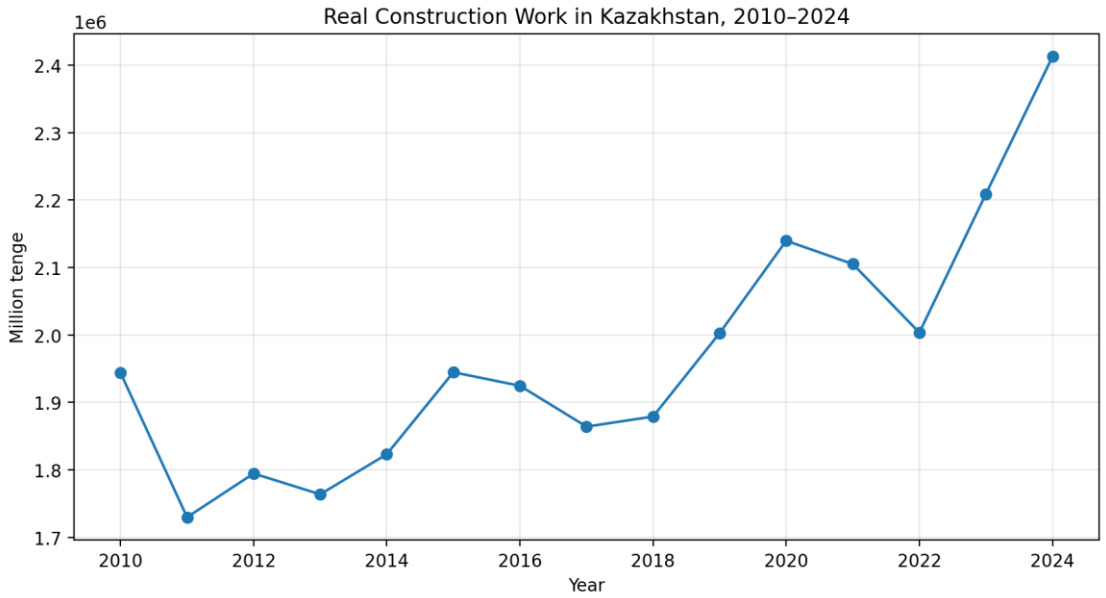


Figure 2. Real construction work in Kazakhstan, 2010–2024 (million tenge, deflated).

4.2 Preliminary OLS regression results in levels

The first regression stage in Stata estimated the relationship between macroeconomic variables and construction sector performance in levels. The dependent variable was ln_real_cons, the natural logarithm of real construction work. The baseline model compared construction sector performance with GDP growth, inflation, the official exchange rate, and domestic credit to the private sector by banks. Alternative models replaced domestic credit with FDI and stocks traded, while reduced models excluded either exchange rate or domestic credit in order to compare explanatory power.

Table 3. OLS regression results in levels (robust standard errors)

Variable	Baseline model	Without credit	Without exchange rate	With FDI	With stocks
GDP growth	0.0004 (p=0.898)	0.0023 (p=0.719)	-0.0015 (p=0.849)	0.0017 (p=0.833)	0.0028 (p=0.697)
Inflation	-0.0141 (p=0.001)	-0.0028 (p=0.564)	0.0053 (p=0.298)	-0.0021 (p=0.766)	-0.0028 (p=0.585)
Exchange rate	0.0018 (p=0.000)	0.0006 (p=0.005)	—	0.0006 (p=0.029)	0.0006 (p=0.008)

Domestic credit	0.0232 (p=0.000)	—	-0.0076 (p=0.051)	—	—
FDI	—	—	—	0.0043 (p=0.837)	—
Stocks traded	—	—	—	—	0.0073 (p=0.888)
Observations	15	15	15	15	15
R-squared	0.9430	0.6720	0.3869	0.6727	0.6725
Prob > F	0.0000	0.0065	0.0673	0.0197	0.0187

The level regressions initially produced strong-looking results. In the baseline model, inflation had a statistically significant negative coefficient, while both the official exchange rate and domestic credit had statistically significant positive coefficients. However, these results could not be treated as final because time-series regressions in levels may reflect shared trends rather than true economic relationships.

4.3 Diagnostic testing of the level model

After the preliminary regressions in levels, diagnostic tests were carried out in Stata. The Variance Inflation Factor test, estimated using estat vif after the baseline OLS regression, showed that exchange rate and domestic credit were strongly correlated. The Breusch–Pagan / Cook–Weisberg test did not detect heteroskedasticity, and the Breusch–Godfrey LM test did not detect first-order serial correlation.

Table 4. Diagnostic tests for the baseline level model

Test	Purpose	Result	Interpretation
VIF	Multicollinearity	Exchange rate = 11.55; Credit = 9.28; Mean VIF = 6.02	Multicollinearity is present
Breusch–Pagan / Cook–Weisberg	Heteroskedasticity	p = 0.5014	No heteroskedasticity detected
Breusch–Godfrey LM (lag 1)	Serial correlation	p = 0.7931	No first-order autocorrelation detected

4.4 Stationarity testing and the need to re-estimate the model

Because the analysis relies on annual time-series data, the next step in Stata was to test the variables for stationarity using the Augmented Dickey–Fuller test with the dfuller command. The variables were first tested in levels and then in first differences.

Table 5. ADF test results in levels

Variable	p-value	Stationary at 5%?
ln_real_cons	0.9552	No
gdp_growth	0.1177	No
inflation	0.1883	No
exch_rate	0.8529	No
credit	0.7165	No
fdi	0.1121	No
stocks	0.2172	No

None of the variables were stationary in levels, which raised the risk of spurious regression. The series were therefore transformed into first differences and tested again.

Table 6. ADF test results in first differences

Variable	p-value	Stationary at 5%?
d_ln_real_cons	0.0471	Yes
d_gdp_growth	0.0440	Yes
d_inflation	0.0508	Borderline
d_exch_rate	0.0942	Borderline at 10%
d_credit	0.6723	No
d_fdi	0.0008	Yes
d_stocks	0.0000	Yes

The first-difference results were much more suitable for regression analysis. The dependent variable, GDP growth, FDI, and stock market activity became stationary after differencing. Inflation and the exchange rate were retained with caution because their p-values were close to

conventional thresholds, while domestic credit remained non-stationary even after first differencing and was therefore excluded from the preferred final specification.

4.5 Preferred regressions in first differences

After addressing non-stationarity, the preferred empirical analysis was re-estimated in Stata using OLS with robust standard errors on the differenced variables. These regressions assess how changes in macroeconomic variables are associated with changes in the growth of real construction work in Kazakhstan.

Since the final interpretation is based on first-differenced variables, it is useful to illustrate the short-run movement of the key series. Figure 3 shows inflation in Kazakhstan over the period under study, while Figure 4 presents the approximate growth of real construction work.

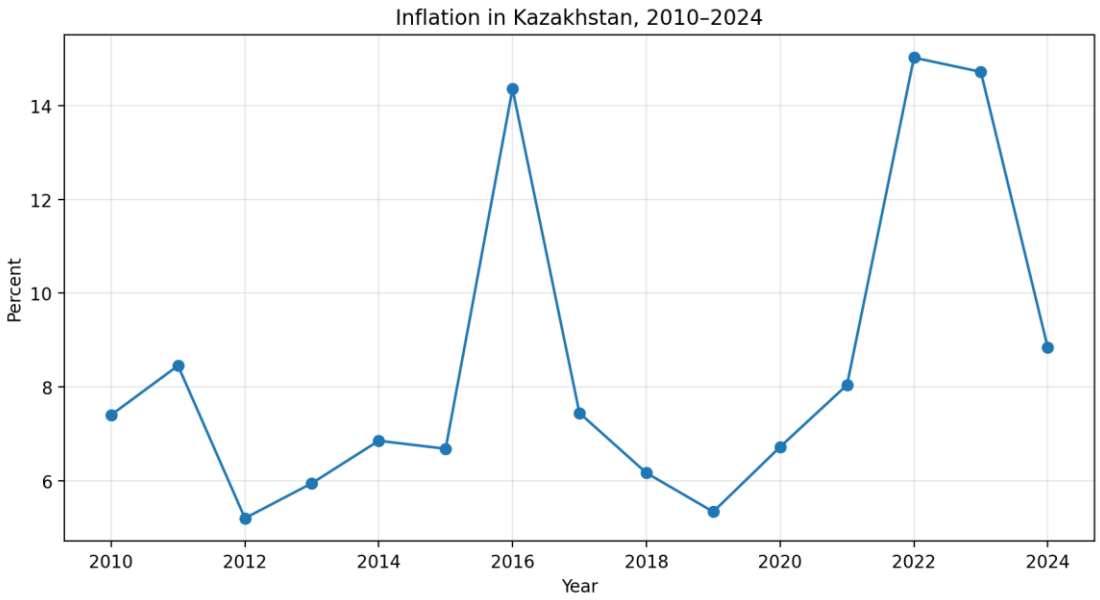


Figure 3. Inflation in Kazakhstan, 2010–2024 (%).

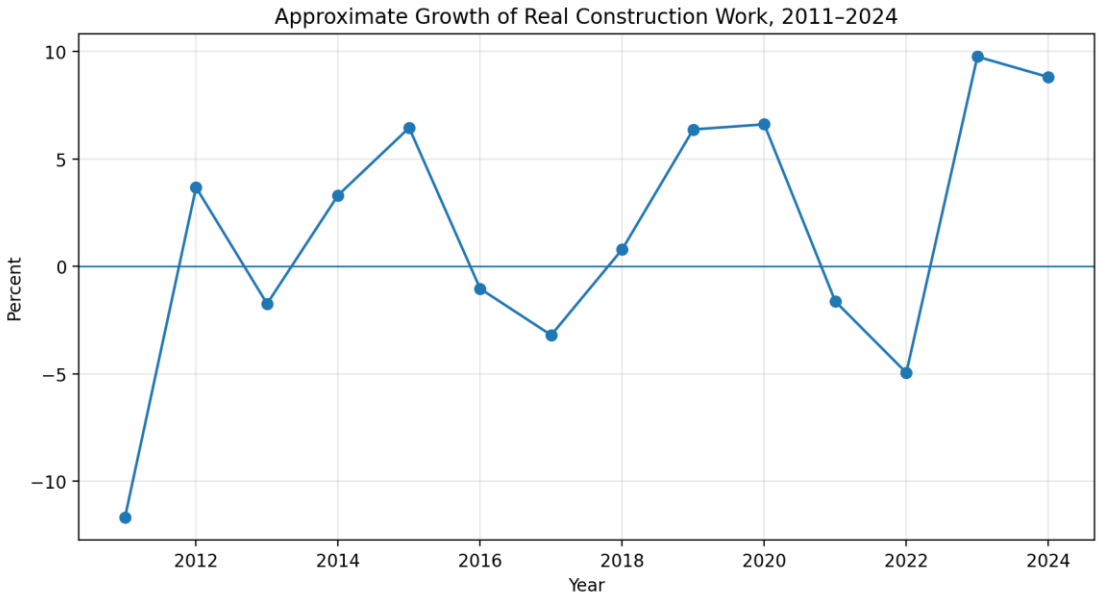


Figure 4. Approximate growth of real construction work, 2011–2024 (%).

Table 7. Preferred OLS regression results in first differences (robust standard errors)

Variable	Baseline differenced model	With FDI	With stocks
d_gdp_growth	-0.0054 (p=0.125)	-0.0044 (p=0.296)	-0.0043 (p=0.182)
d_inflation	-0.0099 (p=0.082)	-0.0113 (p=0.000)	-0.0094 (p=0.111)
d_exch_rate	0.0008 (p=0.280)	0.0005 (p=0.719)	0.0010 (p=0.212)
d_fdi	—	0.0043 (p=0.719)	—
d_stocks	—	—	0.0295 (p=0.231)
Observations	14	14	14
R-squared	0.3240	0.3471	0.3606
Prob > F	0.0684	0.0010	0.0383

The differenced regressions produce more conservative but more reliable results than the regressions in levels. In the baseline differenced model, the overall model is only marginally significant at the 10% level, and inflation is the only variable approaching statistical significance. In the model that includes FDI, inflation becomes strongly significant and remains negative, while

FDI itself is not statistically significant. In the model with stocks traded, the overall regression is statistically significant, but none of the individual coefficients are significant at conventional levels.

4.6 Interpretation of the results

The comparison between the level regressions and the differenced regressions is one of the most important findings of the study. In the level models, the exchange rate and domestic credit appeared to be strong determinants of construction sector performance. However, once the stationarity problem was taken into account and the regressions were re-estimated in first differences, these strong coefficients did not remain robust. This indicates that the earlier results were likely influenced by common time trends rather than by stable short-run economic relationships.

Across the preferred differenced specifications, the most consistent finding is the role of inflation. Inflation shows a negative relationship with the growth of real construction work and is the only variable that demonstrates relatively stable explanatory power in the final models. This suggests that inflationary pressure may reduce real construction activity in Kazakhstan by increasing the cost of materials, labor, transport, financing, and project execution.

Figure 5 makes this relationship visually clearer by comparing the change in inflation with the growth of real construction work. Although the graph is descriptive and does not replace the regression analysis, it supports the negative association observed in the preferred models.

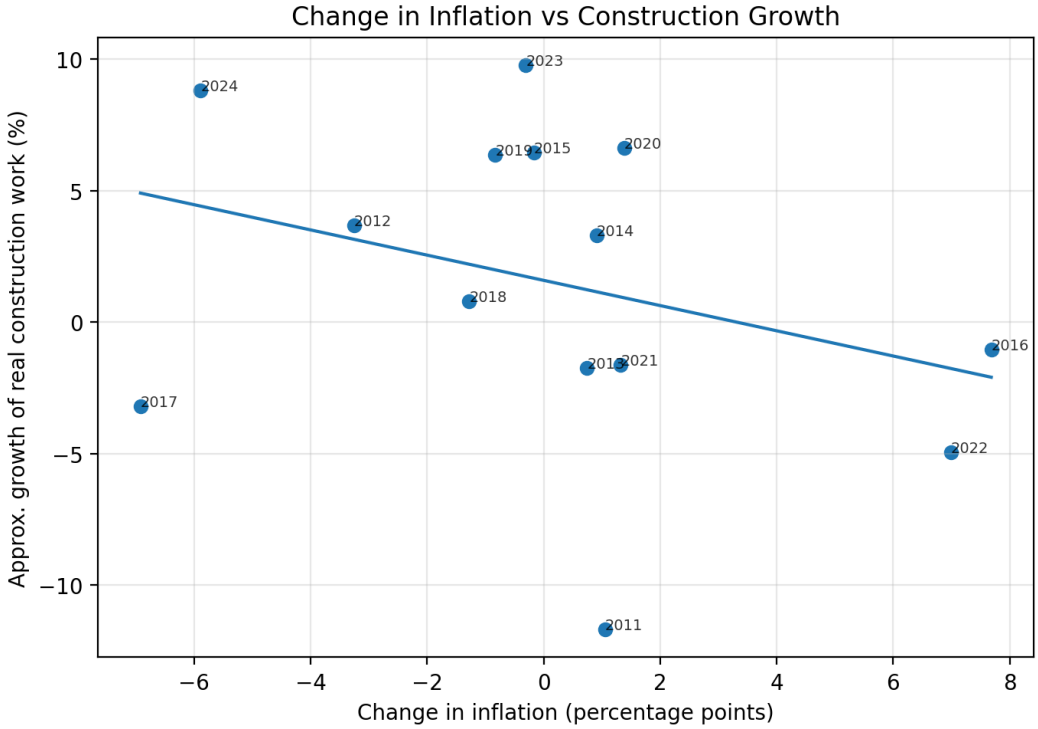


Figure 5. Change in inflation and growth of real construction work.

4.7 Summary of the empirical findings

The empirical analysis conducted in Stata provides several important insights into the relationship between macroeconomic variables and construction sector performance in Kazakhstan. Overall, the results show that the interpretation of the findings depends heavily on the statistical properties of the data and on the choice of model specification.

The initial regressions estimated in levels appeared to produce strong results, especially for inflation, the official exchange rate, and domestic credit to the private sector. However, these level regressions could not be treated as the final basis for interpretation because the Augmented Dickey–Fuller tests showed that the variables were non-stationary in levels. This means that the strong coefficients observed in the first regressions may have partly reflected common time trends rather than stable economic relationships.

The diagnostic stage also revealed that the baseline level model suffered from multicollinearity, particularly between the exchange rate and domestic credit variables. This is important because multicollinearity makes it difficult to separate the independent contribution of each variable and may result in unstable coefficients.

For these reasons, the final interpretation of the thesis relies on the regressions estimated in first differences. Once the analysis was re-estimated in that form, the results became much more conservative. GDP growth, exchange rate changes, FDI, and stock market activity did not show robust independent short-run effects. By contrast, inflation emerged as the most consistent variable across the preferred specifications. Its coefficient remained negative and more stable than the coefficients of the other macroeconomic indicators, suggesting that inflationary pressure has a meaningful adverse effect on short-run construction sector growth in Kazakhstan.

5. DISCUSSION

The purpose of this study was to examine how selected macroeconomic variables have an impact on construction sector performance in Kazakhstan. The discussion of the results should be based primarily on the first-differenced models because the stationarity tests showed that the variables in levels were unsuitable for final interpretation.

The main finding of the study is that inflation appears to be the most consistent macroeconomic determinant of construction sector dynamics in Kazakhstan. This result is economically possible and also consistent with the structure of the construction industry itself. Construction depends heavily on the cost of materials, labor, transportation, imported equipment, and financing. When inflation rises; consequently, all of these cost components tend to increase. Even if in the case where the nominal value of construction output grows, the real expansion of the sector may slow down because companies may face higher input costs and lower real margins.

By contrast, GDP growth did not have a statistically significant independent effect in the preferred models. Although construction is often expected to expand together with the broader economy, GDP growth may be too broad a variable to capture the short-run movement of the sector in Kazakhstan. Besides, construction depends not only on aggregate output growth but also on price pressure, financing conditions, public investment cycles, and implementation delays.

The role of the exchange rate is also broad for consideration. In the regressions estimated in levels, the official exchange rate appeared to be one of the strongest and most significant variables. However, once the analysis was re-estimated in first differences, the exchange rate suddenly lost its statistical significance. This suggests that its earlier apparent effect was likely influenced by common upward trends in the data rather than by a stable short-run causal relationship which makes it less predictable and not under control.

Domestic credit to the private sector by banks looked economically relevant in the level regressions, which is intuitive given the capital-intensive nature of construction. Nevertheless, domestic credit was strongly correlated with the exchange rate and remained non-stationary even after first differencing. For this reason, it could not be retained in the preferred final specification in a statistically reliable way.

The results for FDI and stock market activity were also weaker than theory might suggest. This may reflect the structure of Kazakhstan's economy, where FDI is concentrated heavily in extractive industries such as oil and gas sectors, and where construction activity depends more strongly on banking conditions, government programs, and direct project financing than on stock market trading volume.

From a policy perspective, the findings suggest that inflation control is especially important and even vital for supporting the construction sector in Kazakhstan. Hence, the inflation was the only variable to show a relatively consistent negative effect in the preferred models, policies aimed at reducing inflationary pressure may indirectly support real construction activity by lowering cost uncertainty and improving project practicability.

6. CONCLUSION

This work investigated about the macroeconomic determinants of construction sector performance in Kazakhstan over the period 2010–2024. The analysis was motivated by the economic importance of construction in Kazakhstan, where the sector makes contribution to national output, infrastructure development, employment, the activity of related industries, etc.

Construction sector performance was measured by the volume of performed construction work, converted from nominal to real values using the GDP deflator and transformed into its natural logarithm. The econometric analysis was conducted in Stata, beginning with regressions in levels and then moving to first-differenced models after diagnostic and stationarity testing.

The final results were more conservative than the preliminary regressions in levels. Among the variables examined, inflation emerged as the most consistent macroeconomic factor affecting

construction sector performance in Kazakhstan. Across the preferred differenced models, inflation showed a negative relationship with changes in real construction activity. In contrast, GDP growth, exchange rate changes, FDI, and stock market activity did not demonstrate robust independent short-run effects in the preferred models.

The study therefore provides an empirical assessment of macroeconomic determinants of construction sector performance in Kazakhstan using publicly available data over a recent fifteen-year period. It also demonstrates the importance of applying proper time-series diagnostics before interpreting regression coefficients. Despite limitations related to the small annual sample and the use of the GDP deflator rather than a construction-specific price index, the analysis suggests that price stability is especially important for supporting sustainable construction sector development in Kazakhstan.

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Fact-Checking of News on Social Media in Kazakhstan (2017–2025): A Narrative Review

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Extended abstract

Introduction

Misinformation, disinformation, malinformation, and other forms of false or misleading information have become key challenges of the digital age. Contemporary academic research shows that this problem is significantly broader than the mere spread of false messages online. It is closely linked to the transformation of the communication environment itself: the speed of information circulation, its high visibility, the emotional saturation of content, and the algorithmic logic of platforms that determines which messages receive the most user attention. Social networks generally distribute sensationalist, conflictual, and polarizing content more effectively than verified and reliable information. As a result, misleading claims can spread rapidly and on a large scale before journalists, state institutions, or fact-checkers can react (Wardle & Derakhshan, 2017; Tandoc, Zheng, & Ling, 2019; Vosoughi, Roy, & Aral, 2018). Under these conditions, fact-checking has evolved from a traditional journalistic tool into an independent verification practice aimed at restoring epistemic reliability in the digital environment (Graves, 2018).

Despite the rapid growth of global literature on fake news and fact-checking, the vast majority of research remains focused on Western democratic countries. Kazakhstan presents a case of particular analytical interest, as it combines a high level of digital engagement among the population with a politically constrained and legally ambiguous media environment. Social networks play a central role in news consumption, especially among the youth, while traditional media operate under limited freedom of expression (DataReportal, 2024; Freedom House, 2023; Reporters Without Borders, 2024). These characteristics make Kazakhstan a relevant case for analyzing how disinformation and fact-checking function not within a classical liberal-democratic or strictly authoritarian model, but within a hybrid media system.

Purpose

The purpose of this study is to analyze the functioning of fact-checking in Kazakhstan's social media news environment from 2017 to 2025, and to assess its current state, scientific

significance, and potential role in mitigating the spread of disinformation. The study is structured around three research questions:

What forms of disinformation dominate the social media news environment in Kazakhstan during 2017–2025 according to academic literature and monitoring data?

What is known about the key actors in fact-checking, verification practices, and the impact of legal and political constraints on the development of fact-checking in Kazakhstan?

What data exists regarding audience reach, trust, and the perceived effectiveness of fact-checking interventions in Kazakhstan's platform-dominated information environment?

This study fills a significant gap in the existing literature. While individual works on Kazakhstan have been published, they remain fragmented and typically focus on specific aspects—regulation, media literacy, information consumption, or fake news. To date, there is no holistic analysis of fact-checking at the structural, institutional, and societal levels (Akkalieva, 2025; Tolegen, Sultanbayeva, Mukanov, & Kalibekuly, 2025; UNESCO, 2025).

Method

The study employs a structured narrative literature review. This approach was chosen due to the high variability of available sources, which include peer-reviewed academic publications as well as analytical reports from international and professional organizations such as UNESCO, Freedom House, IREX, OECD, and the OSCE. In the Kazakhstani context, a significant portion of relevant knowledge about fact-checking is presented in institutional and expert sources rather than in indexed academic journals. For this reason, a narrative review is methodologically more appropriate than a formal systematic review.

The review includes 36 sources published between 2017 and 2025. The analysis is structured around three interconnected analytical blocks:

Platform dynamics and information circulation;

Audience trust and perception;

Governance, regulation, and institutional constraints (Adams, Smart, & Huff, 2017; Snyder, 2019).

Expected results

The study is expected to confirm that disinformation in Kazakhstan should be viewed not as an isolated information failure, but as a systemic product of the digital communication environment. Platform logic—centered on novelty, visibility, and emotional engagement—creates favorable conditions for the rapid spread of false or misleading content. B In the Kazakhstani context, these dynamics are likely amplified by high audience dependence on social networks, high mobile internet penetration, and a bilingual (Kazakh-Russian) information environment, which

facilitates the fragmented and accelerated spread of narratives (DataReportal, 2024; Demoscope, 2022).

The review is also expected to show that despite the institutionalization of fact-checking as an independent practice with its own procedures and standards, its real effectiveness remains limited and ambiguous. International research indicates that the impact of fact-checking depends on several conditions, including the perceived credibility of the source, timeliness of the debunking, message repetition, visibility on the platform, and the audience's pre-existing cognitive and political predispositions (Nyhan & Reifler, 2015; Walter, Cohen, Holbert, & Morag, 2020). In Kazakhstan, additional institutional constraints are expected, including limited resources, uncertain audience reach, and the difficulties of operating in a politically sensitive and legally ambiguous environment (Akkalieva, 2025; Freedom House, 2023; Reporters Without Borders, 2024; Tolegen et al., 2025).

Furthermore, the study posits that there is uneven social vulnerability to disinformation. Levels of media literacy and critical thinking likely vary significantly based on age, education level, and access to quality information resources (Lewandowsky, Ecker, & Cook, 2020; UNESCO, 2025). Particular attention will be paid to young users, as they are among the most active digital audiences and rely more frequently on influencers, bloggers, and social media content than on traditional media. This likely increases the risk of exposure to false information and reduces the likelihood of sustained trust in verified news content.

Broadly, the review is expected to demonstrate that disinformation in Kazakhstan cannot be adequately explained through a single level of analysis. Its persistence is formed through the interaction of structural factors, institutional vulnerability, and uneven audience perception. Platform algorithms increase the visibility of misleading content; institutional constraints weaken the reach and authority of debunking efforts; and audience characteristics determine whether disinformation or fact-checking will be noticed, accepted, or ignored. Consequently, the study expects to conclude that fact-checking in Kazakhstan is a necessary but structurally limited mechanism within a hybrid media environment.

Discussion

The expected results suggest that the key problem in Kazakhstan lies not so much in the presence of disinformation itself, but in the imbalance between the scale and speed of its spread and the limited capabilities of fact-checking. This shifts the analytical focus from the simplistic question of "does fact-checking work?" to a more precise one: under what institutional, platform, and social conditions can it be effective in a hybrid media system? In Kazakhstan’s current environment, these prerequisites are only partially present. Despite the formal flexibility of the legal framework, the level of institutional trust remains unstable, and platform architecture is not

geared toward prioritizing reliable information (Freedom House, 2023; Gillespie, 2018; Guriev & Treisman, 2019; Reporters Without Borders, 2024).

The study also holds significant theoretical importance. It is expected to show the limitations of directly transferring dominant global models of disinformation and fact-checking analysis to semi-authoritarian and hybrid political-communication contexts. Much of the existing literature assumes the presence of more stable guarantees for journalistic activity, clearer legal frameworks, and higher levels of public trust than those observed in Kazakhstan (Bennett & Livingston, 2018; Graves, 2018; Walter et al., 2020). In this sense, the Kazakhstani case underscores the need to adapt universal theoretical models to specific political, legal, and communicative conditions (Freedom House, 2023; Greitens, 2020; Guriev & Treisman, 2019).

From a practical standpoint, the study is expected to conclude that the development of fact-checking cannot be limited to supporting individual organizations or initiatives. It requires broader ecosystem support: increasing media literacy, enhancing the visibility of verified information on digital platforms, strengthening institutional trust, and accounting for the regulatory environment (Gillespie, 2018; UNESCO, 2025; Wardle & Derakhshan, 2017). Without these conditions, fact-checking risks maintaining a primarily symbolic function, while its practical impact on reducing disinformation remains limited (Amazeen, 2015; Graves, 2018; Walter et al., 2020).

Finally, the review is expected to identify four persistent gaps in the existing literature:

- Fragmented research dedicated specifically to Kazakhstan;
- An extremely limited number of longitudinal studies;
- Insufficient integration of structural, institutional, and social levels of analysis;
- A lack of direct empirical assessments of fact-checking effectiveness.

Thus, the primary contribution of this study will be an integrative analytical framework that provides a holistic picture of how disinformation and fact-checking interact within Kazakhstan's hybrid media landscape, laying the groundwork for further research into visibility, trust, and the effectiveness of corrective mechanisms (Akkalieva, 2025; Snyder, 2019; Tolegen et al., 2025; UNESCO, 2025).

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Keywords: Kazakhstan; fact-checking; misinformation; disinformation; social media; hybrid media systems; media literacy; information disorder; digital authoritarianism; narrative literature review

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The Impact of Artificial Intelligence and Digital Innovation on Accounting and Tax Practices

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ABSTRACT

This research paper examines how artificial intelligence (AI) and digital transformation affect bookkeeping and taxation. It investigates the use, benefits, and challenges of AI tools for businesses. The study also considers how AI affects the daily tasks of bookkeeping and tax professionals.

This study mainly uses a qualitative approach, drawing on interviews and surveys with bookkeeping and tax professionals from a Big 4 company's Tax & Legal department. These professionals handle bookkeeping, tax, communication, administrative, and other tasks, offering a broad perspective. Fifty participants included consultants, senior consultants, assistant managers, and managers. The survey covered AI use, its pros and cons, and the challenges of integrating AI into business processes.

Results from the survey illustrate the extent to which digital tools are already part of professionals' daily routines. Respondents said that AI helps save time and reduces routine manual tasks. For example, automated systems assist with accounting, transaction processing, and financial reporting. Many participants also noted that digital systems make financial data more accurate and speed up report generation.

The study shows AI benefits tax accounting. Some respondents said digital systems help check tax data and reduce errors. Certain tools help estimate tax liabilities and support financial planning. However, AI cannot replace professional judgment; accountants must still analyze information and make decisions based on their expertise.

KEYWORDS: Artificial intelligence, digital innovation, accounting, taxation, business processes, work

1. INTRODUCTION

Traditionally, accountants' responsibilities are divided by business process. AI, however, could replace many accounting and auditing tasks, increasing productivity and changing the

division of labor. AI may also help accountants improve the quality and efficiency of their work. Advances in computer technology have made accounting systems more than just paper records. Computer systems now document calculations and transactions, creating databases with accounting data relevant to specific business transactions.

Many companies have only recently begun using artificial intelligence in accounting and auditing, but progress is significant. For instance, KPMG announced its adoption of IBM Watson to examine financial data and identify profit opportunities. AI use is shaping the future of accounting and affecting the labor market. Accountants, always analysts, now play a vital role in providing client data. New technologies drive change, influencing both the role and demand for accountants. Big data and cloud computing allow greater data collection and analysis, expanding predictive financial analysis and supporting accurate processing, risk control, and forecasting.

In recent years, digital technologies have led to major changes in many areas of business and financial management. The rapid development of digital systems, data processing methodologies, and cloud solutions has fundamentally changed the management of financial information within organizations. Digital innovations are increasingly impacting accounting and financial reporting, which have previously relied on manual processes and traditional protocols. As a result, many organizations are adopting automated systems to speed up the processing, storage, and analysis of financial data. One of the most significant advances in this process is the growing use of artificial intelligence and big data technologies in finance and accounting. Artificial intelligence enables corporations to analyze vast amounts of financial data, identify trends, and automate routine accounting procedures. Meanwhile, big data technologies enable more efficient analysis of intricate financial data, thereby supporting more informed decision-making. These technologies are gradually being integrated into modern financial management practices.

The growing adoption of digital technologies is transforming the roles of accountants and tax professionals. Historically, these responsibilities included manual data entry, bookkeeping, and financial reporting, but many of these tasks can now be automated with AI-powered digital tools. Practitioners are shifting toward data analysis, financial interpretation, and strategic consulting instead of routine administration.

Digital advances have significantly impacted tax accounting rules and regulations. Tax reporting procedures are now simplified through software platforms that automate calculations, verify information, and streamline interactions with authorities.

As a result, accountants are shifting from routine tasks to data analysis, financial interpretation, and consulting. Digital innovations also affect tax compliance. Digital applications now streamline tax reporting by automating calculations, validating data, and simplifying interactions with authorities. AI in accounting and auditing offers major benefits, including improved forecasting, risk mitigation, and cost reductions. However, these gains require specialized training and adherence to regulations. Ensuring data security and compliance remains crucial.

Today, intelligent accounting and auditing rely on cloud technology. Cloud systems provide instant access to data and computing power, speeding up analysis and decision-making. They also constantly update information for accuracy and reliability.

Despite the rapid adoption of AI and digital technologies in accounting, their actual impact is debated. While many expect AI to improve productivity and accuracy, the effects on daily tasks are unclear. There are concerns about technological risks, data security, system reliability, and new skill requirements. It's important to understand how professionals perceive AI's role in their work.

Given these changes, this study aims to understand the practical effects of AI and digital innovation on accounting and tax practices. Although AI use is growing, it is unclear if these technologies improve accounting efficiency, affect tax management, or introduce new challenges and risks.

The main goal of this study is to examine how AI and digital innovation influence accounting and tax practices. It focuses on how professionals use digital tools and the impact on efficiency, accuracy, and decision-making.

To achieve this, the study examines several issues: current AI use in business, future developments, risks and constraints, and whether AI improves efficiency and decision-making in accounting and tax management.

2. PRESENTATION OF PREVIOUS STUDIES

Digital transformation has become a critical trend in modern business practices. Companies are increasingly using digital technologies to improve business efficiency, manage significant volumes of data, and simplify management decision-making. These innovative technological advances have also substantially affected the finance and accounting functions within organizations. Historically, accounting processes were primarily manual, needing considerable time for data entry, transaction processing, and financial reporting. However, the advent of digital systems has gradually changed the methods used to collect, process, and analyze financial information.

Digital transformation in finance and accounting is often associated with the implementation of automated information systems, cloud technologies, and cutting-edge data analytics. Modern accounting systems enable organizations to collect, store, and process financial data digitally, thereby enhancing transparency and accuracy in financial reporting. These systems support many accounting activities, including financial reporting, auditing, and tax management, and allow organizations to access financial information more quickly and efficiently.

One key element of the digital transformation of accounting is the automation of financial processes. Automation technologies enable organizations to reduce the manual work required for routine accounting tasks. For example, many companies now use automated systems for transaction processing, invoice management, and financial reporting. Automation not only increases the speed of accounting operations but also reduces human error and improves the reliability of financial information. According to a study on digital transformation in corporate finance, cloud-based

financial systems can significantly improve business efficiency by providing real-time access to financial data and enhancing collaboration between finance departments (A. Dmitrenko, L. Anastasia, 2024).

Another important aspect of the digital transformation of accounting is the development of enterprise resource planning (ERP) systems. ERP platforms integrate various business processes into a single digital environment, including accounting, purchasing, inventory management, and financial planning. Through integrating these functions, ERP systems allow organizations to more effectively manage financial information and create a unified database for financial analysis and reporting. Modern ERP solutions increasingly leverage cutting-edge technologies such as artificial intelligence plus machine learning to support predictive analytics and automated financial analysis.

Cloud accounting systems have also become an important component of digital transformation in the financial sector. Cloud accounting platforms allow companies to store financial data on remote servers and access it through online systems. This approach offers several advantages over traditional local systems, including lower infrastructure costs, greater data availability, and greater flexibility in financial management. Cloud solutions also enable real-time collaboration among accounting departments, auditors, and managers, thereby improving the overall quality of financial decision-making (Y Popivniak, 2025).

Large professional services organizations and consulting firms are stressing the importance of digital transformation in accounting and financial management. For example, global consulting firms such as Deloitte and PWC emphasize that digital technologies, including data analytics, artificial intelligence, and cloud computing, are progressively influencing the future of accounting and financial advisory services. These organizations are actively developing digital tools and advisory services that help companies modernize their financial systems and improve the efficiency of accounting processes.

Recent industry research also shows that companies worldwide are investing significantly in artificial intelligence and digital technologies. According to a global study by McKinsey & Company, the vast majority of organizations already use artificial intelligence in at least one business function, and many plan to increase their investment in AI technologies in the coming years. However, many companies are still in the early stages of integrating AI into their business processes, suggesting that the complete potential of these technologies has not yet been realized (McKinsey & Company, 2025).

Digital transformation is changing the accounting profession and the way financial information is managed in modern organizations. Automation, cloud computing, and integrated digital systems enable companies to process financial data more efficiently and make better decisions. At the same time, these technological changes create new challenges for accounting professionals, who must adapt to digital tools and develop additional technological skills. As digital innovation continues to advance, accounting and financial management are expected to become increasingly data- and technology-driven.

Artificial intelligence is increasingly being used in accounting to improve productivity and aid data analysis. One of the key technologies underpinning these changes is machine learning, which enables systems to analyze large volumes of financial data and automatically discover patterns. According to Davenport and Ronanka (2018), machine learning systems can process financial information much faster than standard methods and help organizations automate many routine tasks.

One of the most prominent applications of artificial intelligence in accounting is automating accounting processes. Many modern accounting platforms can automatically classify transactions, process invoices, and prepare financial statements. As Sutton, Holt, and Arnold (2016) note, the use of AI-based accounting systems helps reduce manual work and allows accountants to focus more on analytical tasks rather than routine data entry.

Artificial intelligence is also widely used for fraud detection and financial risk analysis. AI systems can analyze transaction trends and identify unusual financial transactions that may indicate fraud or accounting irregularities. According to Kokina and Davenport (2017), machine learning algorithms are especially effective at detecting anomalies in financial data, as they can analyze large volumes of data and recognize complex patterns that may be undetectable through manual analysis.

Another important application of AI in accounting is predictive analytics. AI systems can forecast revenue, costs, and financial risks through analyzing historical financial data. This allows companies to improve financial planning and make more informed management decisions.

Artificial intelligence technologies are already used in several contemporary accounting solutions. To support financial analysis and automate accounting procedures, SAP, for instance, incorporates artificial intelligence techniques into its enterprise resource planning systems. Similarly, artificial intelligence technologies are used by cloud accounting systems such as Xero and QuickBooks to automate financial reporting and transaction classification. Additionally, Microsoft launched Microsoft Copilot for Finance, which automates information analysis and reporting and integrates artificial intelligence into financial management processes (Microsoft, 2023).

Artificial intelligence is steadily gaining importance as a tool for tax accounting and compliance. The use of digital technologies is beneficial for tax systems, as they are often complex and require processing significant volumes of financial data. Many tax-related processes can be automated using AI-based solutions, thereby improving calculation accuracy and enabling more effective monitoring of tax liabilities.

Automated tax return verification is one useful application of AI in tax accounting. Modern digital systems can detect any errors or missing data by comparing financial data with tax requirements. This reduces the likelihood of errors in business tax returns. As a result, businesses may improve their compliance with tax laws and avoid penalties associated with inaccurate reporting.

AI is also increasingly being used in tax risk analysis. AI systems can analyze large volumes of accounting data and identify atypical transactions or patterns that may indicate potential tax risks. These tools enable companies to detect potential tax compliance issues early and take corrective measures before filing tax returns. Thus, artificial intelligence helps organizations strengthen internal control over tax processes.

Another important area of application of artificial intelligence is the automation of VAT calculations and tax reporting procedures. Many modern accounting systems automatically calculate value-added tax based on registered transactions and generate tax reports required by regulatory authorities. This significantly reduces the time required to prepare tax documents and reduces the likelihood of manual calculation errors. According to several industry reports, the automation of tax processes has become a key element of the digital transformation of financial management.

Artificial intelligence is used not only by companies but also by tax authorities. In many countries, tax authorities apply advanced data analytics software to monitor tax compliance and spot suspicious financial activity. AI technologies help tax authorities analyze large volumes of financial and transactional data and spot potential tax evasion or reporting irregularities more effectively. As a result, tax authorities can improve the effectiveness of tax enforcement and reduce tax fraud.

While artificial intelligence offers numerous benefits in accounting and financial management, its implementation also poses several obstacles and constraints. While AI systems can automate regular tasks and improve data analysis, they are not completely foolproof. Researchers and experts increasingly emphasize that the use of AI in accounting must be balanced with careful monitoring and professional judgment.

Algorithmic errors are among the main concerns with the use of artificial intelligence in accounting. AI systems evaluate financial data and provide forecasts using algorithms and training data. An algorithm can produce erroneous results if the data used to train the system is biased or incomplete. Alruwaili and Mgammal (2025) argue that while artificial intelligence can greatly improve the efficiency of accounting procedures, system architecture and data quality still determine the reliability of algorithmic decisions. For this reason, accounting professionals must continue to examine the results of automation and ensure the precision of financial information and its conformity with regulatory requirements.

Another important issue concerns data privacy. Accounting systems contain sensitive financial information related to companies, employees, and clients. Using digital services and AI applications often requires storing and processing large volumes of financial data, underscoring the importance of robust data protection. According to Bhattacharya and Sharma (2020), the growing adoption of artificial intelligence in accounting and auditing systems elicits concerns about cybersecurity issues and the safeguarding of sensitive financial data. Therefore, companies must implement strict security procedures when integrating AI technologies into financial management. Another drawback is the growing dependence on digital technology. Professionals risk becoming

overly dependent on technology as firms increasingly rely on automated accounting systems. Organizations might have difficulty maintaining correct financial records in the event of system failures, technical problems, or inaccurate data. A.T. Adegbayibi and M.K. Ajape (2025) argue that to maintain the openness and dependability of financial reporting, businesses need to establish appropriate oversight and control mechanisms in light of the growing use of AI-based financial systems.

Finally, accountants and other financial professionals must acquire new professional skills to integrate AI into accounting. Traditional accounting education focused on financial regulations, reporting requirements, and audit processes. However, knowledge of digital technologies, data analysis, and automated systems is becoming increasingly important for today's accounting professionals. According to Alruwaili and Mgammal (2025), the increasing use of artificial intelligence in accounting is changing the professional skills required in the industry, making technology knowledge and computer literacy important for aspiring accountants.

3. METHODOLOGY

This research primarily pursues a qualitative approach, as the purpose is not to elaborate on statistical relationships but to better understand how AI and digital technologies are used in bookkeeping and tax practice, and how professionals perceive their impact. The qualitative approach allows the researcher and reader to focus on professional experience, opinions, and practical observations related to the use of artificial intelligence in financial work.

The first method used in this study is a survey among accounting professionals. The survey was designed to collect information about how artificial intelligence and digital tools are used in everyday accounting and tax activities. It also helped to understand how professionals evaluate the advantages and possible problems associated with the introduction of artificial intelligence technologies into their work. The investigation paper presents a survey of real-world applications of AI in accounting systems, in addition to the investigation. To understand how artificial intelligence is employed in actual corporate settings, examples from popular digital accounting platforms and financial management applications were examined. This method makes it easier to connect theoretical debates about AI to actual applications in financial procedures.

Table 1. Set of survey questions utilized in the investigation.

	Question
1	What is your current professional position?
2	How many years of experience do you have in accounting, finance, or taxation?
3	Does your organization use artificial intelligence or digital tools in accounting or tax processes?
4	What types of digital or AI-based tools are used in your work?
5	How often do you use these technologies in your daily work?

6	In your opinion, has the use of AI improved efficiency in accounting tasks?
7	Does artificial intelligence help improve the accuracy of financial or tax reporting?
8	What advantages do you see in the use of AI in accounting or tax practice?
9	What risks or challenges do you associate with the use of AI technologies?
10	How do you think AI will influence the future role of accountants and tax specialists?

The research study also used comparative information gathered from survey responses and practical examples, which were compared with the results presented in the existing scientific literature on artificial intelligence in accounting and financial management. This comparison enables the identification of similarities and differences between the conceptual expectations and the actual experiences of accounting professionals. Also, to better understand the function of artificial intelligence in modern accounting and tax practice by integrating various approaches. A qualitative research methodology allows the researcher to focus on professional opinions and useful findings rather than solely on quantitative analysis.

Data for this study were collected through a survey of professionals in accounting, finance, and taxation. The main objective of the survey was to understand how artificial intelligence and digital technologies are currently used in accounting and tax practice, and how experts evaluate their impact on their daily work. Experts from various professional fields participated in the survey to gain a greater understanding of the use of digital tools in financial activities. Respondents were asked about their professional experience, their use of AI-based systems, and their opinions on the benefits and possible challenges of implementing AI in accounting and tax processes.

For the purposes of this research, 50 respondents from Tax & Legal departments at a Big 4 Company contributed their experience and professional knowledge. The participants represented several professional groups, including experienced consultants, senior consultants, assistant managers, and managers. This allowed the investigation to be diverse and took into account various areas of responsibility. An online survey was used for this study. Respondents were asked a series of questions about the use of digital technologies and artificial intelligence in accounting and taxation. The questions included both closed-ended and open-ended responses. Open-ended responses provided more insight into professionals' actual experiences, while closed-ended questions enabled the researcher to identify general trends.

Table 2. Survey respondents

Position	**Count**
Assistant Manager	17
Experienced Consultant	12
Senior Consultant	11

Manager	10

Table 3. Years of experience of survey respondents

Years of Experience	**Count**
12+ years	15
8-12 years	11
1-3 years	10
3-5 years	8
5-8 years	6

The collected information was then systematized and examined to identify recurring trends in the use of artificial intelligence in accounting and tax procedures. The answers also helped to identify the apparent benefits of AI technologies, as well as the difficulties of their practical application. Survey respondents included professionals working in various fields of accounting and financial management. Respondents also had varying levels of professional experience. This helped create a more balanced picture of how professionals at different career stages perceive digital technologies. Some participants had years of experience in accounting, while others had been in the field for longer. Overall, respondents represent professionals directly involved in accounting and taxation. Therefore, their responses provide useful insights into how artificial intelligence and digital tools are currently used in practice. The purpose of the survey conducted in this study was to collect data on the use of digital technologies and artificial intelligence in accounting and tax procedures. To better understand the experiences of accounting and finance professionals, the questions were formulated in simple, understandable terms. Respondents were able to express their thoughts and real-life observations through both closed- and open-ended questions.

A qualitative method was used to examine the collected data. The goal of the analysis was to gain a more profound understanding of how accounting professionals perceive the use of digital technologies and artificial intelligence in their work. The study focused on identifying common beliefs, experiences, and patterns in participants' responses, rather than relying on elaborate statistical calculations. The collected data were organized and interpreted using thematic analysis. This method allows researchers to detect recurring concepts and themes in qualitative data. The survey results were carefully examined and grouped by themes related to the application of AI in accounting and taxation. During the analysis, special attention was paid to identifying key themes that emerged from the responses. These themes included the current use of AI technologies in accounting, the apparent benefits of AI systems, and the challenges associated with their

implementation. Grouping responses into these categories facilitated a better understanding of the professionals' overall attitudes toward digital transformation in accounting and taxation. Furthermore, the interpretation of the responses played a key role in the analysis. Open-ended responses provided important insights into the experiences of accounting professionals and illustrated the application of artificial intelligence in real-world professional scenarios. By interpreting these responses, study participants identified common ground and differences of opinion regarding the impact of artificial intelligence on accounting and tax practices.

4. RESULTS

According to the survey results, most professionals currently use digital tools or artificial intelligence in their daily work. Respondents noted that AI technologies are most often used in typical bookkeeping procedures, including tax reporting, financial data analysis, and accounting automation. According to respondents, automated accounting is the most popular application of artificial intelligence. Many participants noted how common tasks, such as transaction classification and financial reporting, can be automated using digital accounting systems. This allows accountants to focus on analytical tasks and limit manual labor. Respondents' input on whether AI improved the effectiveness and accuracy of the work:

Table 4. Advantages noticed by respondents who took part in the study

Advantages of AI	**Count**
Faster data processing	12
Automation of repetitive tax tasks	11
Time savings in reporting	10
Reduced human error	7
Improved accuracy in bookkeeping	5
Better financial insights	5

Table 5. Risks/Challenges noticed by respondents who took part in the study

Risks/Challenges	Count
Over-reliance on automation	10
High implementation costs	9
Lack of understanding of AI outputs	8
Job displacement concerns	8
System errors or bugs	8
Data security concerns	7

Table 4. Future impact of AI based on the knowledge of respondents who took part in the study

Future Impact of AI	Count
Integration of AI in all tax processes	18
Automation of routine bookkeeping	13
Higher demand for digital skills	7
Shift towards advisory roles	6
More strategic role for accountants	6

Financial analysis tools are also widely used by accounting professionals. Around 40% of respondents reported using AI-based systems to examine financial data and generate reports. These tools help organizations process large volumes of financial information and make more effective management decisions. Another important area of AI application is tax compliance. More than half of respondents indicated that their organizations use digital systems to support tax calculation and reporting processes. These technologies help improve tax reporting accuracy and reduce the risk of calculation errors. The survey results also revealed several significant benefits that accountants believe arise from using digital technologies and artificial intelligence in their work. Most respondents stated that AI technologies improve the overall efficiency of financial functions through streamlining standard accounting procedures. Participants cited time savings, reduced manual labor, improved financial data quality, and faster financial reporting as key benefits.

As can be seen, the most frequently cited benefit is time savings. Several respondents believe that digital accounting systems enable them to perform routine tasks more quickly, particularly transaction classification, invoice processing, and report generation. Accountants can focus more

on analytical work and spend less time on repetitive tasks through automating these operations. Another important benefit is reduced manual work. Most respondents reported that artificial intelligence tools help reduce the necessity of manual data entry and repetitive accounting tasks. Automation systems can automatically process financial transactions and classify them within accounting, greatly simplifying day-to-day accounting operations. Respondents also emphasized the role of artificial intelligence in improving the accuracy of fiscal data. Automated systems reduce the risk of human error in manual calculations or data entry. As a result, organizations can produce more reliable financial statements and better comply with accounting standards and tax laws.

Finally, many experts note that artificial intelligence helps speed up the preparation of financial reports. Digital accounting platforms can automatically generate financial and analytical reports from existing financial data. This allows organizations to access up-to-date financial information and make management decisions faster. Furthermore, real-world examples from modern accounting systems support these arguments. Automated technologies that assist with transaction processing, financial reporting, and data analysis are used in many popular accounting platforms, including SAP financial systems. Furthermore, new tools such as Microsoft Copilot for ChatGPT and Claude improve reporting and automate financial data processing. These examples show how artificial intelligence is gradually becoming a critical instrument in modern accounting.

Artificial intelligence is also being used in tax accounting and tax reporting. Survey results show that many companies are already using digital tools to calculate taxes and verify financial data. These technologies help accountants work faster and reduce the risk of errors in tax reporting. One common application of artificial intelligence in tax accounting is the automated verification of tax data. Many modern accounting systems can compare financial transactions against tax regulations to identify probable errors and missing information. This helps accountants verify tax data before submitting reports to the tax authorities. Reducing the number of tax errors is another important advantage of preparing tax reports manually, as data entry or calculation errors can sometimes occur. Because AI-based systems automatically process financial data and apply tax requirements, they help reduce these risks. This increases the accuracy of tax returns. Firms can forecast future tax liabilities using artificial intelligence. Digital systems can calculate a business's potential future tax liability by analyzing historical financial data. This makes it easier for businesses to budget and prepare for taxes. More than half of respondents stated that digital technologies are used to verify tax-related data, as shown in the table. Many participants also mentioned how artificial intelligence technologies help reduce errors when filing tax returns. Furthermore, several respondents mentioned that future tax payments are estimated using computer technology. While artificial intelligence offers many benefits in accounting and tax, it likewise presents a number of challenges. The survey results show that professionals are generally positive about digital technologies but also acknowledge the potential risks associated with AI systems. One concern mentioned by respondents is the possibility of technical errors. Although AI systems can automate many processes, they still rely on software and data quality. Even if the system is

configured correctly and the correct data is entered, errors can still appear in financial statements. For this reason, accountants must analyze and monitor the results generated by automated systems. Another concern is the cost of implementation. Implementing artificial intelligence technologies and digital accounting systems can make major financial investments. Companies often need to purchase new software, upgrade their IT infrastructure, and maintain digital systems. For smaller organizations, these costs can sometimes be a barrier to adopting advanced technologies. Respondents also noted the importance of training and professional development. When companies implement new digital tools, employees need time to learn how to use them correctly. Some accountants may lack strong technological skills, making the transition to AI-based systems challenging. As a result, organizations may need to invest in additional employee training. Another important issue is data privacy and security. Accounting systems contain sensitive financial information, including company data, transactions, and tax reports. When using digital internet platforms and systems, protecting this information becomes critical. Companies must ensure that security measures are in place to prevent data leakage or unauthorized access. The survey results generally support the ideas discussed in the literature on the use of artificial intelligence in accounting. Many respondents in this study stated that AI helps conserve time and reduce labor in accounting processes. These outcomes are consistent with those reported by Bhattacharya and Sharma (2020), who note that artificial intelligence enables organizations to automate routine accounting tasks and improve efficiency. Another important finding of the survey was that many respondents believed that artificial intelligence improves the accuracy of financial data and reporting. Human error in data entry, automated methods lower processing costs. Alruwaili and Mgammal (2025), who argue that AI technologies can enable more accurate accounting methods and improve the quality of financial information, reached similar conclusions.

The study's findings also indicate that financial analysis and decision-making are beginning to benefit from AI. Several respondents believe digital technologies help them to process financial data and produce reports more quickly. Bhattacharya and Sharma (2020) argue that AI-based technologies help businesses analyze financial data effectively and make more informed management decisions. At the same time, survey participants also identified several risks associated with the use of AI in accounting. Some respondents pointed to potential technical errors, data confidentiality concerns, and the need for additional training. These issues are also discussed in the academic literature. While AI technologies can improve economic transparency and data analysis, organizations have to ensure adequate data controls and protection when using digital systems.

5. CONCLUSION

The use of AI frees bookkeeping professionals from time-consuming, repetitive tasks, enabling them to concentrate on more important strategic matters. Many procedures are automated by AI, which also improves financial data security, helps prevent cyberattacks, and ensures more

accurate reporting. As a result, companies become stronger. A paper examines how artificial intelligence and digital technologies are impacting accounting and tax practice. The main objective of the study was to understand how accounting and finance professionals use AI tools in their work and how they assess the benefits and possible risks of these technologies.

The study results show that artificial intelligence is gradually becoming an important instrument in modern accounting. Many respondents reported that digital systems help automate regular tasks, such as transaction processing, financial reporting, and data analysis. This allows accountants to spend less time on manual work and focus more on analyzing financial information and supporting business decisions. AI is gradually becoming an important instrument in modern accounting. Another important finding of the study is that artificial intelligence can improve the efficiency of accounting processes. Many experts note that AI tools help them complete tasks faster and organize financial information more effectively, enabling faster processing of financial data, helping companies prepare reports more quickly. AI can improve the accuracy and precision of financial reporting. Automated systems reduce the risk of errors that can occur during manual calculations or data entry. When used correctly, digital tools help companies maintain more reliable financials and improve compliance with accounting and tax regulations.

Tax accounting is another area where artificial intelligence has demonstrated effectiveness. According to the study, many businesses are using digital technology to simplify and streamline tax reporting, reduce calculation errors, and validate. Through analyzing financial data from previous periods, some systems can also help businesses estimate their future tax liabilities. This allows businesses to better manage their financial affairs and prepare for upcoming tax payments. At the same time, the study shows that the use of artificial intelligence faces challenges. Some respondents voiced concerns about technical challenges, the cost of implementing digital systems, and the need for additional training. There are also concerns related to data security and the safeguarding of sensitive financial information. These issues demonstrate that, although AI technologies offer many benefits, organizations should implement them with caution. From a practical perspective, companies should implement AI gradually and ensure employees understand how to use new technologies effectively. Accountants also need to develop digital capabilities to effectively work with modern accounting systems. As financial technologies evolve, the role of accountants will likely change, with them focusing more on analysis, interpretation of financial data, and strategic management.

This study also has several limitations. A relatively small number of respondents participated in the survey, meaning the results may not reflect the views of all accounting professionals. However, the results still provide useful information about how AI technologies are currently being used in accounting and tax. Subsequent research couldarch could expand on this by analyzing a broader sample of professionals and including organizations from different industries or countries. Furthermore, future studies could apply quantitative research methods to more accurately assess the impact of financial indicators, performance, and operational output. AI in accounting and auditing undoubtedly improves the exactness and performance of processes, reduces routine labor

costs, and offers a number of other benefits. However, it is important to consider the existing risks and threats.

6. RECOMMENDATIONS

In light of these findings, a series of recommendations are proposed to promote the ethical, effective, and sustainable adoption of AI in accounting, auditing, and taxation. These recommendations address key areas such as regulatory policy, workforce reskilling, technological innovation, and ethical considerations, ensuring that AI-driven transformation is consistent with the broader goals of financial integrity and professional excellence.

Establishing a robust governance and regulatory framework for AI

A critical priority is the development of clear and enforceable AI regulations tailored to the financial sector.

Policymakers should work with accounting standard setters, audit firms, and technology experts to establish guidelines governing transparency, accountability, and data security in the field of AI (Belahouaoui & Attak, 2024). These frameworks should address issues such as AI bias, algorithmic decision-making, and audit reliability, ensuring that AI applications comply with ethical and professional standards (Schweitzer, 2024). Furthermore, governments should create regulatory sandboxes where firms can test AI-based solutions in controlled settings, fostering innovation while ensuring compliance with financial regulations (Wang, 2024).

Invest in workforce reskilling and digital literacy programs

Automation of accounting and auditing tasks requires a paradigm shift in the skills needed for future accountants. Educational institutions and professional organizations should integrate AI, data analytics, blockchain, and 541 International Journal of Science and Research, 2025, 14(03), 531-544

cybersecurity into accounting curricula to prepare graduates for the digital age (Labbe, 2024). Furthermore, continuing professional development (CPD) programs should be mandatory to enhance the skills of existing accountants, ensuring their competitiveness in an AI-driven profession (Zhang et al., 2020). Accounting firms should also implement AI training, workshops, online courses, and certification programs to enable professionals to gain hands-on experience with AI-based financial tools (Peng et al., 2023).

Enhancing AI Ethics and Responsible Use of AI in Accounting

As AI becomes increasingly integrated into financial decision-making, ethical considerations must remain at the forefront of AI implementation.

Organizations should implement AI-related ethical policies that emphasize fairness, transparency, and accountability in AI-driven financial transactions (Munoko, Brown-Liburd, & Vasarhelyi, 2020). To mitigate the risks associated with AI bias, discriminatory algorithms, and data misuse, firms should conduct regular AI audits and bias assessments, ensuring that financial reports generated using AI maintain integrity and objectivity (Rahman et al., 2024). Furthermore,

regulators should establish AI ethics committees to oversee the application of AI in accounting and tax law, providing guidance on the responsible governance of AI (Schweitzer, 2024).

Using AI for proactive fraud detection and risk management

Given the increasing sophistication of financial fraud, AI should be used to enhance fraud detection capabilities in auditing and financial reporting. Auditors should use machine learning-based anomaly detection systems to identify fraudulent transactions, financial misstatements, and compliance violations in real time (Hasan, 2021). AI-based predictive analytics can also help companies assess financial risks and take proactive measures to prevent fraudulent activities (Greenman et al., 2024). To maximize the potential of AI in fraud detection, collaboration between regulators, financial institutions, and AI researchers in developing advanced fraud prevention models is crucial (Han et al., 2023)

Promoting Collaboration between Academia, Industry, and Regulators

To ensure that AI implementation in accounting aligns with best practices, closer collaboration is needed between academic researchers, industrial practitioners, and financial regulators (Wang, 2024). Universities should collaborate with accounting firms and AI developers to conduct applied research, exploring innovative AI-based financial solutions (Labbe, 2024). Industry professionals should also contribute to policy discussions and AI governance initiatives, ensuring they are practical and adaptable.

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Determinants of Profitability in the Mining Industry of Central Asia and Caucasus: The Role of Firm-Specific, Macroeconomic, and ESG Factors

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Abstract

This study aims to explore the determinants of profitability in the mining industry of Central Asia and the Caucasus by focusing on firm-specific, macroeconomic, and ESG (Environmental, Social, and Governance) factors. Using an unbalanced panel data of 15 mining companies based in Kazakhstan, Azerbaijan, Armenia, and Uzbekistan for the period 2010–2024, the analysis applies a fixed-effects model with Driscoll–Kraay corrections to assess the influence of variables such as firm size, leverage, liquidity, gross profit margin (GPM), GDP growth, inflation, commodity price changes, and ESG indicators on Return on Assets (ROA). The results show that operational efficiency, measured through GPM, strongly enhances profitability, while leverage exerts a negative impact. GDP growth and increases in commodity prices significantly improve ROA, reflecting the sector's sensitivity to economic conditions and global market cycles. Environmental intensity is found to reduce profitability, whereas the social pillar and the composite ESG score display positive, albeit modest, effects. Inflation and governance quality exhibit weak relationships with performance. The study provides new empirical evidence for a region with limited prior research and underscores the importance of efficiency, capital structure, market conditions, and sustainability practices in shaping financial outcomes in the Central Asian and Caucasus mining sector.

KEYWORDS: ROA, GPM, liquidity, leverage, ESG, Central Asia, Caucasus

1. Introduction

Mining is a core economic sector in Central Asia and the Caucasus, where mineral exports constitutes a significant share of national income. In Kazakhstan, the mining sector excluding oil and gas accounted for 12.1 percent of national Gross Domestic Product (GDP) in 2024, equivalent and contributed roughly one-third of total export value (AIFC, 2024). According to respective country statistical reports, mining in other countries of the region ranged between 2-9 percent in terms of the contribution to GDP. These figures highlight the sector's importance and the need to understand what drives its financial performance. Recently, Central Asia started to be recognized

as a strategic source of minerals, particularly for critical raw materials and rare-earth elements, for its substantial reserves in lithium, uranium and other inputs which are essential for the global green transition. According to the study, the region is shifting from a peripheral supplier to a central player in global mineral supply chains (The Hague Research Institute, 2024).

In standard business model, the profitability in mining is a function of macroeconomic conditions such as GDP growth, inflation, commodity prices as well as firm-specific factors such as operational efficiency and financial structure. Lately, sustainability factors including environmental performance, social conditions, and governance quality pillars are also becoming increasingly relevant for long-term financial outcomes. That being said, the empirical research for Central Asia and the Caucasus remains limited. Most studies focus on Southeast Asia or larger emerging markets. Additionally, few studies combine macroeconomic, firm-specific and ESG variables in one model. Evidence on how GPM affects ROA in mining is also scarce despite its direct link to operational efficiency. This creates a clear gap in the literature.

This study addresses these gaps by examining how firm characteristics, macroeconomic indicators, and ESG factors influence profitability in mining companies across the region. The contribution includes building a region-specific dataset, integrating a composite ESG index, and applying an estimation approach suited for panels with potential cross-sectional dependence.

The dataset covers 15 mining companies from 2010 to 2024. Firm-level data come from Capital IQ and audited financial statements, while macroeconomic and ESG indicators come from the World Bank. Commodity prices are sourced from the World Bank Global Commodity Markets, FRED, and USGS. Fixed-effects estimation with Driscoll–Kraay standard errors is used to address heteroscedasticity and potential cross-sectional dependence.

Results show that GPM increases ROA, leverage reduces profitability, and GDP growth and commodity price changes improve performance. Environmental intensity lowers ROA, while social conditions and the composite ESG score support profitability.

Section 2 reviews the literature. Section 3 presents data and methodology. Section 4 reports results. Section 5 concludes.

2. Literature Review

Profitability in the mining sector depends on internal firm characteristics, market conditions, and broader economic trends. Evidence from Indonesian mining firms shows that firm size has a positive and significant effect on ROA, consistent with economies of scale arguments that larger firms benefit from lower per-unit costs, better access to financing, and greater production capacity (Hadi and Layyinaturrobaniyah, 2022). The same study finds that liquidity also positively affects profitability, while asset structure shows no significant effect. The relationship between leverage and profitability is context-dependent: studies of Indonesian mining firms find that leverage can positively affect ROA when firms remain within an optimal debt range (Hadi and

Layyinaturrobaniyah, 2022), whereas broader evidence from European mining and energy sectors finds a negative association between leverage and profitability, consistent with capital structure theory predicting that excessive borrowing raises financial risk and erodes returns (Barburski and Hołda, 2023). Particularly in Indonesian mining companies, higher ESG risk ratings and financial leverage were both associated with lower ROA that suggests that sustainability-related risks compound the costs of debt-heavy financing structures (Marliza, 2024).

Macroeconomic factors play a significant role in shaping mining sector performance. Economic growth has a positive and significant effect on the profitability of mining companies, as expanding economic activity increases demand for mineral commodities, which in turn raises revenues and improves asset returns (Veronica and Sari, 2024). On the other hand, inflation shows a negative pressure on profitability through raising operating and input costs. That said, inflation effect may be partially offset when mining companies are able to adjust selling prices in line with rising commodity markets, which explains why its impact is sometimes statistically insignificant (Veronica and Sari, 2024). These patterns support business cycle theory, which predicts stronger performance during economic expansions and weaker results in high-inflation environments where cost pressures are harder to pass through to buyers.

Environmental and sustainability factors represent an emerging dimension of profitability analysis. Research on Chinese listed mining companies finds that climate change risks are associated with financial performance, with different types of physical and transition risks affecting firms differently depending on their resource base and adaptive capacity, though the aggregate effect of composite climate risk indices is not always statistically significant (Sun et al., 2020). Evidence from Levant countries shows that collective ESG performance which combines environmental, social, and governance dimensions, enhances financial results including ROA, and that firms with stronger stakeholder engagement and clearer sustainability disclosure tend to perform better financially (Al Amosh et al., 2023). Although the effect varies across firms and contexts, the overall evidence suggests that integrated sustainability practices help reduce risk and support long-term financial outcomes.

2.1 Theoretical Background

Agency Theory describes the relationship between principals (i.e. shareholders) and agents (i.e. managers) where misaligned interests generate agency costs that reduce firm value and profitability (Jensen and Meckling, 1976). Capital structure decisions, particularly the level of debt, serve as a disciplining mechanism on managerial behavior. Namely, higher leverage reduces the free cash flow available to managers, so it constrains hefty spending and aligns incentives more closely with shareholder interests (Fama, 1980; Fama and Jensen, 1983). When managers hold superior information about firm prospects, financing decisions also signal firm quality to outside investors, which in turn, influences the cost of capital and profitability (Myers and Majluf, 1984).

In the mining context, excessive debt raises financial risk and interest burden beyond the disciplining benefit, resulting in a negative association between leverage and ROA (Barburski and Hołda, 2023; Hidayat and Handoyo, 2024). Firms with stronger short-term liquidity positions face lower financial distress risk and greater operational flexibility, supporting higher profitability. In this study, agency theory provides the theoretical basis for including leverage (LEV), liquidity (LIQ), firm size (LN_Asset), and GPM as determinants of ROA. GPM reflects how well management controls production costs relative to revenues, which is a direct measure of operational performance from the shareholders' perspective. Firm size is included because larger firms tend to have more dispersed ownership, higher monitoring costs, and broader access to external financing, all of which affect the intensity of agency conflicts and their impact on profitability.

Stakeholder Theory suggests that any company's long-term success depends not only on generating returns for shareholders but also on managing relationships with all groups that affect or are affected by its operations, including employees, communities, governments, and the broader environment (Freeman, 1984). The governance pillar connects both theories: stakeholder theory treats governance as a way to balance competing stakeholder interests, while agency theory sees regulatory quality as an institutional constraint on managerial behavior. Both perspectives support its inclusion as a profitability determinant. A positive relationship between corporate social performance and financial outcomes has been confirmed empirically across large firm samples (Waddock and Graves, 1997), and in extractive industries specifically, the majority of studies report that social responsibility practices support financial performance (Beurden and Gössling, 2008). In emerging markets, firms with stronger ESG profiles tend to experience more stable and resilient profitability over time (Amosh et al., 2023). In this study, stakeholder theory provides the basis for including the environmental (ENV), social (SOC), and governance (GOV) pillars and the composite ESG score as determinants of profitability, reflecting the stakeholder demands that mining firms in Central Asia and the Caucasus face from governments, communities, and international investors. Because firm-level ESG data is not available for most companies in this region, country-level proxies are used instead: carbon intensity of GDP for the environmental dimension, female labor force participation for the social dimension, and regulatory quality for governance. These proxies capture the macro sustainability environment within which firms operate, and this approach is consistent with emerging market ESG research where firm-level disclosure remains limited.

Of note, macro variables were included as external conditions that shape company's performance. These variables are not derived from agency or stakeholder theory directly. However, it reflects business cycle dynamics that are well established in the corporate finance literature. Economic growth increases demand for mineral products, commodity price cycles directly affect mining revenues and margins, and inflation raises input costs that reduce profitability. Their inclusion is justified by the sector's high sensitivity to external economic conditions.

2.2 Gaps in Research

There are major gaps in this area despite consistent evidence on efficiency, leverage, macroeconomic conditions, and sustainability practices. Only few studies examine mining companies in Central Asia and the Caucasus, even though the sector is economically significant in this region. Existing research rarely combines firm level characteristics, macroeconomic variables, and ESG indicators in a single model, limiting the understanding of how these factors interact. Evidence on the link between GPM and ROA in mining firms is also limited, despite GPM being a direct measure of operational efficiency. These gaps justify a comprehensive, region specific study that integrates financial, macroeconomic, and sustainability determinants of profitability.

2.3 Hypotheses of the study

H1: Firm size has a positive relationship with ROA because larger firms benefit from economies of scale.

H2: Higher GPM increases ROA due to better operational efficiency.

H3: Leverage has a negative effect on ROA because excessive debt raises financial risk.

H4: Liquidity has a positive effect on ROA since firms with stronger short-term positions operate more flexibly.

H5: GDP growth positively affects ROA as economic expansion increases demand for mining products.

H6: Increases in commodity prices improve ROA because mining companies are price sensitive.

H7: Inflation negatively affects ROA through rising production and input costs.

H8: Higher environmental intensity (ENV) reduces ROA due to added compliance and efficiency pressures.

H9: Stronger social conditions (SOC) improve ROA because inclusive labor environments support productivity.

H10: Better governance quality (GOV) has a positive effect on ROA.

H11: The combined ESG score (ESG) has a positive impact on ROA by capturing broad sustainability performance.

H12: Time dummies (2015, 2020, 2022) capture major structural shocks affecting ROA during these years.

3. Data and Methodology

3.1 Data Description

The study uses an unbalanced panel dataset covering 15 private and public mining companies from Central Asia and Caucasus for the period 2010–2024. The sample is predominantly composed of Kazakhstani firms, with one company each from Azerbaijan, Armenia, and Uzbekistan,

reflecting the geographic concentration of large-scale mining operations in the region. Firm-specific financial variables (ROA, total assets, leverage, liquidity, and GPM) were collected from Capital IQ and audited financial statements were sourced from Financial Reporting Depository for Kazakhstani companies and official websites for the rest.

Macroeconomic and ESG-related indicators (GDP growth, inflation, carbon intensity, female labor participation, and regulatory quality) were obtained from the World Bank (WDI) database. Commodity prices (copper, gold, zinc, ferrochrome, and other relevant metals depending on the firm's primary output) were compiled from multiple reputable sources: the World Bank Global Commodity Markets database, the Federal Reserve Economic Data (FRED), and United States Geological Survey & Mineral Commodity Summaries (USGS MCS, 2015 edition) for historical ferrochrome pricing.

3.2 Variable Definitions

Table 1. Summary of variables

Variable name	Abbreviation	Definition / Measurement	Expected relationship
Dependent variable			
Profitability	ROA	Net income divided by average total assets. A commonly used accounting measure of financial performance	
Independent firm-specific variables			
Firm size	LN_Asset	Natural logarithm of total assets	± (mixed findings)
Operational efficiency	GPM	Gross profit divided by revenue	+
Leverage	LEV	Total interest-bearing debt divided by total equity	−
Liquidity	LIQ	Current assets divided by current liabilities	+
Independent macroeconomic and ESG variables			
GDP Growth	GDPG	Annual GDP growth rate (%), proxy for macroeconomic activity (World Bank, 2024)	+
Commodity price	dComPrice	First difference of the commodity price index (World Bank Commodities, November 2025).	+

Inflation rate	INFL	Annual inflation rate (percent) (World Bank WDI, 2024).	−
Environmental sustainability	ENV	Carbon intensity of GDP, kg CO_2 equivalent per USD of GDP (World Bank WDI, 2024).	−
Social pillar	SOC	Female labor participation rate (percent) (World Bank WDI, 2024).	+
Governance pillar	GOV	Regulatory quality (percentile rank) (World Bank WDI, 2024).	+
		Composite index	
ESG composite score	ESG	Standardized index derived from ENV, SOC, GOV using z-score normalization (Author's calculation).	+
		Control variables	
Year dummies	Y2015 / Y2020 / Y2022	Dummy = 1 for respective years; 0 otherwise. Captures structural influences including market shocks (Author's coding).	±

Source: Author's own work

Dependent Variable: ROA is measured as net income divided by average total assets, indicating how efficiently a firm generates profit from its asset base. Since net income is an income-statement item accumulated over the year and total assets are a point-in-time balance sheet value, the average of total assets at t and t-1 was used to ensure consistency in measurement.

Independent firm-specific variables:

Firm size: Natural logarithm of total assets was used to control scale differences among firms. Larger firms are expected to benefit from economies of scale.

Operational efficiency: Ratio of gross profit to revenue, measuring the firm's ability to control production and operating costs relative to sales.

Leverage: Total debt divided by total equity, reflecting the extent to which the firm finances its operations through debt rather than equity.

Liquidity: Ratio of current assets to current liabilities, showing a firm's ability to meet short-term obligations.

Independent macroeconomic and ESG variables:

GDP Growth (GDPG): Economic growth can be defined as an increase or improvement in the inflation-adjusted market value of the goods and services produced by an economy in a financial year. The annual GDP growth was used.

Commodity Price: Annual change in global commodity prices relevant to the primary output of mining companies (e.g., copper, gold, ferrochrome). In case of one company, the output is diversified into three distinct commodities. As such, simple average index was used.

Inflation rate: Annual consumer price index (CPI), indicating the change in purchasing power and cost pressures faced by firms.

Environmental sustainability: This indicator reflects environmental impact and is measured by annual CO2 emissions per capita.

Social pillar: Female labor force as a percentage of the total labor force shows the extent to which women are active in the labor force. Labor force comprises people ages 15 and older who supply labor (World Bank definition).

Governance pillar: Measures effectiveness of governance and regulatory stability. World Bank's Regulatory Quality Index was used as a proxy, and it is defined as the ability of the government to formulate and implement sound policies and regulations. The regulatory environment is particularly relevant for the banking sector.

Composite ESG variable: Firm-level ESG disclosure is available only for a small subset of companies and only for the most recent 3 to 4 years. Therefore, macro-level ESG indicators (ENV, SOC, GOV) were used as proxies to reflect each country's macro sustainability environment. A unified sustainability variable calculated by standardizing each ESG pillar (ENV, SOC, GOV) to control for differences in scale and measurement units (z-score transformation), and then averaging them: "ESG = (z (ENV)+z(SOC)+z(GOV)) / 3".

Time dummies for 2015, 2020 and 2022: Dummy variables capture year-specific macro shocks: 2015 reflects the sharp devaluation of KZT/USD when National Bank of Kazakhstan transitioned to a free-floating exchange, 2020 reflects COVID-19 impact, and 2022 captures the year of heightened political turmoil in the region affecting the mining sector in a whole.

3.3 Econometric Model

The rationale for choosing the Central Asia and Caucasus as well as mining sector is two-fold. Firstly, there are limited papers on Central Asia and Caucasus in mining sector as most researchers focus on Southeast Asia, or other emerging economies in general, which may not reflect the dynamics of this region. Secondly, mining sector in each of the economies contributes to meaningful percentage of GDP and export value. Of note, although the research focuses on Central Asia and Caucasus, the data set only includes mining companies from 4 countries and excludes countries such as Kyrgyzstan, Tajikistan, Georgia, and Turkmenistan. The main reason for this is that such countries lack mining companies with readily available financial statements.

In terms of the process, firstly, the data is converted to panel data for further analysis. The data is analyzed using Stata software. Secondly, descriptive statistics are performed to learn the attributes of the data. Multicollinearity, autocorrelation, and heteroscedasticity tests are performed to check whether the data can be relied upon. The Driscoll–Kraay model was then employed to run the regression to account for heteroscedasticity and potential Cross-Sectional Dependence issues.

The regression model is as follows:

$$Y = \beta 0 + \beta 1(LN\_Asset) + \beta 2(GPM) + \beta 3(LEV) + \beta 4(LIQ) + \beta 5(GDPG) + \beta 6(dComPrice) + \beta 7(INFL) + \beta 8(ENV) + \beta 9(SOC) + \beta 10(GOV) + \beta 11(ESG) + \beta 12(Y2015) + \beta 13(Y2020) + \beta 14(Y2022) + \epsilon$$

Here Y represents the dependent variable (ROA), β represents the coefficients, β0 and ε represent the constant and the error term, respectively.

4. Results and Discussion

This section presents the empirical findings obtained from the panel data analysis. The results are organized in four sub-sections: (i) descriptive statistics; (ii) correlation matrix; (iii) the diagnostic tests ensuring the validity of the data and model assumptions; (iv) the estimation results based on the Driscoll–Kraay approach; and (v) a brief interpretation of the robustness and methodological implications of the results.

4.1 Descriptive statistics

The descriptive statistics summarize the main characteristics of the dataset. ROA has an average value of 0.077% with a wide variation that reflects differences in scale, operations and profitability across firms. The firms also differ considerably in size, leverage, liquidity and operational efficiency. Commodity prices and macroeconomic indicators show meaningful variation over time, reflecting changes in regional economic conditions and global metal markets. ESG variables also vary from year to year due to shifts in environmental performance, labor participation and regulatory quality.

Table 2. Model summary

Variable	Obs	Mean	Std. Dev.	Min	Max
ROA	189	0.077	0.183	-0.443	1.467
LN_Asset	189	7.11	3.132	-0.022	15.672
GPM	162	0.423	0.169	-0.027	0.817
LEV	177	17.881	157.019	0	1829.874
LIQ	189	2.279	2.165	0.073	16.418
GDPG	225	4.034	2.721	-7.2	12.6
dComPrice	210	2.665	27.863	-132.556	154.563
INFL	223	8.181	3.698	-1.404	17.524

ENV	210	1.196	0.342	0.498	2.227
SOC	225	64.418	7.153	39.097	68.035
GOV	210	47.893	12.594	2.844	64.286
ESG	210	0.004	0.642	-2.255	0.546
Y2015	225	0.067	0.25	0	1
Y2020	225	0.067	0.25	0	1
Y2022	225	0.067	0.25	0	1

4.2 Correlation Matrix

The correlation matrix shows that ROA is most positively correlated with GPM, indicating that firms with stronger operational efficiency tend to achieve higher profitability. The strongest negative correlation with ROA appears for leverage (LEV), suggesting that firms with higher debt levels generally earn lower returns. Overall, correlations across variables remain moderate, meaning multicollinearity is unlikely to distort the regression results.

Table 3. Correlation table

Var.	ROA	LN_Asset	GPM	LEV	LIQ	GDPG	dCom Price	INFL	ENV	SOC	GOV	ESG	Y2015	Y2020	Y2022
ROA	1														
LN_Asset	(0.111)	1													
GPM	0.452	(0.126)	1												
LEV	(0.177)	(0.104)	0.016	1											
LIQ	0.131	0.160	0.096	(0.090)	1										
GDPG	0.010	0.043	0.116	0.026	0.070	1									
dCom Price	0.466	(0.009)	0.250	(0.088)	0.047	(0.044)	1								
INFL	0.124	0.082	0.072	(0.068)	0.026	(0.003)	0.059	1							
ENV	(0.020)	0.160	0.058	(0.031)	0.128	0.285	(0.013)	0.078	1						
SOC	0.025	0.046	(0.123)	0.043	0.181	(0.094)	(0.043)	0.065	0.405	1					

GOV	0.146	0.028	0.077	0.105	0.055	(0.067)	0.079	(0.089)	(0.316)	0.412	1				
ESG	0.067	0.124	0.006	0.052	0.185	0.081	0.007	0.035	0.611	0.904	0.479	1			
Y2015	(0.080)	(0.007)	(0.250)	(0.021)	(0.085)	(0.207)	(0.117)	(0.125)	(0.062)	0.074	(0.069)	(0.029)	1		
Y2020	0.044	0.025	0.112	(0.027)	(0.009)	(0.681)	0.049	(0.148)	(0.118)	(0.126)	0.040	(0.109)	(0.078)	1	
Y2022	0.209	(0.010)	0.090	(0.033)	(0.059)	0.076	0.263	0.498	(0.129)	(0.102)	0.006	(0.119)	(0.085)	(0.105)	1

4.3 Diagnostic Tests

Before running the regression analysis, the tests for (a) multicollinearity, (b) autocorrelation, (c) stationarity and (d) heteroscedasticity issues were conducted.

Table 4. Summary of Diagnostic Tests

#	Tests	Threshold	Model Results	Conclusion
(a)	Multicollinearity	VIF > 10	Mean VIF is 1.94 and individual VIFs range from 1.05 to 3.13.	Not present.
(b)	Autocorrelation	p-value < 0.05	p-value is 0.4340.	Not present.
(c)	Stationarity	p-value < 0.05	All variables except for ComPrice showed strong stationarity across all four Fisher-type test statistics. ComPrice has been adjusted to be stationary by taking the first difference (dComPrice).	All variables are stationary.
(d)	Heteroskedasticity	p-value < 0.05	p-value is 0.0000.	Present.
(e)	Cross-Sectional Dependence	p-value < 0.05	Could not be tested due to an unbalanced panel with insufficient overlapping observations.	n/a

**VIF = Variance Inflationary Factor*

The model does not exhibit multicollinearity or autocorrelation but presents heteroscedasticity. Therefore, Driscoll–Kraay model was employed in order to empirically investigate the variables.

4.4 Regression results

Table 5. Regression table

Variable	FE (Clust.) Coef.	FE p-value	DK Coef.	DK p-value
LN_Asset	–0.0085	0.713	–0.0085	0.581
GPM	0.4631	0.001 ***	0.4631	0.000 ***
LEV	–0.00063	0.000 ***	–0.00063	0.000 ***
LIQ	0.00554	0.281	0.00554	0.115
GDPG	0.00547	0.308	0.00547	0.020 **
dComPrice	0.00168	0.157	0.00168	0.000 ***
INFL	–0.00282	0.296	–0.00282	0.087 *
ENV	–0.0936	0.154	–0.2590	0.020 **
SOC	0.01537	0.256	0.00746	0.082 *
GOV	–0.00032	0.882	–0.00482	0.096 *
ESG	omitted	n/a	0.1699	0.055 *
Y2015	0.03148	0.342	0.03148	0.054 *
Y2020	0.02947	0.534	0.02947	0.12
Y2022	0.05711	0.249	0.05711	0.000 ***
_cons	–0.9232	0.267	omitted	n/a
*** p < 0.01 ** p < 0.05 * p < 0.10				
		Number of obs		136
		Number of groups		15
		Within R^2		0.5472
		F-statistic		25,955.06
		Prob > F		0.0000

Gross profit margin (GPM) has a strong and statistically significant positive impact on ROA at the 1% level. The coefficient shows that 1% increase in GPM translates into 0.46% increase in ROA. This effect is expected because mining firms with better cost control and stronger margins can better utilize their assets. Research on mining industries provides limited evidence on how GPM or even Net Profit Margin affects ROA. Most existing work discusses GPM and NPM impact on revenue growth. The wider literature shows the relationship between GPM and ROA varies across industries. For instance, GPM has a positive and significant influence on ROA in banking sector (Malahayatie & Nurhaliza, 2020). The result is consistent with the profitability–efficiency theory, which states that firms with better operating margins achieve higher financial performance.

Leverage (LEV) is statistically significant at the 1% level and has a negative effect on ROA. 1% increase in Leverage leads to 0.0006% decrease in ROA. The magnitude is small but negative, which shows that higher indebtedness reduces profitability through increased interest burden and financial risk. This result is consistent with recent evidence from mining firms, where leverage ratios such as Debt to Equity Ratio and Debt to Asset Ratio are found to be either negatively associated with ROA or statistically insignificant (Marliza, 2024). Overall, the finding aligns with

the risk-return trade-off theory, which predicts lower returns when firms take on excessive leverage.

GDP Growth (GDPG) is significant at the 5% level and has a positive effect on ROA. 1% increase in GDP growth translates into 0.005% increase in ROA. The magnitude is modest, but it shows that when the economy expands, mining firms benefit through higher demand for mineral products, which increases revenues and improves asset profitability. This relationship is expected because mining output is closely tied to economic activity. Recent research also confirms that mining profitability tends to rise during periods of economic growth, reflecting the sector's pro-cyclical nature (Veronica & Sari, 2024). Overall, this finding supports the business cycle theory which states that companies perform better during economic expansions and worse during recessions.

Commodity Price Change (dComPrice) is significant at the 1% level and has a positive effect on ROA. 1% increase in Commodity Price Change leads to around 0.002% increase in ROA. The coefficient shows that profitability rises when commodity prices increase, reflecting how closely mining firms depend on global price movements. This is expected because higher mineral prices directly raise revenues and margins in extractive industries. This is consistent with evidence from Indonesian mining firms showing that external price conditions are among the strongest drivers of sectoral profitability (Veronica and Sari, 2024). Overall, this finding supports the commodity price theory, which states that firms in resource sectors perform better when market prices for their products rise.

Inflation (INFL) has a negative but small effect on ROA and is only marginally significant at the 10% level. 1% increase in inflation will decrease the ROA by 0.003%. The negative direction suggests that higher inflation increases operating and input costs, which can reduce profitability. However, the effect remains weak because mining companies may partially offset inflationary pressures by adjusting their selling prices, especially during strong commodity cycles (Veronica & Sari, 2024). This is consistent with earlier research showing that inflation tends to reduce real profits in capital-intensive industries, although the impact may be muted when firms have some pricing power. Overall, the result aligns with the business cycle theory, which argues that firms experience margin pressure and weaker performance during high-inflation phases of the economic cycle.

Environmental Indicator (ENV) has a negative and statistically significant impact on ROA at the 5 percent level. 1% increase in environmental variable leads to 0.26% decrease in ROA. The magnitude is meaningful which shows that higher carbon intensity is associated with substantially lower profitability. This suggests that when environmental performance is poor, mining companies face higher operational costs, lower efficiency and more regulatory pressure, all of which reduce returns on assets. This is consistent with evidence from Chinese mining firms, where higher carbon intensity is associated with greater regulatory exposure and lower operational efficiency, both of which reduce returns (Sun et al., 2020). Overall, the result supports sustainability-performance theory, which argues that weak environmental performance leads to weaker financial outcomes.

Social Indicator (SOC) is significant at the 10 percent level and has a positive effect on ROA. 1% increase in social variable will increase the ROA by 0.007%. Although the coefficient is small, the direction shows that stronger social conditions, captured here through higher female labor force participation, are linked to better profitability. This suggests that more inclusive labor markets may support productivity and overall firm performance. Evidence from listed companies also shows that the social pillar is positively related to ROA, indicating that social responsibility and stronger social practices can enhance profitability in certain contexts, as highlighted by Gadekar et al. (2024). The result is broadly in line with ESG research and supports stakeholder theory, which argues that socially supportive environments can contribute to improved financial outcomes.

Governance Indicator (GOV) is marginally significant at the 10 percent level and shows a small negative effect on ROA. 1% increase in governance variable will decrease the ROA by about 0.005%. Although the magnitude is limited, the negative direction suggests that stronger regulatory quality may increase compliance and administrative costs for mining firms, which could reduce short-term profitability. Similar patterns have been observed in other regions such as Malaysia and Thailand, where governance scores sometimes show a negative or insignificant impact on ROA because the costs of adopting or enforcing governance practices can outweigh the immediate financial benefits (Abubakr, 2025). At the same time, the broader literature generally reports a positive link between governance and firm performance, meaning that the relationship may depend heavily on the specific sector and country context. This indicates that the disclosure theory in the mining industry should be explored further.

ESG Composite is significant at the 10 percent level and shows a positive effect on ROA. 1% increase in ESG composite variable leads to 0.17% increase in ROA. Such high impact indicates that when environmental, social and governance dimensions are combined into a balanced sustainability score, they contribute to stronger financial performance. The p-value in the Driscoll–Kraay model improved compared to the clustered estimation, which suggests that the DK results provide a better representation of the ESG–profitability relationship in this dataset. Evidence from Levant countries also shows that collective ESG performance enhances financial results, including ROA, and that firms with stronger stakeholder engagement and clearer sustainability disclosure tend to perform better (Amosh et al., 2023). This supports the idea that integrated ESG practices can strengthen firm profitability and is consistent with stakeholder theory, which argues that firms with broader responsible practices can achieve better long-term financial outcomes.

Time Dummies: 2015 and 2022 are significant at the 10 percent and 1 percent levels with positive effect on ROA by increasing it by 0.03% and 0.06%, respectively. This indicates that mining companies earned substantially higher profits in 2015 and 2022 compared to the base year. 2015 is the year when foreign exchange rate in Kazakhstan (the majority of data set) devalued by over 100% while 2022 exhibits the global surge in commodity prices during the post-pandemic period, which boosted revenues across the sector. In 2022, the sharp increase in commodity prices appears to have outweighed the negative effects of political tensions and instability in the region, allowing firms to maintain strong financial performance. This aligns with literature showing that

mining profitability rises sharply during commodity booms regardless of broader macroeconomic disruptions.

Overall: R-squared is a statistical measure that indicates the percentage of how much the dependent variable is explained by the independent variables selected and whether the data fits the model. In this case, 54% of changes in ROA are explained by changes in independent variables. The F-test is Prob > chi2, which is 0, meaning it is significant, which in turn means the whole model is best fitted or statistically validated and can be relied upon.

4.5 Robustness Checks

Since the dataset is panel data covering multiple firms across several countries (each country having its own regulatory framework and market dynamics), Ordinary Least Squares (OLS) approach is not suitable. Additionally, OLS cannot properly address issues for heteroscedasticity, serial correlation or multicollinearity. Therefore, a Hausman test was conducted to choose between random and fixed effects, and the results indicated that the fixed effects model is more appropriate.

The fixed effects model was first estimated with clustered robust standard errors to correct for heteroscedasticity. While some variables were significant (GPM and LEV), this approach does not address potential cross sectional dependence, which is common in commodity linked industries.

To improve reliability, the model was re-estimated using Driscoll–Kraay standard errors, which corrected for both heteroscedasticity and cross sectional dependence. This specification produced stronger and more consistent significance across variables, and therefore the Driscoll–Kraay results were adopted as the main model for interpretation.

5. Conclusion

This study examined how firm specific, macroeconomic and sustainability factors shape profitability in the mining industry of Central Asia and the Caucasus using panel data from 2010 to 2024 and a fixed effects model with Driscoll–Kraay corrections. The objective was to identify which internal and external forces influence ROA in a region where empirical research remains limited.

The findings of the analysis are following: GPM, GDP growth, commodity prices, social conditions, and ESG score have positive impact on ROA while leverage, inflation and environmental intensity show negative impact on ROA. Governance pillar, which had mixed and sector specific impact on other studies, exhibited a marginal negative link with ROA which suggests that compliance and regulatory pressures may influence short-term performance in the mining sector. Last but not least, both time dummies for years 2015 and 2022 improved the ROA of mining companies in selected region.

These results provide several implications. For business owners, maintaining strong operating margins and managing leverage conservatively seem essential for improving resilience

in a volatile commodity environment. Integrated sustainability practices particularly those linked to social conditions can support long term financial outcomes. For policymakers, the stable macroeconomic environments, predictable regulatory frameworks and targeted environmental interventions can improve both sectoral stability and national economic performance. More broader implication of the research is that mining companies operating in countries with stronger sustainability and economic fundamentals tend to experience more stable profitability outcomes.

The study contributes to the limited empirical evidence on mining firms in Central Asia and the Caucasus by developing a region-specific dataset that incorporates ESG dimensions into profitability analysis and applying an estimation method suitable for cross sectional dependence. It also provides new insights into the role of operational efficiency and macro sustainability indicators in shaping financial performance in resource driven economies.

The study has some limitations, namely only firms with publicly available financial statements were taken which excludes some countries as described above. ESG indicators rely on country level proxies because of limited firm level sustainability reporting. The governance measure used may not fully reflect internal governance structures or board level practices. These constraints require careful interpretation of the results.

Future research can take several directions. First, rather than using county-level ESG proxies, the future study on profitability (ROA, ROE) can be re-analyzed using firm-level ESG data in 4-5 years once there will be enough data points. Second, researchers can explore how climate transition risks, such as carbon pricing or emissions reduction mandates, alter profitability dynamics in mining. Third, the role of technological upgrading including automation, digital monitoring and advanced processing techniques can be assessed to understand how innovation affects operational efficiency and financial outcomes. Fourth, given the ownership structure may influence financial behavior and performance of the firm, the future studies can also consider having an additional independent variable on type of ownership (state owned, private and foreign owned mining companies). Finally, extending the analysis to include productivity measures, cost curves and long run investment cycles can provide a deeper understanding of how mining companies respond to global commodity shocks over time.

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Open Government and the Entrepreneurial Sector in Kazakhstan: Digital Governance, Communication, Trust.

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ABSTRACT

This research aims to investigate how open government tools and digital public services affect communication, trust, and public value in the relationships between entrepreneurs and government institutions in Kazakhstan. Digital governance strategies are implemented to improve transparency and the ease of doing business in a country; however, the impact of such strategies is variable.

The methodology of the research is qualitative in nature and includes interviews with entrepreneurs and analysis of documents. The research focuses on daily interactions of entrepreneurs with digital tools such as e-government platforms.

The findings of the research are indicative of the fact that though digital tools are helpful in enhancing ease of access and ease of doing business, there are limitations in terms of communication and administrative ease; these limitations affect trust and the generation of public value in a significant way.

The research contributes to the body of knowledge by offering a qualitative perspective on a post- Soviet country.

KEYWORDS: open government, digital governance, entrepreneurship, public value, trust, Kazakhstan

1. INTRODUCTION

In the last two decades, digitalization has become a key element of public sector reform, closely tied to the broader idea of open government. Governments are increasingly turning to digital tools to boost transparency, make services more accessible, and improve administrative efficiency (OECD, 2016). This shift is especially important in the economic sphere, where entrepreneurs regularly engage with public institutions.

In Kazakhstan, digital government reforms have been actively promoted as part of wider modernization efforts. The rollout of e-government platforms, licensing systems, and online

communication channels reflects a clear policy focus on improving service delivery and reducing administrative burdens. In theory, these changes are meant to simplify procedures and support a more business-friendly environment.

However, even with the expansion of digital services, their real-world impact has been uneven. While online platforms have made services more accessible and reduced the need for face-to-face interactions, they have not fully addressed deeper administrative challenges. Entrepreneurs still face issues such as unclear requirements, slow responses, and inconsistent communication. This aligns with a broader trend noted in the literature: digital systems often replicate existing bureaucratic complexity rather than truly transforming it (Janssen et al., 2012).

Few studies look at how users experience these systems in daily interactions, especially in post-Soviet contexts, while the majority of existing research focuses on macro-level indicators like service availability and efficiency. As a result, there is a disconnect between formal assessments of digital governance and its real-world applications. This study helps close that gap and offers a more grounded understanding of how digital public services operate in reality by concentrating on the lived experiences of entrepreneurs.

This disconnect between policy goals and everyday experience raises important questions about how effective digital governance reforms really are. Although digitalization is often associated with efficiency and simplification, research shows that its success largely depends on how it is implemented and experienced by users (Margetts & Dunleavy, 2013).

Entrepreneurs are a particularly useful group for assessing these reforms. Because they frequently interact with government bodies for registration, licensing, and regulatory compliance—their experiences offer valuable insight into how administrative systems actually function, beyond what formal indicators might suggest.

Alongside communication and trust, this study also focuses on the concept of public value. Public value refers to the benefits that government actions deliver to users, such as efficiency, accessibility, and service quality (Moore, 1995). In digital governance, the key issue is not just whether services are available online, but whether they genuinely improve the user experience.

Although the idea of digitalization is seen as a solution for the inefficiency of public administration, the results depend on the overall context. In many respects, the reforms carried out in the context of digitalization address the use of technology, not the administration itself. Therefore, the use of technology increases the level of accessibility, while the overall decision-making and interpretation of procedures remain the same.

This is seen as an overall institutional approach, which argues that the overall reforms carried out in any system do not necessarily mean that the results will change (North, 1990). In the context of transitional countries, such as Kazakhstan, this might be seen as an even bigger problem, as technology is introduced in the context of administration, not instead of it.

Overall, this study examines how digital public services and open government tools influence interactions between entrepreneurs and government institutions in Kazakhstan, with particular attention to communication, trust, and public value.

The study is guided by the following research question:

How do open government tools and digital public services shape communication, trust, and public value in interactions between entrepreneurs and government institutions in Kazakhstan?

The remainder of this paper is structured as follows. The next section presents a review of the relevant literature on open government, digital governance, communication, trust, and public value. This is followed by the methodology section, which outlines the research design, data collection, and analytical approach. The subsequent section presents the findings based on the interview data. The discussion section then interprets these findings in relation to existing literature and theoretical perspectives. Finally, the paper concludes with key insights, implications, and suggestions for future research.

2. LITERATURE REVIEW

The concept of open government has moved from the initial perspective of transparency to the broader perspective of governance, including participation, accountability, and digital transformation (OECD, 2016; Meijer et al., 2012). In this perspective, the concept of digital government takes the central position in the development of new forms of interaction between public institutions and their stakeholders.

Digitalization, it is widely agreed, contributes to the efficiency, reduction of administrative burdens, and increased accessibility of public services. The development of e-government platforms allows citizens to access services remotely, thus eliminating the need for direct interaction with public officials (Margetts & Dunleavy, 2013). In the perspective of entrepreneurs, this could mean the simplification of processes such as business registration, licensing, and reporting.

However, the literature also points to some limitations in the development of digital governance. One of the limitations most frequently referred to in the literature is the possibility for digital governance to replicate the complexities of the bureaucracy it sought to replace, instead of replacing them. In this perspective, the development of digital governance does not transform the complexities of the bureaucracy but, instead, adds them (Janssen et al., 2012).

In this regard, the factor of user experience takes the central position. The literature shows that digital platforms, though functional, are not always designed for the convenience of the users. In this regard, it appears that the success of digital governance does not only depend on the development of the platforms but also on their convenience for the users.

Another important aspect of trust is institutional trust. This type of trust is influenced not only by the structure of the institution, but also by the quality of the interaction between citizens and the administrative system. Such qualities as communication and response time are crucial in developing trust in the government and its institutions. On the contrary, delays and ambiguity might undermine trust in government and its institutions.

In addition to institutional frameworks, user experience and interaction quality also influence trust in digital government. According to research, interactions that are consistent, predictable, and responsive foster trust rather than transparency alone (Grimmelikhuijsen & Meijer, 2014). Clarity and responsiveness are even more important in digital settings where in-person communication is less common. Even in cases where services are technically accessible, poor communication, delays, and a lack of feedback can have a negative impact on trust.

Digitalization is also expected to contribute to the development of trust in government. However, empirical evidence suggests that the availability of digital tools is not necessarily a guarantee of the development of trust. On the contrary, trust is developed through repeated interactions and experiences, especially in communication.

The concept of public value is also crucial in the assessment of digital governance. This is defined as the benefits generated by the government and its institutions, such as efficiency, quality of services, and trust. In the context of digital governance, the concept of public value is particularly interesting. This is because the experience of digital governance is not necessarily influenced by its availability, but by its experience.

Recent research on digital governance suggests that the assessment of the concept of public value should be conducted from the point of view of the users. This is not limited to the availability of services, but also to the quality of procedures and the usability of the systems. This is particularly interesting in the context of the post-Soviet and transitional societies, where the formal structure of the government is combined with the administrative practices. In such contexts, digital tools

might not replace the existing administrative systems, but might interact with them. This might lead to the development of a new form of governance, which is not necessarily more effective.

Overall, the literature suggests that while there is potential for improved interaction between the state and economic actors through digital governance, this ultimately depends upon the quality of implementation, user experience, and communication. These factors are seen as key influences in the creation of trust and public value.

Digital Governance and Institutional Context

This has been emphasized in recent studies, where it has been made clear that the success of digital governance largely depends on the institutional setting. It has been emphasized that the tools of digital governance cannot be used in isolation, but they must be considered in the broader setting of the existing administrative systems.

In transitional societies, including post-Soviet societies, it has been observed that administrative reforms, including formal ones, often exist alongside informal practices. This means the existence of a hybrid system of governance, where digital governance does not replace but complements the conventional systems. In this regard, it has been emphasized that improved access does not necessarily lead to improved efficiency or clarity (United Nations, 2020).

This approach also focuses on the significance of understanding the use and interpretation of digital governance systems, not only their development.

3. METODOLOGY

Research Design

This study uses a qualitative research design to explore how entrepreneurs in Kazakhstan experience digital public services. A qualitative approach is well suited for this purpose, as it allows for a deeper understanding of people's perceptions, interactions, and the institutional context—things that are difficult to fully capture through quantitative methods (Creswell & Poth, 2018).

The research is exploratory in nature, focusing on how key ideas such as communication, trust, and public value are shaped through everyday interactions with government institutions.

Data Collection

Data were gathered through semi-structured interviews with entrepreneurs who have direct experience using digital public services. This method offers a useful balance: it ensures that key

topics are covered while still giving participants the freedom to share their experiences in their own words.

The interviews focused on several main areas:

- experiences with digital public services;
- communication with government institutions;
- perceived benefits and challenges;
- responsiveness and trust;
- perceptions of public value.

To ensure participants could express themselves clearly, interviews were conducted in Russian, Kazakh, or English, depending on their preference.

Sampling Strategy

Participants were selected using purposive sampling, meaning they were chosen based on their relevance to the research topic. The study mainly focuses on entrepreneurs who regularly interact with government institutions, particularly those running small and medium-sized enterprises.

This approach aligns with qualitative research practices, where the goal is not broad statistical representation but a rich, context-specific understanding of experiences (Creswell & Poth, 2018).

Data Analysis

The data were analyzed using thematic analysis, a widely used method in qualitative research for identifying patterns and recurring themes (Braun & Clarke, 2006).

The analysis involved several steps:

- becoming familiar with the data through repeated reading of interview transcripts;
- generating initial codes to capture key ideas;
- organizing these codes into broader themes;
- interpreting the themes in relation to the research question;

This process makes it possible to gain both descriptive and deeper interpretive insights into how digital governance reforms are experienced in practice.

Ethical Considerations

The study received ethical approval from the Institutional Review Board (IRB). Participation was voluntary, and informed consent was obtained from all participants before the interviews took place.

To protect confidentiality, all data were anonymized. Participants are identified using general labels, and no personal or sensitive information is disclosed.

Researcher Positionality

The researcher has professional experience working within a local government institution, which provides valuable insight into administrative processes. At the same time, this background requires careful attention to potential bias.

To address this, a reflexive approach was adopted. The analysis relies primarily on interview data, with conscious effort made to avoid assumptions based on personal experience.

Limitations

Like most qualitative studies, the findings are not intended to be statistically generalizable. The sample size is relatively small, and the research focuses on a specific national context.

Additionally, the study is based on self-reported experiences, which may reflect individual perspectives. However, these perspectives are essential for understanding how communication, trust, and public value are actually formed in practice.

Overall, this methodology provides a solid foundation for exploring how digital public services are experienced by entrepreneurs in Kazakhstan. By focusing on individual perspectives and real-life interactions, the study captures the nuanced ways in which communication, trust, and public value emerge in practice.

The following section presents the findings of the study, organized around the key themes identified during the analysis. These findings highlight how entrepreneurs navigate digital public services and how their experiences shape broader perceptions of government effectiveness and institutional trust.

Methodological Justification

The use of a qualitative methodological approach is particularly pertinent for this study, as it provides an opportunity for the exploration of subjective experiences, which are critical for understanding digital governance.

The use of a qualitative methodological approach is pertinent because, for example, "trust," "communication," and "public value" cannot be measured through quantitative methods.

The focus on individual experiences provides an insight into how systems are being interpreted and how they are being used, and this is particularly pertinent when one considers situations where not all may be reflected through formal indicators.

4. FINDINGS

This study draws on semi-structured interviews with entrepreneurs who have firsthand experience using digital public services to interact with government institutions. Although the data collection is still ongoing, several clear patterns have already emerged, offering useful insight into how these systems actually work in practice.

Four main themes stand out: communication challenges, user experience, institutional trust, and uneven public value. These themes are closely connected and point to broader issues in how digital governance is being implemented.

Communication Challenges

One of the most common concerns raised by participants is communication. While digital platforms have made it easier to submit applications and documents, this hasn't necessarily improved the quality of interaction.

Many respondents mentioned delays in receiving replies, as well as unclear or incomplete responses. In some cases, answers didn't fully address their questions, forcing them to follow up multiple times. As one participant put it, submitting documents online is easy, but "the response does not always answer the question."

Another issue is the lack of transparency during the processing stage. Entrepreneurs often don't get updates on the status of their requests, which creates uncertainty and makes planning more difficult.

Overall, these findings suggest that while digitalization has made processes more accessible, it hasn't significantly improved communication itself. The problem seems to lie more in institutional practices than in the technology.

User Experience and Administrative Complexity

User experience is another key theme. Most participants agreed that digital services reduce the need to visit government offices in person, which is a major advantage.

However, this convenience often comes with new challenges. Many users find the platforms difficult to navigate and not very intuitive. Instructions are not always clear, and requirements sometimes only become apparent later in the process. This means users are left to figure things out on their own, increasing the risk of mistakes and delays.

Participants also pointed out that different systems are not well integrated. Entrepreneurs often have to use multiple platforms for different tasks, which takes more time and effort.

In this sense, digitalization doesn't remove complexity—it shifts it onto the user. This shows that access alone isn't enough; clarity and usability are just as important.

Trust and Institutional Responsiveness

Trust in government institutions came up repeatedly in the interviews. Participants made it clear that trust depends less on the existence of digital systems and more on how responsive those systems are.

Quick, clear replies tend to build trust, while delays and vague communication lead to frustration. As one respondent explained, "it is not about whether the system exists, but how quickly and clearly they respond."

Interestingly, digitalization doesn't automatically increase trust. In some situations, the lack of direct human interaction actually makes it harder to resolve issues, pushing users to rely on informal channels instead.

This suggests that trust develops through consistent and reliable communication over time. Digital tools can help, but only if they are supported by effective communication practices.

Public Value and Perceived Effectiveness

Looking at the broader picture, the idea of public value helps explain how these services are experienced. Participants recognized that digital platforms improve access and reduce the need for in-person visits.

At the same time, opinions on overall effectiveness were mixed. While digital services are often more convenient, they don't always lead to better outcomes in terms of clarity or efficiency.

Several respondents noted that digitalization improves how interactions look and feel, but not necessarily the results. Communication problems and administrative complexity still limit the benefits.

Another important point is that these benefits are not evenly distributed. Digital services tend to work well for simple tasks but become less effective in more complex situations. More experienced users can navigate the systems more easily, while others struggle.

This shows that public value is created unevenly, depending both on how the system is designed and on the user's level of experience.

Interpreting Digital Interaction as a Process

Another interesting aspect that follows from the results is the need to see the interaction with digital public services not as a one-time event, but rather as a process. The entrepreneurs do not just use the digital platform; they interpret, adapt, and even problem-solve.

This approach, which focuses on the process, underlines the fact that digital governance is a continuous interaction between the user and the institution. The effectiveness of the digital system is not just dependent upon the system itself, but also upon the adaptation of the user.

Summary of Findings

Overall, the findings suggest that digital public services in Kazakhstan represent a step forward, but only a partial one. Access has improved, but key issues, especially around communication, usability, and responsiveness remain. In other words, digitalization has changed how people interact with government, but it hasn't fully transformed the system itself. As a result, the benefits of digital governance are still uneven and depend heavily on how well these systems are implemented.

5. DISCUSSION

This study looks at how digital public services actually function in Kazakhstan and shows a more mixed picture than policy discussions often suggest. While digitalization has made access to

services easier in many cases, its broader effects, especially on communication, institutional trust, and public value, are less straightforward.

In addition to institutional frameworks, user experience and interaction quality also influence trust in digital government. According to research, interactions that are consistent, predictable, and responsive foster trust rather than transparency alone (Grimmelikhuijsen & Meijer, 2014). Clarity and responsiveness are even more important in digital settings where in-person communication is less common. Even in cases where services are technically accessible, poor communication, delays, and a lack of feedback can have a negative impact on trust.

One of the main observations is that digitalization has not fundamentally changed administrative processes. Instead, it has mostly changed how users engage with them. Entrepreneurs can now submit applications online and access services remotely, but familiar issues such as unclear instructions, slow responses, and procedural uncertainty remain. In this sense, digital systems often reproduce existing bureaucratic patterns rather than replacing them (Janssen et al., 2012).

It is therefore more accurate to describe digital governance as a reconfiguration of interaction rather than a full transformation of administration. The shift to online platforms reduces some practical barriers, particularly those related to time and physical presence, but it does not remove the underlying complexity of administrative procedures. In some cases, this complexity is simply shifted onto users, who are expected to navigate systems on their own.

Communication emerges as a consistent weak point. Although digital platforms provide formal channels for interaction, they do not necessarily improve how information is communicated. Many participants described communication as reactive, fragmented, and often lacking clarity. This suggests that the effectiveness of digital services depends not only on technological infrastructure, but also on how communication is handled within institutions.

This finding reflects a broader argument in the literature that digital governance should not be seen as purely a technological development. Without changes in administrative routines and practices, the introduction of digital tools alone is unlikely to significantly improve user experience (Margetts & Dunleavy, 2013).

User experience itself remains uneven. While services are more accessible, usability is still a challenge. Participants frequently mentioned difficulties in navigating platforms, understanding requirements, and dealing with multiple systems at once. Rather than reducing administrative burden, digitalization sometimes redistributes it, placing more responsibility on users.

These issues point to the importance of user-centered design, which still appears underdeveloped in this context. The value of digital services should be assessed not only by whether they are available, but also by how usable and effective they are in practice (Cordella & Bonina, 2012). In many cases, lack of clarity and poor integration between systems limit their usefulness for entrepreneurs.

Institutional trust is also shaped less by the presence of digital systems and more by the quality of interaction. Responsiveness seems to be particularly important. When communication is timely and clear, users tend to report more positive perceptions. When it is delayed or ambiguous, trust declines. This suggests that trust is built through repeated interactions rather than through formal systems alone (Rothstein & Stolle, 2008).

At the same time, digital tools do not automatically improve these interactions. In some situations, the absence of direct contact makes it harder for users to resolve issues, leading them to seek help through informal channels instead.

From a public value perspective, the results are similarly mixed. Digital services clearly improve accessibility, but their contribution to efficiency, clarity, and predictability is less consistent. This indicates that the benefits of digitalization are uneven and depend heavily on how systems are implemented and used.

From this perspective, digital governance should be judged in relation to outcomes that matter to users, such as ease of use, reliability, and the ability to solve problems effectively (Moore, 1995). In this study, those outcomes are only partly achieved. Digitalization brings some improvements, but many important issues remain unresolved.

The findings also show variation across users. More experienced entrepreneurs are generally better able to navigate digital systems, while those with less experience face more difficulties. This suggests that digitalization may inadvertently reinforce differences in capability and access.

Another notable point is the continued role of informal practices. Despite the availability of digital platforms, some users still rely on personal contacts or alternative channels when problems arise. This indicates that digital systems have not fully replaced traditional forms of interaction, but instead coexist with them in a hybrid administrative environment.

Overall, the findings highlight the importance of implementation. Digital reforms are often evaluated based on their technical features, but their actual impact depends on how they function in everyday use. Issues such as communication, responsiveness, and system integration remain central.

In the case of Kazakhstan, this suggests that while digital infrastructure has developed significantly, further progress depends on improving how these systems operate in practice. Greater attention to communication processes, usability, and user needs is likely to be necessary if digital public services are to deliver more consistent value and strengthen institutional trust.

Reinterpreting Digital Governance in Practice

Digital governance is often described as a transformative force that can fundamentally improve the relationship between the state and economic actors. However, the findings of this study point to a more nuanced reality. Instead of fully transforming administrative processes, digitalization tends to reshape existing practices without removing their underlying complexity.

This distinction matters because it challenges the idea that technological innovation alone can drive meaningful institutional change. While digital tools do alter how people interact with government services, they do not necessarily change how decisions are made within administrative systems. As a result, greater accessibility often exists alongside ongoing issues with communication and procedural clarity. (Janssen et al., 2012).

From this perspective, digital governance can be seen as a layered process, where new digital systems are built on top of existing institutional structures rather than replacing them entirely. This layering helps explain why entrepreneurs continue to face inconsistencies and inefficiencies, even when digital platforms are available.

Implications for Digital Governance Design

The findings of this study point to several important implications for how digital public services are designed. Most notably, they suggest the need to move beyond a purely technology-driven approach toward a more user-centered model of governance.

First, communication should be understood as a central element of digital systems rather than a secondary feature. Clear, timely, and context-specific communication plays a key role in shaping user experience and building institutional trust (Rothstein & Stolle, 2008).

Second, the issue of system integration remains a major challenge. When digital platforms are fragmented, users face a higher cognitive burden, and administrative processes become less efficient. Addressing this problem requires a more coordinated and user-focused approach to system design (Cordella & Bonina, 2012).

Third, digital governance needs to account for differences in user capabilities. Not all users have the same level of experience or familiarity with administrative procedures. Designing

platforms that are inclusive and easy to navigate is therefore essential for ensuring that public value is delivered more consistently across different groups (Moore, 1995).

Practical Implications for Policymakers

The findings of this study suggest several practical implications for policymakers involved in digital governance reforms.

Improving communication quality should be a priority. This includes providing clearer instructions, more informative responses, and better feedback mechanisms throughout administrative processes. Strengthening communication practices is essential for enhancing trust and improving user experience (Rothstein & Stolle, 2008).

In addition, efforts should be made to simplify user interfaces and reduce fragmentation across platforms. A more integrated and intuitive system design may significantly enhance usability and reduce administrative burden (Margetts & Dunleavy, 2013).

Finally, digital reforms should be accompanied by organizational changes within public institutions. Without improvements in internal processes and responsiveness, the potential benefits of digitalization are unlikely to be fully realized (Janssen et al., 2012).

However, it's crucial to evaluate the notion that better governance is a natural consequence of digitalization. This assumption might be too optimistic, according to the study's findings. Digital tools make things more accessible, but they don't always solve more serious administrative inefficiencies.

This begs the question of whether more significant institutional change is occasionally replaced by digital reforms. Digitalization runs the risk of becoming a surface layer rather than a transformative process if underlying administrative practices are not addressed.

6. CONCLUSION

This This paper explores the impact of digital public services and open government tools on the interaction between entrepreneurs and government institutions in Kazakhstan, with a focus on communication, institutional trust, and public value.

The results of this paper indicate that digitalization has contributed to significant improvements in accessibility, making it easier for entrepreneurs to interact with government institutions and reducing the necessity of physical contact. Nevertheless, not all areas of administrative work are equally affected by digitalization.

One of the major conclusions of this paper is that the success of digital government not only depends on the presence of digital tools but also on how these tools are actually experienced by users. In particular, the quality of communication and the level of responsiveness are decisive factors for building institutional trust. Digital tools are not sufficient on their own to build trust.

This paper also demonstrates that public value is not created equally. While digital public services contribute to significant improvements in accessibility and convenience, their contribution to efficiency, clarity, and predictability is limited. In other words, digitalization appears to be a partial improvement rather than a comprehensive one.

From the theoretical perspective, the study makes an impact on the relevant literature due to the unique perspective offered, particularly regarding the post-Soviet region, the lack of correspondence between formal digital governance, and the importance of paying attention to the experience of users, as well as the quality of interaction, instead of formal measures of digitalization.

From the practical perspective, the study makes the following recommendations for policymakers: it is necessary to pay attention not only to the development of digital infrastructure but also to the quality of its implementation, particularly regarding the clarity, responsiveness, and usability of communication, because this plays an important role in the development of trust in institutions, as well as the overall creation of public value.

The study has some limitations, such as the small sample size, the focus on the national perspective, and the fact that the results are based on the experiences reported by the respondents. However, these factors are important for understanding the perspectives on digital public services.

From the methodological perspective, it would be worthwhile to expand the sample, include other stakeholders, such as public officials, or use mixed methods for collecting the data. It would also be worthwhile to compare the results in different countries or regions to obtain a broader perspective on the results of digital governance.

However, it's crucial to evaluate the notion that better governance is a natural consequence of digitalization. This assumption might be too optimistic, according to the study's findings. Digital tools make things more accessible, but they don't always solve more serious administrative inefficiencies.

This begs the question of whether more significant institutional change is occasionally replaced by digital reforms. Digitalization runs the risk of becoming a surface layer rather than a transformative process if underlying administrative practices are not addressed.

The study shows that the development of digital public services in Kazakhstan marks an important step in the development of public administration, but it also shows the importance of the correspondence between the development of digital public services and their implementation in daily administration.

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Inequality of Opportunity and Digital Transition: Case Study of Kazakhstan

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Abstract

The unprecedented level of development and full implementation of information, communication and digital technologies is leading to the transformation of large-scale socio-political and economic processes, the constant complexity of the socio-economic structures of society. These route to uncertainty, instability and risk. Among them: a decrease in the number of workers, monopolization of the market and weakening of competition, an increase in the inequality of economic development between countries, the strengthening of cross-border migration processes, an increase in the inequality of income distribution and access to basic social benefits and rights, a weakening of the democratic foundations of society. All this leads to social fragmentation and inequality, the emergence of new forms of inequality.

Key words: inequality of opportunity, digital transition, background structure, society, employment, income, education.

Introduction

Inequality of opportunity is when opportunities in life are limited based on a person's gender, place of birth, parental upbringing, or other factors beyond their control (usually at birth). A key feature of the opportunity inequality index is that it shows the scale to which circumstances of one's birth impose a ceiling on future ascertains whether education achievements, kinds of work, and to some extent income and wealth (Life in Transition IV Household resilience in a turbulent world, 2024), ultimately depends on probability. It is not only unfair but also less effective. In terms of inefficiency, people who are not born with luck can be said to be those who are unable to realize their full potential, to a certain extent, which in turn indirectly hampers the entire economy from the development path. It is also highly unjustified in that it continues to support the bias of birthright benefits, absence of which privileges seem to be categorically frowned upon in modern society. Therefore, a polity with such glaring inequalities in welfare opportunity is bound to gravitate towards political disintegration, which by itself retards economic growth.

For decades, digital technology has constantly broadened the grand structures of economic and social systems. Indeed, the range of these is no less phenomenal than their current ubiquity in spheres of life, including education systems, labor markets, healthcare services, and information accessibility. The emergence of a new vision of the Internet based on the evolution of Internet

technologies together with mobile and AI technology opens up new possibilities for the advancement of the quality of life as well as the quality of work and processes of innovation. Along with improvements in digital connectivity, there are new obstacles to face, like the issue of digitalization inequality and digital skill inequality. Digitalization in the advanced society opens up opportunities to the whole social layer, but in the states with the non-uniform level of economic development, the gap in modern technology availability can get bigger for those marginalized for one reason or another. A fast-digitizing inequality trend is on the rise that could exacerbate some other social and economic disparities existing in the world today.The focus on this issue, as it is observed in developing nations, contributes significantly, where most of society does not have access to Internet platform systems, computers, and digital education platforms due to coalescing isolation and economic tightness, combined with educational weaknesses.

Kazakhstan plays a vital role in the introduction of the digital transformation, which includes the infusion of the economy, public administration, education, and society with the help of modern technologies. One of the main goals of the program "Digital Kazakhstan" includes an increase in broadband connectivity and the launch of electronic public services on a large scale.

The overall research aim of this study is to evaluate the effects of the digital transition on opportunity inequality in Kazakhstan, to pinpoint the primary factors contributing to the digital divide, and to propose strategies for its mitigation. To accomplish this aim, the following objectives have been outlined:

1. To explore theoretical frameworks pertinent to the examination of digital inequality.
2. To assess the current state of digital inequality in Kazakhstan utilizing data from the Life in Transition Survey (LiTS).
3. To conduct an econometric analysis of the determinants of digital inequality through the application of regression models.
4. Formulate relevant conclusions and recommendations to decrease the inequality opportunity.

Literature Review

Conceptualizing Inequality of Opportunity

The idea of an unequal society considers many opportunity differences between people born in quite less privileged circumstances with minimal control over their lives, along with people who are wealthier with greater resources. We are calculating, in this obvious disparity, not just the income, but the imposing barriers preventing others from fully achieving their dreams. One of the characteristics of Ferreira and Gignoux's (2011) analysis in this matter is the fact that these discrepancies have a significant impact on the structure of socio-economic results in the long run and quite often determine and strengthen cycles of poverty and exclusion.Many methods have been theorized by academicians. These methods assess success. They do so successfully by looking at

inequality. Bourguignon, Ferreira, and Menéndez (2007)address the topic in their work, where they are talking about the variations obtained in the personal efforts between the internal and external factors of economic development.Checchi and Peragine (2010)suggest an ex-ante and ex-post framework: ex-ante measures assess how opportunities are distributed among social groups, whereas ex-post measures examine inequalities in realized outcomes among individuals exerting similar effort. By outlining these measures, we can acquire very powerful instruments by which socially structurally gaps can was.

The Digital Divide is now a critical part of trending towards being unequal in access to education opportunities. Digital empowers those with both technical infrastructure and large digital literacy capabilities, a truly necessary aspect today. People can move from one economic social status to the other. Robinson et al. (2015) point out that digital competences and awareness of the internet steadily emancipate themselves as same important sources for an individual's economic growth and education, as the capital itself. At the same time, thelack of digital technologies is aggravating the existing gaps in employment or education opportunities. It is apparent from Dunaev and Co. (2018) works that such priority areas as education, financial services, and employment that always enable digital inequalities to exasperate the deemed rural areas of the populace limits their chances of meeting their dreams through the use of digital technologies. The problem with non-proactive policies, however, is a new way of deepening digital divides that might be counterproductive for the purpose of gradually reducing the traditional socio-economic divides. Hence, digital inclusion has to be a pre-approved component of national development policies by now. In digitalizing society, the specific solutions needed to reduce the digital divide have to be developed, such as joining coverage of internet access, education by means of digital literacy programs, and any effort of getting technology more widely accessible. Thinking through the prism of digitalization being one of the principal points of disparity in offering, we are in a position to make up better strategies to guarantee that IT changes are a spur towards wider inclusion, rather than a test of it.

Digitalization and Inequality of Opportunity in Kazakhstan

Kazakhstan has shown to what extent it has digitalized, with the availability of new technologies being high in the developed regions and among the middle-and upper economic tiers, whereas the less advantageous social groups and regions suffer. Aimbetov et al. (2020) investigate the inequality existing regarding distribution of ICT infrastructure, emphasizing the point that modern digital services have the city's location rather than the rural and remote areas being their common habitation. The scanty rainfall of the digital divide in the way one can afford to get educated, raise photographs, or even apply for a job can go ahead to a wide gap in socio-economics between a rich and a poor person. Kurman et al. figure out that in Kazakhstan, the devolution of ICT development is influenced by several factors. These include a regional rift consisting of the economic development level, continuing investments in ICT, and digital literacy skills among the workforces’ skills. As they say, the gaps shall remain unrepaired only if no appropriate policies to

improve the divide are introduced and implemented. Pertaining to the effect of information and communication economy to the education and job streams, digital exclusion in Kazakhstan is to be mentioned first. The tendency of having no access to digital resources in most rural schools results in students' being deprived of the new kind of skills that are increasingly being demanded for in the current job market thus adding on to unemployment and underemployment rates (Dunaev et al., 2024). Insufficiency of technological infrastructure at the physical workplace and absence of chances for training level the career field of workers in the low-income or local area, by reducing the capability of combat in the digital world. As a result, Robinson et al. (2015) also stressed on digital anomaly, which hinders the sustainability of professional development through e-learning (electronic learning). Professionals can also fail to use e-learning when searching for employment. As the digital along with the extraction of their digital tools become a precondition to get a paying job in almost every sector, the people whose access to digital tools is out of reach are becoming more and more trapped in the vicious circle of unemployment. It is an answer to these problems that the country initiated the Digital Kazakhstan, in order to increase the coverage of digital channels. While the access has been enhanced in urban communities (particularly the access to the internet and the electronic government has been refined), rural-urban digital divide still exists (Santos et al., 2022).

Research Gap

For all the reports and studies done on digital and equality of a social standpoint nonetheless, some major concerns still remain in regard to Kazakhstan. The primary research paradox is whether the provision of digital facilities to citizens actively minimizes the socio-economic gaps and disparities in the society or they just emphasize and boast the pre-existing social inequalities in the country. While existing research on ICT in education, finance, and labor gives ample proof that, in the present day, being digitally literate allows one to enjoy these perks; a minuscule empirical measurement on a social group comparative basis exists. In addition, there is an essential lack of in-depth research on the actual linkage between introduced digital projects and their impact on diminishing social and economic disparities in Kazakhstan. The study generally describes the digital gap, yet it provides more general observations and less well-proven impacts of digitalization in terms of the social mobility and economic performance of certain adjoint groups (including countrymen in need, people of fields, and elderly people with incapacity to further develop).

Methodology

The study uses secondary data from the Life in Transition Survey IV (LITS-IV), a cross-sectional survey conducted by the European Bank of Reconstruction and Development (EBRD) in collaboration with the World Bank. The survey was carried out in 2022-2023 across 33 EBRD economies and four comparator countries, including Kazakhstan. It provides a valuable dataset for examining economic conditions, social attitudes, digital use, and employment patterns.

Construction of the Opportunity Inequality Index and Digital Skills Index

In this research, two composite indices are constructed using Principal Component Analysis (PCA): an Opportunity Inequality Index that stratifies individuals based on their personal background attributes, and a Digital Skills Index derived from self-ascertainment of digital abilities. With PCA, one can carry out dimensionality reduction in multivariate datasets into a smaller set of uncorrelated components, making it possible to develop standardized indices from groups of correlated variables.

To capture the inequalities of opportunity, PCA is performed on a range of early life circumstance variables available in the Life in Transition Survey IV (LITS IV). These cover socioeconomic and demographic factors believed to be out of the individual's control:

- Father's education
- Mother's education
- Place of birth (urban/rural)
- Gender
- Number of books at home at age 16

Before applying PCA, all variables were standardized to enhance comparability.The first principal component (PC1) that is kept is viewed as latent index of opportunity, capturing the selected common variance of the selected circumstances. Higher index values reflect more advantageous backgrounds associated with greater access to opportunity - lower value indicates disadvantaged backgrounds.

In addition to background conditions, this analysis assesses the role of digitalization through a Digital Skills Index, also constructed using PCA. The index is based on self-reported responses to questions about the respondent's ability to perform various digital activities, including but not limited to using online purchasing, banking, learning, communication, e-gov and programming skills. The responses, whether binary or ordinal, were recoded and normalized. PCA was performed to extract the primary component that best summarizes digital proficiency. In this case too, only the first principal component that incorporates the greatest proportion of the shared variance was retained. The indicators with higher index scores demonstrate increased proficiency in digital skills.

Control Variables

To isolate the effect of the key explanatory variables, a set of covariates commonly used in labor economics include Household size, Education, Marital status, Age and Gender. This comprehensive set of variables enables a nuanced analysis of how digital skills and inequality of opportunity relate to individual-level labor outcomes, while adequately controlling for confounding demographic and socioeconomic factors.

Methods

This study uses a quantitative statistical method based on data from the Life in Transition Survey IV (LITS-IV) to explore the relationship between digital transition and the inequality of opportunities in Kazakhstan. The analysis follows a structured methodology, incorporating descriptive statistics, regression modeling, and robustness checks to ensure reliable and meaningful findings.

In evaluating the relationship between digital inclusion and inequality of opportunities in this study, we utilized multiple regression models depending on the nature of the dependent variable.

Ordinary Least Squares (OLS) regression estimates the effects of inequality of opportunity and digital skills on individual income in Kazakhstan.

$$log_{income} = \beta^0 + \beta^1 * z_{miopi_{pca}} + \beta^2 * z_{digital\ skills_{pca}} + \beta^3 * hhsize + \beta^4 * edu + \beta^5 * married + \beta^6 * paid_{employment} + \beta^7 * working\ age + \varepsilon$$

Where,

$\log_{income}$ – the natural logarithm of individual income;

$z_{miopi_{pca}}$ - standardized indices of inequality of opportunity index;

$z_{digital_{skills_{pca}}}$ - standardized indices of digital skills;

$hhsize$ – household size;
edu – individual's education level;
$married$ – marital status;
$paid_{employment}$ - paid employment status
$working\ age$ – working age between 15 and 63
ε - Error term

This model evaluates the economic mobility of people who are estimated to have more access to the digital world as well as higher levels of digital skills.

Logistic regression is applied on binary respondents like, having internet access, participating in online lessons, or being formally employed. The respondent's probability of being digitally included is estimated based on her socioeconomic status:

$$logit(paid\_employment) = \beta 0 + \beta 1 * z_{digital_{skills_{pca}}} + \beta 2 * z_{miopi_{pca}} + \beta 3 * age + \beta 4 * edu + \beta 5 * gender + \beta 6 * married + \varepsilon$$

Where,

paid_employment is a binary outcome equal to 1 if individual *i* is in paid employment and 0 otherwise.

z_digital_skills_pca is a standardized index of digital skills from PCA.

z_miopi_pca is a standardized index of inequality of opportunity.

age is the age of the respondent.

*edu*is a binary indicator for having tertiary education.

gender is a binary variable (e.g., 1 for male, 0 for female).

*married*is a binary variable indicating marital status (1 if married).

β0 is the intercept term

ε is the error term.

This model determines whether socioeconomic status can explain the differences observed in digital skills and employment opportunities in the digital economy.

Limitations

While the theoretical framework provides considerable analytical value in examining how digitalization may exacerbate inequalities of opportunity in Kazakhstan, several notable limitations warrant explicit acknowledgement.

The most consequential constraints concern data availability and structure. Although the Life in Transition Survey IV (LITV-IV) continues a robust dataset for cross-national socio-economic comparison, its cross-sectional design fundamentally restricts the scope for causal inference. The absence of longitudinal data precludes any systematic tracking of how opportunity structures evolve or how digital skills acquisitions unfold over time, so a significant limitation given the dynamic nature of the phenomena under investigation.

The construction of both the Opportunity Inequality Index and the Digital Skills Index relies on Principal Component Analysis (PCA), a widely used dimensionality reduction technique that nonetheless carries inherent methodological limitations. First, interpretability remains a persistent challenge: principal components are statistical abstractions that do not necessarily correspond to theoretically meaningful constructs and relying solely on the first component risks oversimplifying the multidimensional social realities under study. Second, the arbitrary retention of a single component may discard substantively important variance captured by subsequent components, yet incorporating multiple components complicates empirical application interpretive clarity. Third, PCA operates under the assumption of linear relationships among input variables, as assumption that may inequality represent the non-linear processes underlying opportunity formation and skill development.

Empirical Research Findings

Table 1 Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
income	904	271462.39	286949.11	0	5000000
miopipca	974	0	1.309	-1.43	2.817
digital skills pca	1028	0	1.6	-2.56	3.201
hhsize	1028	2.76	1.524	1	10
edu	1028	.361	.48	0	1
working age	1028	.925	.263	0	1
married	1023	.384	.487	0	1
paid employment	736	.985	.121	0	1

Descriptive statistics furnish foundational insight into the reviewed population's structure in relation to income, digitalization, and employment. Widespread income inequality is demonstrated by the presence of negative income values, high income standard deviation, and some individuals existing within the zero income threshold. Digital skills are diverse, shaped by varying levels of access to technology, which may contribute to overarching socio-economic disparity, creating a digital divide. Families with low size and attainment levels are indicative of a larger systematically situated-structured-dynamically aspect of inequality of opportunity with concentration around the employment market, employment skills demand, and digital skills. There is a notable share of the population classified as of working age, the majority of whom are formally employed, though there is considerable heterogeneity in marital and family status. The latter provides ground for refined probing into the reasons that lie behind the systematic inequality of opportunity in Kazakhstan, especially in relation to digitalization and its potential effects on economic growth and development.

OLS Model (multiple regression)

The aim of this regression is to estimate the effect of inequality of opportunity (measured through z_miopi_pca) and digital skills (z_digital_skills_pca) on individual income levels, while controlling for family size (hhsize), education (edu), marital status (married), and employment status (paid_employment). The analysis is restricted to individuals of working age in Kazakhstan, using data from the Life in Transition Survey (LITS IV).

Table 2

Multiple Linear Regression output

VARIABLES	log_income
z_miopi_pca	0.0835***
	(0.0235)
z_digital_skills_pca	0.167***
	(0.0248)

hhsize	0.113***
	(0.0168)
edu	0.0984**
	(0.0484)
married	0.159***
	(0.0506)
paid_employment	0.516**
	(0.225)
Constant	11.44***
	(0.232)
Observations	620
R-squared	0.236

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The results indicate that Kazakhstan's income level is critically affected not only by the country's structural background factors, but also individual capabilities. The gap between income inequality of opportunity and digital skills is more pronounced and elusive under research. These results validate the necessity of impacts to revise policy designed to expand enrolled opportunities, especially those aimed for digital education and infrastructure for inherited access distinctions.

The presence and severity of **multicollinearity** is assessed using the Variance Inflation Factor (VIF), which measures the degree to which the estimated regression coefficient's variance is increased because of collinearity.The VIF test was conducted for all independent variables included in the model. The results are presented in table 3 below.

Table 3

```
. vif

    Variable |       VIF       1/VIF
-------------+----------------------
     married |      1.26    0.792755
      hhsize |      1.25    0.797122
         edu |      1.21    0.825971
  z_miopi_pca |      1.18    0.850504
z_digital_~a |      1.17    0.856202
paid_emplo~t |      1.03    0.969610
-------------+----------------------
    Mean VIF |      1.18
```

Table 3 illustrates that all VIFs are well below the cutoff's 5 or 10. Out of all regressors, the highest VIF is 1.26 while the average VIF is 1.18. These findings indicate the absence of

multicollinearity concerns in the model and minimal concern for variance inflation from the dependence of the explanatory variables on one another.

Thus, the regression model is valid and reliable in drawing conclusions on the impacts of predictors individually, while the model is examined for robustness against multicollinearity.

Logit Model

To understand the personal characteristics impacting an individual's participation in paid employment, a logistic regression was conducted using a sample of the working age population. The model's dependent variable is a binary variable that takes the value of 1 if the respondent is in paid employment and 0 otherwise. The main independent variables are highlighted with a standardized index of inequality of opportunity, a digital skills index, level of education, and marital status.The regression results are presented in Table 5.

Table 5

Logit Regression Results

	(1) paid_employment
Standardized values of miopi_pca	-0.590
	(0.321)
Standardized values of digital_skills_pca	0.734
	(0.424)
edu	2.395*
	(1.119)
married	-1.234
	(0.726)
Constant	6.870***
	(1.158)
Observations	696

Standard errors in parentheses
$^{*}p< 0.05$, $^{**}p< 0.01$, $^{***}p< 0.001$

The model fits well, obtaining likelihood ratio chi-square of 17.31 (p = 0.0017), which demonstrates the statistical significance of the entire model. The model also shows a pseudo R-squared of 0.18 which is good enough to suggest that percent of explained variance in paid employment log-odds is about 18% in cross-sectional microdata, typical from a singular point in time.

Digital skills, along with the perceived inequality of opportunity, need more attention to better explain employment outcomes in Kazakhstan. There is a need for more digital literacy "inclusive" economic participation to fairly address structural inequalities that hinder free access to work. Addressing the education coefficient within the regression output suggests further investigation via robustness checks or interaction effects by gender or region may be necessary. This is likely to yield more revealing outcomes.

To assess the **fitness of the logistic regression model**, a Pearson Chi-Square goodness-of-fit test was performed. The test indicates how well the predicted values of the model correlate with the observed outcomes and helps to decide if the model is a good fit for the data.

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. estat gof

Goodness-of-fit test after logistic model
Variable: paid_employment

      Number of observations =    696
Number of covariate patterns =    403
           Pearson chi2(398) = 284.00
                 Prob > chi2 = 1.0000
```

A consequence of having a p-value of 1.000 is that the model of logistic regression exactly fits the data. What this really says is that the predictions of the model are not wildly different from the observed outcomes. When explaining the Pearson chi-square test, a high p-value (close to 1) means that the model describes the relationships among the data with no hint of misfit.

Discussion of Findings

The results of the OLS and logistic regression models, together with their diagnostic checks, provide a comprehensive picture of how structural background factors and individual capabilities jointly shape income and employment in Kazakhstan. The following sections address each core finding in turn, situate it within the broader theoretical and empirical literature, and reflect on its implications for policy and future research.

Inequality of Opportunity and Income

The OLS regression results reveal that the standardized index of opportunity (z_miopi_pca) is positively and significantly associated with individual income at the 1% level (β=0.084), meaning that individuals who benefited from more advantaged family backgrounds, as proxied by parental education and occupation status, tend to earn systematically higher incomes in adulthood. This finding aligns with a substantial body of international evidence on intergenerational mobility. Roemer (1998) and Bourguignon, Ferreira, and Walton (2007) established that circumstances beyond and individual's control, particularly parental status, exert a durable influence on economic outcomes, even after controlling for individual effort and ability. In the post-Soviet context, Denisova (2012) documented persistent intergenerational transmission of advantage in transition economies, where institutional disruption paradoxically entrenched, rather than dissolved, inherited social hierarchies.

The magnitude of the effect, an approximate 8.4% income premium per one standard deviation increase in the opportunity index, is modest but economically meaningful, particularly given that the model already controls for education, marital status, household size, and employment status. This suggests that the intergenerational advantage operates through channels not fully captured by observable attainment variables alone. One plausible mechanism is social capital: individuals from higher status families may access more productive professional networks, receive better informal career guidance, or hold positions in sectors with higher wage premia (Lin, 2001). Another mechanism may be cognitive and non-cognitive skills formed in early childhood, which are not directly measured in the LITS-IV dataset. The persistence of this effect is consistent with Chetty et al. (2024), who found that early-life advantages compound over life course in ways that standard human capital variables cannot fully account for.

Digital Skills and Economic Outcomes

Perhaps the most substantively significant finding of this study is the strong, robust, and statistically significant positive effect of digital skills on income. A one standard deviation increase in the digital skills index (z_digital_skills_pca) is associated with a 16.7% increase in income (β= 0.167, $p<0.01$).

These results are consistent with a growing international literature documenting wage premium associated with digital competency. Authors, Levy, and Murnane (2003) established the foundational framework in which computerization increasingly complements high-skill, non-routine tasks while substituting for routine ones, driving a skill-biased technological change that rewards digitally proficient workers. More recently, Grundke et al. (2018), analyzing OECD economies, confirmed the workers with strong ICT skills earn substantially higher wages, with digital skills emerging as one of the strongest predictors of labor market success. For Kazakhstan specifically, the World Bank's Digital Economy for Kazakhstan initiative has highlighted the critical shortage of digital skills as a binding constraint on productivity and inclusive growth, and the present findings quantitatively corroborate this concern.

In the logistic model, the positive marginal effect of digital skills on employment probability (dy/dx=0.009, p+0.118) is directionally consistent but statistically weaker. This pattern suggests that the returns to digital skills in Kazakhstan operate primarily through wage quality rather that employment extensiveness.

One important implication of this finding concerns the compounding nature of digital and opportunity-related inequalities. If access to digital skills is itself systematically stratified by family background, a hypothesis supported by the distributional variation shown in the descriptive statistics, then the digital divide does not merely represent a separate dimension of inequality but actively amplifies pre-existing intergenerational disadvantages. This intersectionality between inequality of opportunity and digital exclusion warrants explicit attention in policy design.

Policy Implication and Recommendations

Policy Recommendations for Reducing Inequality

The findings of this study demonstrate that individual life outcomes in Kazakhstan remain substantially determined by inherited background circumstances, including parental educational attainment, childhood household conditions, and geographic origin. Although digital skills present a degree of potential to attenuate the reproduction of inherited disadvantages, both access to and competence in digital technologies continue to be unevenly distributed across the population. Drawing on these empirical insights, the following policy recommendations are advances with the aim of systematically reducing inequality of opportunity.

Addressing inequality at its structural roots necessitates prioritizing early intervention frameworks that provide targeted support to disadvantaged households. Concretely, this entails expanding access to quality early childhood education with particular emphasis on rural and low-income communities. Implementing parenting programs designed to foster early literacy and home-based learning environments; and introducing income support mechanisms or conditional cash transfer schemes directed at families with children living below the poverty threshold. Collectively, such measures have the potential to improve developmental outcomes for children irrespective of parental background, thereby attenuating the intergenerational transmission of disadvantage from the earliest stages of the life course.

While digitalization holds considerable potential to democratize access to information and learning, this potential is contingent on the inclusivity of the underlying infrastructure. Policy efforts should therefore be directed toward expanding high-speed internet coverage to remote and rural areas; providing subsidized digital devices for students and low-income households; and establishing public-private partnerships to develop affordable data plans and community-level Wi-Fi access points. Universal and equitable digital connectivity constitutes a structural prerequisite for ensuring that digital skills can function as a meaningful equalizing force in society.

The study reveals substantial variation in digital competencies across socio-economic groups, underscoring the need for a coordinated national digital literacy strategy. Such a strategy should incorporate integration of digital competence training across primary, secondary, and vocational education curricula; the provision of free or subsidized digital skills development programs for adults with particular attention to unemployed and underemployed populations; and the establishment of community learning centers capable of delivering both in-person and blended digital education tailored to local contexts and needs. These interventions would help ensure that Kazakhstan's broader digital transformation is socially inclusive and generate shared benefits across all population segments.

Finally, sustainable progress in reducing opportunity inequality requires that its systematic measurement be institutionalized as an integral component of the national social policy agenda. This demands the regular collection and public dissemination of disaggregated data on educational, labor market, and digital outcomes stratified by region, gender, and socio-economic background; sustained support for independent and academic research on long-term social mobility and digital inclusion; and the embedding of opportunity-sensitive metrics into the evaluation frameworks of public programs. Without consistent and rigorous monitoring of distributional outcomes, policymakers lack the evidential basis necessary to assess progress and refine policy responses accordingly,

Reducing inequality of opportunity in Kazakhstan demands a comprehensive, multi-sectoral policy framework that simultaneously addresses the traditional structural drivers of inequality and the emerging dimensions of the digital divide. The recommendations advanced above are oriented toward fostering a more equitable society, one in which individual outcomes are increasingly determined by personal effort and capability rather than by the socio-economic circumstances of birth.

Future Research Directions

While this study offers meaningful insights into the relationship between opportunity inequality and digitalization in Kazakhstan, it also points toward several important directions for future inquiry. As digital technologies continue to reshape economic and social life at an accelerating pace, deeper and more comprehensive investigation is needed to track these transformations and their broader implications for equity and inclusion.

One of the most pressing limitations of the present study is its reliance on cross-sectional data, which contains the ability to observe how opportunity evolves over time or how disadvantages experienced early in life carry through into adult outcomes. Future research would benefit greatly from incorporating longitudinal or panel data, enabling researchers to follow individuals across different life stages and draw more robust conclusions. This kind of approach would shed light on patterns of intergenerational mobility, reveal the persistence of inequality across generations, and help determine whether digital skills acquired at one point in life continue to yield meaningful

returns later on. Crucially, it would also allow for stronger causal claims about how digitalization shapes opportunity trajectories.

A further concern relates to how digital skills are measured In this study, digital competence is captured through self-reported data, which carries an inherited risk of bias because people may overestimate or underestimate their own abilities depending on confidence, awareness, or social desirability. Future studies could address this by drawing on objective, performance-based assessments, such as task-based evaluations or digital simulations that measure what people can do rather than what they believe they can do. Complementing survey data with administrative records or behavioral data tracking real-world digital engagement would further strengthen the validity of findings and offer clearer evidence on the links between digital competence and opportunity inequality.

Although this study is grounded in the Kazakhstani context, the dynamics of opportunity inequality and digitalization are global phenomena with important regional variations. Future research could explore these questions through a comparative lens, examining how similar patterns play out across Central Asia, the broader post-Soviet space, or other developing economies with comparable institutional and structural characteristics. Such comparisons would help identify which features of the relationship between background circumstances and outcomes are context-specific and which reflects more universal dynamics. They would also offer practical insights into what works and what does not when it comes to tracking digital inequality and promoting inclusive growth.

Taken together, these research directions represent an important agenda for advancing both scholarly understanding and evidence-based policymaking in the context of Kazakhstan's ongoing digital and social transformation. By embracing comparative perspectives and engaging seriously with labor market dynamics, future studies can play a meaningful role in shaping a more inclusive digital future.

Conclusion

This study set out to examine how inequality of opportunity and digital competencies shape income levels and labor market participation in Kazakhstan, with particular attention to whether digital inclusion can help individuals overcome the disadvantages associated with their background circumstances. The findings offer both empirical contributions and practical implications for policy in a region that remains underrepresented in the global literature on inequality and digital development. The study created two indices: an Inequality of Opportunity Index and a Digital Skills Index, both of which were constructed through PCA methodology. These indices were utilized as primary independent variables for the poverty and employment level analysis conducted on the individual’s income data.

The descriptive statistics revealed that the income disparities were significantly large, which was accompanied with high standard deviation as well as an income range of zero to millions.

There is evidence of both relative poverty and affluence coexisting in the labor market. The results of the regression analysis conducted also pointed out that with respect to the index constructed by PCA, the inequality of opportunity considerably impacts income is found meaningful statistically. An increase of one standard deviation in the opportunity index results in an income increase of 8.35% when everything else is held constant," this reinforces core family factors of backgrounds and education, showing the entrenching impact of family on the economy and family upbringing features like parental schooling, birth location, and early setting of residence. Together, we corroborate existing claims on growing inequality condition for opportunity reference the Roemer (1998) captured opportunity inequality literature.

As adopted globally, this has consequences for Kazakhstan where simultaneously undergoing economic transition coupled with blooming its digital transformation put a still-sustained disadvantage stemming from childhood formative years on structure income earning capabilities. Action proves policies on diminished income inequality require deeper than adult job market and intervention approach and instead target underlying form at unequal predestined origins headstart inequality.

Not only inequality of opportunity capture, possessing its free form powerful predictor ontop skills does remarkable work on income digits. As regression evaluation captures these people calculate that along increased possession goes 16.7increase in income, this underpins economic inclusion, showing people's digital linguistic abilities join the across board literacy dominating tool of today" serving as crucial component inclusion."

The results confirm that inequality of opportunity continues to pose a formidable barrier to inclusive development in Kazakhstan. Background circumstances like parental education, childhood household, and place of birth retain a significant influence over individual life outcomes, suggesting that the playing field remains far from level. At the same time, the findings indicate that digital skills can function as a partial equalizing force, improving both income prospects and the likelihood of labor market participation. Yet this should not be mistaken for a comprehensive solution. Digital inclusion, on its own, is insufficient to dismantle structural disadvantage; it must instead be embedded within a broader policy agenda that addresses educational equity, economic opportunity, and institutional fairness in a coordinated and sustained manner.

This research makes several distinct contributions to existing scholarship. First, it provides empirical evidence from a Central Asian transition economy, a context that remains underrepresented in global inequality research, thereby enhancing the comparative literature and offering insights relevant to similarly positioned countries. Second, it applies a PCA-based measurement framework to capture both opportunity inequality and digital skills as multidimensional constraints, offering methodologically transparent and replicable approach for future research. Third, it demonstrates the independent and substantively significant role of digital competencies in both income generation and employment access, reinforcing the centrality of digital literacy in development policy discourse, Fourth, and perhaps most importantly, it bridges the conceptual divide between structural inequality and individual agency expressed through

acquired digital capabilities, highlighting how inherited conditions and personal development interact to shape life trajectories.

The findings support a coherent set of policy priorities. Investments in early childhood education, parental support programs, and regional equity in school quality are essential first steps toward reducing the reproduction of inherited disadvantage. Targeted digital skills training, with particular attention to women, rural populations, and individuals from low-income households, can strengthen labor market competitiveness and build economic resilience among those most at risk of exclusion. Universal and affordable access to digital infrastructure must be recognized as a public good and pursued accordingly, rather than left to market forces alone. Finally, institutionalization of opportunity inequality monitoring through standardized indices should be integrated into Kazakhstan's national statistical architecture, providing the evidential foundation necessary for ongoing, evidence-based policy evaluation and reform.

The study has its limitations. The cross-sectional nature of data precludes causal inference and limits the capacity to observe how opportunity structures and digital skills returns evolve over time. Self-reported measures of digital competence introduce the possibility of systematic bias, and the exclusive focus on Kazakhstan constrains the generalizability of the findings. Future research would benefit from panel data design capable of tracking individuals across life-stages, objective and performance-based assessments of digital skills, and comparative analyses across economies with similar structural and institutional characteristics.

In sum, this research reaffirms that inequality of opportunity remains one of the most pressing structural challenges facing Kazakhstan's development trajectory. Digital skills offer a meaningful pathway toward greater equity, improving income outcomes and expanding employment access for those who possess them. However, they are not a substitute for the deeper structural reforms that inclusive development ultimately requires. As Kazakhstan navigates it continued digital and economic transformation, policies that simultaneously expand access, build capabilities, and address root causes of inequality will be indispensable to ensuring that the benefits of progress are shared broadly, and that no one is k=left behind the digital age.

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ЭФФЕКТИВНОСТЬ СИСТЕМЫ ОБЯЗАТЕЛЬНОГО СОЦИАЛЬНОГО МЕДИЦИНСКОГО СТРАХОВАНИЯ В КАЗАХСТАНЕ: СОВРЕМЕННОЕ СОСТОЯНИЕ, ПРОБЛЕМЫ И НАПРАВЛЕНИЯ РАЗВИТИЯ

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АННОТАЦИЯ

В статье проведён комплексный анализ эффективности системы обязательного социального медицинского страхования (ОСМС) в Республике Казахстан на современном этапе. Исследование охватывает финансовые, институциональные и социальные аспекты функционирования системы, включая динамику финансирования, уровень охвата населения, качество медицинских услуг, проблему личных расходов домохозяйств и риски неэффективного использования средств. Особое внимание уделено противоречию между ростом ресурсов системы и сохраняющимися проблемами доступности и качества медицинской помощи. На основе статистических данных 2024-2025 годов, материалов Фонда социального медицинского страхования, международных подходов к оценке эффективности здравоохранения и сравнительного анализа зарубежного опыта сформулированы направления дальнейшего развития ОСМС. Сделан вывод, что ключевым условием повышения результативности является не только увеличение финансирования, но и усиление контроля, цифровизация, прозрачность финансовых потоков, расширение охвата и переход к оценке медицинской помощи по конечным результатам для пациента.

КЛЮЧЕВЫЕ СЛОВА

обязательное социальное медицинское страхование, ОСМС, Казахстан, здравоохранение, финансирование, эффективность, качество медицинской помощи, цифровизация.

1. ВВЕДЕНИЕ

Здравоохранение является одной из наиболее значимых сфер государственной политики, поскольку состояние здоровья населения напрямую влияет на качество человеческого капитала, производительность труда и устойчивость социально-экономического развития. В условиях роста медицинских расходов, увеличения распространенности хронических заболеваний и повышения ожиданий населения государствам необходимо искать такие модели финансирования, которые позволяют одновременно обеспечивать доступность медицинской помощи и сохранять устойчивость публичных финансов.

В Казахстане одним из ключевых направлений реформирования отрасли стало внедрение системы обязательного социального медицинского страхования. ОСМС была запущена в полном объеме с 2020 года и стала попыткой перейти от преимущественно бюджетной модели к смешанному механизму, при котором финансовая ответственность распределяется между государством, работодателями, работниками и отдельными категориями самостоятельно занятых граждан. По замыслу реформы, такой подход должен был расширить финансовую базу здравоохранения и повысить доступность медицинской помощи.

Актуальность темы обусловлена тем, что за годы функционирования ОСМС объем финансирования здравоохранения существенно вырос, однако общественная оценка системы остается неоднозначной. Пациенты продолжают сталкиваться с очередями, отказами в получении отдельных услуг, недостатком лекарственного обеспечения и неравномерным качеством медицинской помощи. Следовательно, простое увеличение финансовых ресурсов не решает автоматически проблему эффективности системы.

Научная значимость исследования заключается в необходимости рассматривать ОСМС не только как финансовый механизм, но и как сложную институциональную систему. Ее результативность зависит от правил взаимодействия участников, стимулов медицинских организаций, качества цифровой инфраструктуры, прозрачности движения средств и способности государства предотвращать неэффективные расходы. Именно эти факторы определяют, превращаются ли страховые взносы и бюджетные трансферты в реальные улучшения для пациента.

Цель статьи - оценить эффективность системы ОСМС в Казахстане с точки зрения финансовой устойчивости, охвата населения, качества медицинской помощи и институциональных ограничений. Для достижения цели рассматриваются этапы становления системы, анализируются ключевые статистические показатели, выявляются основные проблемы и предлагаются направления развития с учетом международного опыта.

Методологически статья опирается на анализ открытых статистических данных, нормативно-институциональный подход, элементы сравнительного анализа и интерпретацию показателей эффективности через призму экономики здравоохранения. Такой подход позволяет оценить не только формальные результаты реформы, но и причины сохраняющихся дисфункций.

2. ТЕОРЕТИЧЕСКИЕ ПОДХОДЫ К ОЦЕНКЕ ЭФФЕКТИВНОСТИ МЕДИЦИНСКОГО СТРАХОВАНИЯ

В мировой практике выделяют несколько базовых моделей финансирования здравоохранения. Бюджетная модель, часто ассоциируемая с подходом Бевериджа, опирается преимущественно на налоговые поступления и предполагает значительную роль государства в планировании и предоставлении медицинской помощи. Страховая модель, или модель Бисмарка, строится на обязательных взносах работников и работодателей, а

медицинская помощь финансируется через страховые фонды. Многие современные системы являются смешанными и сочетают элементы обеих моделей.

Казахстанская система ОСМС относится к смешанному типу. С одной стороны, государство продолжает финансировать гарантированный объем бесплатной медицинской помощи и оплачивает взносы за социально уязвимые категории. С другой стороны, работники, работодатели и часть самостоятельных плательщиков участвуют в формировании страхового пула. Такая конструкция потенциально позволяет увеличить ресурсную базу, однако одновременно усложняет администрирование и контроль.

Эффективность страховой системы нельзя оценивать только по объему собранных средств. Более важными являются показатели финансовой защиты населения, реальной доступности услуг, качества лечения, удовлетворенности пациентов и рациональности расходов. Международные организации, включая Всемирную организацию здравоохранения и ОЭСР, подчеркивают, что высокий уровень расходов на здравоохранение сам по себе не гарантирует лучших результатов, если система управления не обеспечивает прозрачности и ответственности.

С позиции институциональной экономики система медицинского страхования сталкивается с рядом типичных рисков. Первый риск - информационная асимметрия: медицинская организация знает больше о состоянии пациента и необходимости процедур, чем страховой фонд или государственный регулятор. Второй риск - моральный риск, когда участники системы могут изменять поведение из-за того, что расходы покрываются третьей стороной. Третий риск - агентская проблема, при которой интересы поставщиков услуг, пациентов и государства не полностью совпадают.

В условиях слабого контроля эти риски могут проявляться в завышении объемов услуг, формальном исполнении показателей, приписках и нерациональном использовании средств. Поэтому эффективная система ОСМС должна иметь не только устойчивое финансирование, но и развитые механизмы мониторинга, аудита, цифровой идентификации услуг, оценки качества и обратной связи с пациентами.

Для Казахстана теоретическая проблема эффективности особенно актуальна из-за сочетания нескольких факторов: большой доли льготных категорий, неформальной занятости, регионального неравенства медицинской инфраструктуры и необходимости интегрировать данные между разными информационными системами. Поэтому оценка ОСМС должна включать финансовое, социальное и управленческое измерения.

3. ИСТОРИЧЕСКИЕ ПРЕДПОСЫЛКИ И ЭТАПЫ РАЗВИТИЯ ОСМС В КАЗАХСТАНЕ

Идея страховой медицины в Казахстане имеет более раннюю историю, чем запуск действующей модели ОСМС. Первая попытка внедрения обязательного медицинского страхования предпринималась в 1990-е годы, однако в условиях экономической нестабильности, слабой институциональной базы и недостаточной готовности

администрирования система не смогла устойчиво функционировать. Этот опыт показал, что страховая модель требует не только законодательной базы, но и развитых механизмов сбора взносов, учета населения и контроля расходов.

В последующие годы Казахстан преимущественно использовал бюджетную модель финансирования здравоохранения. Государство финансировало медицинские услуги через бюджетные программы, однако такая модель сталкивалась с ограничениями, связанными с недостаточным объемом ресурсов, зависимостью от бюджетного цикла и слабой мотивацией поставщиков к повышению качества услуг. Постепенно возникла необходимость расширить источники финансирования и создать более устойчивый механизм.

Новый этап реформ начался после принятия законодательства об обязательном социальном медицинском страховании в середине 2010-х годов. С 2017 года стартовало формирование финансовой базы через сбор отчислений, а с 2020 года система была введена в полном объеме. Важной особенностью стало то, что внедрение совпало с периодом пандемии COVID-19, когда здравоохранение испытывало чрезвычайную нагрузку и одновременно нуждалось в устойчивом финансировании.

Период 2020-2022 годов можно рассматривать как стресс-тест для ОСМС. Система позволила аккумулировать дополнительные ресурсы, но также выявила проблемы координации, управления потоками пациентов, доступности отдельных видов помощи и качества цифровых решений. В 2023-2025 годах внимание постепенно сместилось от запуска системы к оценке ее эффективности и устранению выявленных дисбалансов.

На современном этапе ключевой вопрос заключается не в том, нужна ли Казахстану страховая модель, а в том, насколько действующая система способна обеспечить финансовую защиту граждан, устойчивость медицинских организаций и реальное повышение качества помощи. Ответ на этот вопрос требует анализа финансовых параметров, охвата населения и институциональных ограничений.

4. ФИНАНСОВАЯ ДИНАМИКА И СТРУКТУРА ФИНАНСИРОВАНИЯ

Одним из наиболее заметных результатов внедрения ОСМС стал рост финансирования здравоохранения. По данным открытых источников, объем средств, направляемых на отрасль, увеличился с примерно 1 трлн тенге в 2019 году до около 3 трлн тенге в 2025 году. Такой рост отражает политический приоритет здравоохранения и стремление государства усилить финансовую базу медицинской помощи.

В 2025 году общий объем средств, которыми располагала система Фонда социального медицинского страхования, оценивался более чем в 3 трлн тенге. Существенную часть поступлений формирует государство, оплачивающее взносы за льготные категории населения и финансирующее гарантированный объем медицинской помощи. Дополнительную часть составляют отчисления работодателей, взносы работников и платежи отдельных категорий самостоятельных плательщиков.

Финансовая структура ОСМС отражает принцип солидарности: экономически активное население участвует в формировании пула, а государство поддерживает социально уязвимые группы. Однако такая модель требует высокой платежной дисциплины и точного учета статуса граждан. Если значительная часть населения не платит взносы и одновременно не относится к льготным категориям, система теряет часть доходной базы и сталкивается с проблемой неполного охвата.

Рост финансирования является положительным фактором, но он не может рассматриваться как единственный критерий успеха. Важнее оценить, насколько эффективно ресурсы превращаются в услуги для пациентов. Если увеличение расходов сопровождается очередями, жалобами и приписками, то система демонстрирует не финансовый, а управленческий дефицит. В этом смысле ОСМС нуждается в переходе от логики освоения средств к логике оценки результата.

Отдельного внимания требует проблема личных расходов населения. Если граждане продолжают оплачивать значительную часть медицинских услуг из собственного кармана, страховая система не выполняет в полной мере функцию финансовой защиты. Международная практика показывает, что высокая доля прямых платежей домохозяйств может ограничивать доступ к помощи, особенно для людей с низкими доходами и хроническими заболеваниями.

Финансовая устойчивость также зависит от прогнозируемости поступлений и расходов. Недобор взносов, задолженность медицинских организаций и несвоевременное финансирование отдельных направлений могут приводить к сбоям в оказании помощи. Поэтому бюджетирование ОСМС должно быть связано с долгосрочным прогнозированием демографических и эпидемиологических рисков.

5. ОХВАТ НАСЕЛЕНИЯ И СОЦИАЛЬНАЯ СПРАВЕДЛИВОСТЬ

Охват населения является одним из центральных показателей эффективности обязательного медицинского страхования. По официальным сообщениям конца 2025 года, в системе ОСМС были застрахованы около 16,9 млн человек, что составляло примерно 82,6% населения страны. Из них около 12 млн человек относились к льготным категориям, за которых взносы уплачивает государство.

Несмотря на высокий формальный показатель, около 3,4 млн человек оставались вне системы. Это означает, что принцип всеобщности реализован не полностью. Наличие значительной группы незастрахованных граждан создает риск неравного доступа к медицинской помощи и снижает устойчивость страхового пула, поскольку часть населения не участвует в финансировании системы.

Причины неполного охвата связаны не только с нежеланием граждан платить взносы. Важную роль играет структура рынка труда, где сохраняется неформальная занятость, нестабильные доходы, сезонная работа и отсутствие регулярных социальных платежей. Для

таких групп действующие механизмы администрирования могут быть сложными или недостаточно понятными.

Неполный охват имеет и социальные последствия. Человек, не имеющий статуса застрахованного, может откладывать обращение к врачу, обращаться за платными услугами или ограничиваться минимальным набором помощи. Это повышает риск поздней диагностики заболеваний, увеличивает нагрузку на экстренную медицину и в долгосрочной перспективе может приводить к более высоким расходам системы.

Решение проблемы охвата требует не только административного давления, но и гибких механизмов вовлечения. Важно развивать понятные цифровые сервисы проверки статуса, упрощать платежи, проводить адресную информационную работу и учитывать особенности самозанятых граждан. Только при расширении фактического охвата ОСМС сможет выполнять функцию социальной солидарности.

6. ДОСТУПНОСТЬ И КАЧЕСТВО МЕДИЦИНСКОЙ ПОМОЩИ

Одной из целей ОСМС было расширение доступа граждан к медицинским услугам, включая консультационно-диагностическую помощь, специализированные услуги и высокотехнологичные виды лечения. В количественном выражении система действительно способствовала росту объема оказываемых услуг и расширению участия частных медицинских организаций в закупе помощи.

Однако доступность не должна измеряться только числом оплаченных услуг. Для пациента важны сроки ожидания, возможность получить направление, наличие специалистов, обеспеченность лекарствами и качество коммуникации с медицинской организацией. Если услуга формально доступна, но фактически ее приходится ждать месяцами или получать через дополнительные платные обращения, эффективность системы снижается.

Данные о жалобах пациентов показывают, что проблема качества остается существенной. По итогам 2025 года в систему ФСМС поступило 23 022 жалобы, причем значительная часть касалась качества медицинской помощи, отказов в оказании услуг и лекарственного обеспечения. Эти показатели указывают на сохраняющийся разрыв между финансовым ростом системы и пациентским опытом.

Качество медицинской помощи зависит от нескольких факторов: профессиональной подготовки кадров, стандартов лечения, оснащенности организаций, мотивации поставщиков и контроля со стороны плательщика. Если оплата строится преимущественно вокруг количества услуг, медицинские организации могут быть заинтересованы в увеличении объема, но не обязательно в улучшении результата лечения.

Поэтому дальнейшее развитие ОСМС должно включать переход к оценке качества по результатам. Это может предполагать использование индикаторов повторной госпитализации, осложнений, удовлетворенности пациентов, соблюдения клинических

протоколов и времени ожидания. Без такой системы страховая модель рискует оставаться механизмом оплаты процедур, а не инструментом улучшения здоровья населения.

Особенно важна региональная дифференциация. В крупных городах выбор поставщиков шире, а доступ к диагностике выше, тогда как сельские и отдаленные территории сталкиваются с дефицитом кадров, оборудования и транспортной доступности. Поэтому единые финансовые правила должны сочетаться с адресной политикой выравнивания региональных различий.

7. ПРОБЛЕМА ПРИПИСОК, ДВОЙНОГО ФИНАНСИРОВАНИЯ И КОНТРОЛЯ

Одной из наиболее острых проблем ОСМС являются приписки и фиктивное завышение объемов оказанных медицинских услуг. Под приписками понимается отражение в информационных системах услуг, которые фактически не были оказаны пациенту, были оказаны в меньшем объеме или оформлены с нарушением реального медицинского маршрута.

Такая практика опасна не только финансовыми потерями. Она искажает статистику, мешает планированию, формирует неверное представление о потребности населения и снижает доверие к системе. Если в отчетности отражается высокий объем помощи, а пациенты фактически жалуются на недоступность услуг, возникает управленческий парадокс: система выглядит результативной на бумаге, но неэффективной в реальности.

Причины приписок связаны с несовершенством стимулов. Когда финансирование поставщика зависит от объема услуг, возникает риск искусственного увеличения количества записей. При слабом контроле и недостаточной интеграции данных медицинская организация может получить оплату за услугу, которую пациент не подтверждал или не получал.

Отдельной проблемой является двойное финансирование, когда одни и те же или сходные услуги оплачиваются через разные каналы, например через ОСМС и добровольное медицинское страхование. Это свидетельствует о недостаточной координации между источниками оплаты и слабой прозрачности финансовых потоков.

Для снижения таких рисков необходимы антифрод-механизмы. Они должны включать автоматическое выявление аномалий, подтверждение услуги пациентом через цифровые сервисы, сопоставление медицинских записей с фактическим посещением, анализ нетипичных объемов назначений и регулярный риск-ориентированный аудит. Контроль должен быть не постфактум, а встроенным в систему оплаты.

8. МЕЖДУНАРОДНЫЙ ОПЫТ И СРАВНИТЕЛЬНЫЙ АНАЛИЗ

Опыт стран с развитыми системами медицинского страхования показывает, что эффективность зависит не только от модели финансирования, но и от качества

администрирования. Германия, Эстония и Южная Корея демонстрируют разные подходы, но их объединяют высокий уровень контроля, развитая цифровая инфраструктура и ориентация на прозрачность.

Германия является классическим примером страховой модели. Система основана на обязательном участии населения, деятельности страховых фондов и строгом регулировании тарифов и качества. Важным элементом является то, что страховые механизмы сочетаются с развитой системой профессионального контроля и понятным распределением ответственности между участниками.

Эстония представляет интерес как страна с высокой степенью цифровизации здравоохранения. Электронные медицинские карты, электронные рецепты и интегрированные базы данных позволяют отслеживать оказанные услуги и снижать риски дублирования. Для Казахстана этот опыт особенно актуален, поскольку проблема приписок и слабой связности данных остается одной из ключевых.

Южная Корея использует централизованную модель национального медицинского страхования, которая обеспечивает почти полный охват населения. Важную роль играет анализ данных, контроль расходов и постоянная корректировка тарифов. Такой подход показывает, что масштабная страховая система может быть эффективной при наличии сильного аналитического центра и дисциплины поставщиков.

Сравнительный анализ позволяет сделать вывод: успешные системы не ограничиваются сбором взносов. Они создают инфраструктуру доверия, где пациент может проверить свои услуги, фонд видит реальные данные, а медицинская организация понимает неизбежность контроля. Казахстану важно адаптировать эти элементы с учетом собственной структуры занятости, региональных различий и уровня цифровой зрелости медицинских организаций.

9. КЛЮЧЕВЫЕ ВЫВОДЫ И НАУЧНАЯ ИНТЕРПРЕТАЦИЯ

Проведенный анализ показывает, что основная проблема ОСМС в Казахстане имеет не только финансовый, но и институциональный характер. Рост расходов на здравоохранение создал дополнительные возможности для расширения медицинской помощи, однако существующие механизмы управления не всегда обеспечивают превращение ресурсов в качественный результат.

Первый ключевой вывод заключается в наличии разрыва между формальной доступностью и фактическим пациентским опытом. Система может оплачивать большое количество услуг, но если пациент сталкивается с очередями, отказами и недостатком лекарств, эффективность остается ограниченной. Это означает, что показатели объема должны быть дополнены индикаторами качества и результата.

Второй вывод связан с искажением стимулов. При оплате по объему поставщик заинтересован в увеличении количества услуг, а не всегда в достижении медицинского

результата. В таких условиях приписки и завышение объемов становятся не случайным отклонением, а следствием неверно настроенной модели мотивации.

Третий вывод касается доверия. Для страховой системы доверие является критически важным ресурсом. Гражданин должен понимать, за что он платит, какие услуги ему доступны и как он может защитить свои права. Если население воспринимает ОСМС как дополнительный платеж без гарантированного улучшения доступа, легитимность системы снижается.

Таким образом, дальнейшая реформа должна быть направлена не на механическое увеличение бюджета, а на изменение архитектуры управления. Необходимо связать финансирование с результатами, усилить цифровую прослеживаемость услуг, обеспечить прозрачность данных и создать механизмы ответственности поставщиков.

10. НАПРАВЛЕНИЯ СОВЕРШЕНСТВОВАНИЯ ОСМС

Первым направлением является цифровизация контроля. Каждая оплаченная услуга должна быть связана с конкретным пациентом, медицинской записью, датой обращения и подтверждением факта оказания помощи. Это позволит снизить риск фиктивных записей и повысить качество данных для планирования.

Вторым направлением является внедрение антифрод-аналитики. Система должна автоматически выявлять аномалии: необычно высокий объем услуг у отдельной организации, повторяющиеся назначения, услуги пациентам без подтвержденного посещения, резкие отклонения от средних показателей по региону. Такие инструменты уже используются в развитых страховых системах.

Третьим направлением является переход к оплате за результат. Это не означает отказ от оплаты услуг, но предполагает включение показателей качества: соблюдение клинических протоколов, снижение осложнений, сокращение повторных обращений, удовлетворенность пациентов и своевременность оказания помощи. В долгосрочной перспективе такая модель формирует более правильные стимулы.

Четвертым направлением является расширение охвата населения. Для самозанятых и граждан с нестабильными доходами нужны более гибкие и понятные механизмы участия. Важно не только требовать платежей, но и объяснять преимущества страхового статуса, упрощать цифровые платежи и сокращать административные барьеры.

Пятым направлением является повышение прозрачности. Фонд и медицинские организации должны публиковать понятные данные о закупе услуг, жалобах, результатах контроля и принятых мерах. Открытость позволит повысить доверие общества и усилить общественный контроль за расходованием средств.

11. ЗАКЛЮЧЕНИЕ

Система обязательного социального медицинского страхования стала важным этапом реформирования здравоохранения Казахстана. Она позволила расширить финансовую базу

отрасли, увеличить объем оказываемых услуг и создать предпосылки для более устойчивой модели финансирования.

Вместе с тем анализ показывает, что эффективность ОСМС ограничивается рядом системных проблем. К ним относятся неполный охват населения, высокая доля личных расходов, неравномерное качество медицинской помощи, приписки, двойное финансирование и недостаточная прозрачность финансовых потоков.

Главный вывод исследования состоит в том, что дальнейшее развитие ОСМС должно быть ориентировано не только на рост финансирования, но и на повышение качества управления. Без институциональных реформ дополнительные средства могут не привести к заметному улучшению пациентского опыта.

Перспективы развития системы связаны с цифровизацией, антифрод-контролем, расширением охвата, повышением прозрачности и переходом к оплате за результат. Именно эти меры способны превратить ОСМС из механизма распределения средств в полноценный инструмент повышения качества и доступности медицинской помощи.

Таким образом, эффективность ОСМС в Казахстане зависит от способности государства и участников системы перейти от количественной логики к модели, ориентированной на результат, доверие и здоровье населения.

Таблица 1 - Динамика финансирования здравоохранения в Казахстане

Год	Оценочный объем финансирования	Комментарий
2019	около 1,0 трлн тенге	период до полноценного запуска ОСМС
2021	около 2,0 трлн тенге	рост расходов на фоне пандемийной нагрузки
2023	около 2,6 трлн тенге	этап стабилизации модели
2025	около 3,0 трлн тенге	увеличение бюджета отрасли почти в 3 раза к 2019 году

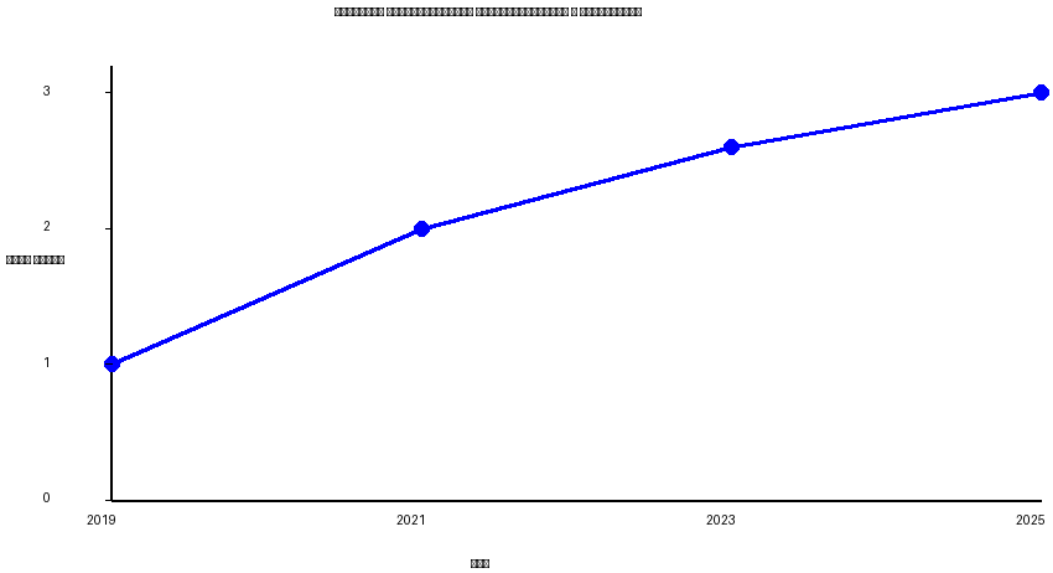
Источник: составлено автором по открытым данным Минздрава РК и ФСМС.

Таблица 2 - Ключевые индикаторы ОСМС на современном этапе

Показатель	Значение	Интерпретация
Застрахованные граждане	16,9 млн человек	примерно 82,6% населения
Льготные категории	около 12 млн человек	взносы оплачиваются государством
Незастрахованные граждане	около 3,4 млн человек	основная проблема охвата
Жалобы в ФСМС за 2025 год	23 022	индикатор проблем качества и доступности

Источник: составлено автором по сообщениям ФСМС и открытым статистическим материалам.

Рисунок 1 - Динамика финансирования здравоохранения



Источник: составлено автором на основе открытых данных за 2019-2025 годы.

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ПРИЛОЖЕНИЕ А - ПРАКТИЧЕСКАЯ МАТРИЦА РЕФОРМИРОВАНИЯ ОСМС

Для практической реализации предложенных направлений важно разделить реформы на краткосрочные, среднесрочные и долгосрочные меры. Краткосрочный блок должен быть связан с устранением наиболее очевидных нарушений: проверкой сомнительных объемов услуг, усилением контроля за повторяющимися случаями приписок и внедрением механизма подтверждения оказанной услуги со стороны пациента.

Среднесрочные меры должны быть направлены на изменение системы стимулов. Если медицинская организация получает оплату преимущественно за количество услуг, то она объективно заинтересована в расширении объема процедур. Поэтому часть финансирования целесообразно связывать с качественными индикаторами, такими как своевременность помощи, соблюдение клинических протоколов, снижение повторных госпитализаций и уровень удовлетворенности пациентов.

Долгосрочная задача заключается в формировании единой цифровой экосистемы здравоохранения. Такая экосистема должна объединять данные о статусе застрахованности, маршруте пациента, назначениях, рецептах, фактическом посещении и оплате услуг. Чем выше связность данных, тем ниже вероятность дублирования, ошибок и финансовых злоупотреблений.

Особое значение имеет развитие пациентского контроля. Гражданин должен иметь возможность видеть перечень услуг, оплаченных за него через ОСМС, и при необходимости подтвердить или оспорить факт их оказания. Такая функция повышает прозрачность системы и превращает пациента из пассивного получателя помощи в участника общественного контроля.

Для регионов с низкой доступностью медицинской помощи требуется отдельный механизм поддержки. Универсальные тарифы и одинаковые правила оплаты не всегда учитывают различия между крупными городами, малонаселенными районами и сельскими территориями. Поэтому реформы ОСМС должны сочетаться с кадровой политикой, развитием телемедицины, транспортной доступности и обновлением инфраструктуры первичной помощи.

Таблица 3 - Матрица предлагаемых мер по повышению эффективности ОСМС

Направление	Проблема	Предлагаемая мера	Ожидаемый результат
Цифровой контроль	приписки и фиктивные услуги	подтверждение услуги пациентом и анализ аномалий	снижение необоснованных выплат
Охват населения	незастрахованные граждане	упрощение платежей и адресная	расширение страхового пула

		работа с самозанятыми	
Качество помощи	жалобы и отказы	привязка части оплаты к индикаторам результата	рост удовлетворенности пациентов
Прозрачность	низкое доверие	публикация понятных отчетов о расходах и жалобах	повышение общественного контроля
Региональная доступность	неравенство между регионами	поддержка первичной помощи, телемедицина и кадровые стимулы	сокращение территориальных дисбалансов

Источник: разработано автором.

Предложенная матрица показывает, что повышение эффективности ОСМС требует не одной отдельной меры, а согласованного набора управленческих решений. Если цифровизация будет внедряться без изменения стимулов, она может превратиться только в дополнительный учет. Если же контроль будет усиливаться без повышения качества услуг, это не приведет к росту доверия населения. Поэтому реформа должна быть комплексной.

Итоговая логика развития ОСМС должна строиться вокруг пациента. Финансовые механизмы, тарифы, цифровые сервисы и контрольные процедуры имеют смысл только в том случае, если они обеспечивают своевременную, качественную и справедливую медицинскую помощь. Именно такой подход позволит повысить результативность системы и укрепить ее общественную легитимность.

Status Quo"

Behind the Grades: The Association of Anxiety and Depressive Traits with Semester GPA Among Kazakhstani University Students

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This study examines whether trait anxiety and depressive features predict semester Grade Point Average (GPA) and dropout risk among university students in Kazakhstan. Using a longitudinal quantitative design with prospective follow up, nearly 150 undergraduate and master's students at a private Kazakhstani university will complete the STAI-T, the MTSD, and demographic items. Semester GPA and enrollment status will be collected, preferably, from official university records with student consent. Follow-up subsample of 50 students will be tracked to strengthen longitudinal inference. The variable choice is based on the difference between stable traits and temporary states: trait anxiety reflects more stable tendency to experience anxiety across situations and is theoretically linked to reduced attentional control and cognitive efficiency. The MTSD captures both state and trait aspects of depression, reflecting both current symptoms and more lasting depressive tendencies.

The study will test whether trait anxiety and depressive features predict GPA and dropout after controlling for age, gender, and academic workload. In addition, anxiety and depressive symptoms often occur together, and this comorbidity may have a stronger negative influence on academic achievement because it can affect both cognitive and motivational processes.

Introduction

The proposed study will examine the relationship between mental health and academic performance among university students in Kazakhstan. The research problem is grounded in evidence showing that anxiety and depressive symptoms are common among university students and may impede academic functioning. A systematic review and meta-analysis found that about one-third of undergraduate students report higher anxiety symptoms, while another global meta-analysis showed that depression and anxiety are widespread in college populations (Ahmed et al., 2023, Li et al., 2022). Moreover, longitudinal evidence consistently suggests that higher levels of anxiety and depressive symptoms are associated with lower GPAs among university students (Awadalla et al., 2020).

Within the scope of this research, the study will examine whether trait anxiety and depressive features are associated with semester GPA and whether they predict semester GPA after controlling

for age, gender, and academic workload. A longitudinal quantitative design with prospective follow-up will be used at a private university in Kazakhstan. Approximately 150 undergraduate and master's students will complete the STAI-T, the MTSD, and demographic questions. Semester GPA will be collected three months later, if possible, from official university records after obtaining student consent. A follow-up group of 50 students will be included to make the longitudinal part of the study stronger.

Semester GPA was chosen as the indicator of academic success because it is one of the most common and practical measures of academic performance in higher education research. Unlike a single test or assignment, GPA reflects performance across several courses and therefore gives a broader picture of a student's academic achievement over time. Previous research has also shown that university performance is related to different psychological factors, which supports the use of GPA as an appropriate outcome variable in this study (Richardson et al., 2012).

The other variables in this study were selected because it is important to distinguish between more stable emotional tendencies and temporary emotional states. Trait anxiety refers to a person's general tendency to feel anxious across different situations, whereas state anxiety reflects anxiety that appears in a specific moment, such as before an exam or presentation. As far as study focuses on academic functioning across the whole semester rather than during one stressful event, trait anxiety seems to be more appropriate predictor. This choice is also supported by Attentional Control Theory, which suggests that anxiety can reduce attentional control and make thinking less efficient under pressure (Eysenck et al., 2007).

A similar distinction can also be applied to depression. The MTSD was designed to measure both state and trait aspects of depression, which means it can capture both current depressive symptoms and more long-term depressive tendencies (Chiappelli et al., 2014). This is important because depressive experiences may include both a stable vulnerability and a more immediate emotional condition, and both may affect students' academic lives in different ways.

It is also important to note that, in both anxiety and depression, trait and state components may occur together. For example, a student with a stable tendency toward anxiety may also experience strong situational anxiety during exams, deadlines, or presentations. In a similar way, a student with more enduring depressive tendencies may also go through a period of stronger depressive symptoms during stressful academic situations. When trait and state components appear together, the overall emotional burden may become stronger, which may further increase difficulties with concentration, emotional regulation, motivation, and academic persistence. Because of this, their combined effect may have a stronger influence on academic outcomes than either one alone.

In addition, anxiety and depressive symptoms often appear together. This comorbidity may be especially harmful for academic functioning because it can affect both cognitive and motivational processes at the same time. For example, anxiety may interfere with concentration, working memory, and attentional control, while depressive symptoms may lower motivation, reduce energy, and make it harder for students to persist with academic tasks. When these

difficulties occur together, students may find it more difficult to stay engaged with their studies and perform consistently across the semester (Awadalla et al., 2020; Gotlib & Joormann, 2010; Li et al., 2022).

Research Problem

Although international research on student mental health is growing, there remains a need for more research in Kazakhstan on how trait anxiety and depressive features relate to actual academic outcomes. Many studies use cross-sectional designs, and some rely only on self-reported academic outcomes. As a result, there is limited evidence on whether trait anxiety and depressive features predict semester GPA and actual dropout in a Kazakhstani private university context (Awadalla et al., 2020; Yertukeshova et al., 2024).

Research Questions

1. Is trait anxiety associated with semester GPA among students at a private university in Kazakhstan?
2. Are depressive features (state and trait components) associated with semester GPA among these students?
3. To what extent do trait anxiety and depressive features predict semester GPA after controlling for age, gender, and academic workload?
4. Do trait anxiety and depressive features predict actual dropout (enrollment status at the end of the semester) after controlling for the same covariates?

Hypotheses

$H0_1$: There is no significant association between trait anxiety and semester GPA.
$H1_1$: Higher trait anxiety will be associated with lower semester GPA.

$H0_2$: There is no significant association between depressive features and semester GPA.
$H1_2$: Higher depressive features (state and/or trait components) will be associated with lower semester GPA.

$H0_3$: Trait anxiety and depressive features do not significantly predict semester GPA after controlling for age, gender, and academic workload.
$H1_3$: Trait anxiety and depressive features will significantly predict semester GPA after controlling for these variables.

$H0_4$: Trait anxiety and depressive features do not significantly predict actual dropout at the end of the semester.
$H1_4$: Higher trait anxiety and depressive features will be associated with higher likelihood of actual dropout at the end of the semester.

Theoretical Framework

This study is guided by Attentional Control Theory, cognitive theory of depression, and self-regulation theory. Together, these perspectives help explain how emotional difficulties may influence academic performance not only through feelings, but also through attention, thinking, motivation, and behavior. Using these theories together makes the framework more suitable for understanding students' academic functioning across a semester.

Attentional Control Theory explains why anxiety may affect academic performance. The theory suggests that anxiety reduces the efficiency of attentional control and makes it harder to stay focused on goal-directed tasks. In academic settings, this may create problems with concentration, working memory, and performance under pressure (Eysenck et al., 2007). This is especially relevant for university students, because academic success often depends on the ability to stay focused for long periods of time despite stress. If students spend more mental energy dealing with anxious thoughts, they may have fewer cognitive resources available for learning, problem solving, and completing academic tasks effectively.

Cognitive theory of depression helps to explain why depressive features may be related to lower academic performance. Cognitive models propose that depressive functioning is linked to negative thinking, reduced motivation, and cognitive control difficulties, which may influence persistence and task completion (Beck et al., 1979; Gotlib & Joormann, 2010). In academic life, this may appear as low confidence, avoidance of difficult tasks, or difficulty maintaining effort over time. As a result, students with stronger depressive features may find it harder to remain engaged with coursework, even when they have the ability to perform well.

Self-regulation theory provides a broader academic framework. Academic success depends on planning, attention management, monitoring progress, and sustained motivation. Psychological difficulties may disrupt these processes, which supports the expectation that anxiety and depressive features can influence academic outcomes (Richardson et al., 2012). This theory is useful because it connects emotional difficulties with everyday academic behaviors such as studying regularly, meeting deadlines, and adjusting strategies when problems appear. In this way, self-regulation theory helps explain how emotional vulnerabilities may gradually affect semester GPA over time rather than only in one isolated situation.

Research Design

This study will use a longitudinal quantitative design with prospective follow-up. Trait anxiety and depressive features will be measured at the beginning of the semester, and academic outcomes (semester GPA and enrollment status) will be collected at the end of the semester. This design strengthens inference compared to cross-sectional designs because predictors are measured before academic outcomes (Awadalla et al., 2020). Additionaly, approximately 50 students will fill the questionaries as a follow-up sample to support the research.

Setting and Participants

The study will be conducted at a private university in Kazakhstan. Participants will include undergraduate and master's students from different majors, aged 18 years or older. The target sample at the beginning of the semester will be approximately 150 students. A follow-up subsample of approximately 50 students will be tracked at the end of the semester to strengthen the longitudinal evidence (depending on consent and availability of academic records).

Sampling and Recruitment

Convenience sampling will be used. Participants will be recruited through class announcements, posters, and university communication channels. This approach is practical for a university-based study but may limit generalizability.

Measures

Trait anxiety: The State–Trait Anxiety Inventory, Trait subscale (STAI-T) will be used to assess trait anxiety (Spielberger et al., 1983).

Depressive features (state + trait-like): The Maryland Trait and State Depression (MTSD) scale will be used to assess state and trait components of depressive experience (Chiappelli et al., 2014).

Academic outcomes:

- Semester GPA at the end of the semester (continuous outcome).
- Actual dropout defined using official enrollment status at the end of the semester (binary outcome; enrolled vs not enrolled/withdrawn).

Control variables: Age, gender, and academic workload.

Procedure

At the beginning of the semester, students who agree to participate will complete a paper-based survey at the university. The first page will include informed consent. Participants will complete demographic questions, questions about academic workload, the STAI-T, and the MTSD. Participants will also provide information needed for matching academic records (e.g., student ID), if official data collection is approved.

At the end of the semester, semester GPA and enrollment status will be collected. When possible, these outcomes will be obtained from official university records with participant consent and relevant institutional approval. Because identifying information will be collected for record matching, the study will be confidential rather than anonymous.

Data Analysis Procedure and Interpretation

Data will be analyzed using SPSS.

1. Descriptive statistics will be computed for all variables (means, standard deviations, ranges, frequencies).
2. Reliability will be assessed for STAI-T and MTSD using Cronbach's alpha.
3. Correlation analyses will examine relationships among trait anxiety, depressive features (state and trait), and semester GPA.
4. Multiple linear regression will test whether trait anxiety and depressive features predict semester GPA after controlling for age, gender, year of study, and academic workload.
5. Logistic regression will test whether trait anxiety and depressive features predict actual dropout (enrollment status), controlling for the same covariates.

Interpretation will focus on effect direction, strength, and statistical significance. Findings will be discussed as associations with stronger temporal ordering because predictors are measured at the beginning of the semester and outcomes are collected later.

Potential Limitations

This study has several limitations. First, it will be conducted at a single university, which may limit generalizability. Second, the design is longitudinal but still non-experimental, so it cannot prove causation. Third, participant attrition may reduce the sample size at follow-up. Fourth, mental health variables are measured using self-report questionnaires rather than clinical interviews. These limitations are common in student mental health research and should be considered when interpreting results (Awadalla et al., 2020; Li et al., 2022).

Conclusion

This proposal suggests that trait anxiety and depressive features may be important psychological factors related to academic success and persistence among university students. International evidence indicates anxiety and depressive symptoms are common and may be linked to lower academic functioning and GPA (Ahmed et al., 2023; Awadalla et al., 2020; Li et al., 2022). Local evidence from Kazakhstan also supports the relevance of student mental health in higher education settings (Hernández-Torrano & Ibrayeva, 2024; Yertukeshova et al., 2024). By using a longitudinal quantitative design with prospective follow-up, this study aims to provide clearer evidence about the relationship between trait anxiety, depressive features, semester GPA, and actual dropout at a private university in Kazakhstan. Findings may help strengthen student support services, guide early intervention, and support prevention strategies for student well-being and academic success.

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Strategic Compartmentalization: How Kazakhstan Uses BRI Economic Integration to Reinforce Foreign Policy Autonomy (2013-2023)

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ABSTRACT

This article analyzes Kazakhstan's pursuit of its multi-vector foreign policy by deepening economic engagement with China through the Belt and Road Initiative from 2013 to 2023. The key argument is that Kazakhstan preserves its strategic autonomy not by opposing integration with China, but by purposefully separating economic cooperation from political and security alignment, a process referred to here as strategic compartmentalization. By maintaining this separation, Kazakhstan leverages economic ties for growth while safeguarding its independent foreign policy choices. The analysis relies on qualitative evaluation of publicly available official documents, presidential addresses, foreign policy concepts, and secondary economic and transport indicators from official datasets.

The data indicate that Kazakhstan consistently frames its cooperation with China in economic and developmental terms. Even as Kazakhstan seeks new partnerships and diversification, it avoids fully aligning with a single power. These results offer a nuanced perspective on expectations regarding asymmetric interdependence, suggesting that deeper economic engagement can, under specific conditions, strengthen rather than diminish autonomy.

This article advances the concept of strategic compartmentalization as an analytical framework, enhancing our understanding of Kazakhstan's multi-vectorism. It demonstrates how a strategically positioned middle power may leverage integration to build resilience within a competitive regional order.

Keywords: multi-vectorism, BRI, middle powers, strategic autonomy, economic diplomacy, multiplex peace, Middle Corridor, compartmentalization.

INTRODUCTION

The contemporary international system is increasingly characterized by pervasive interdependence, overlapping interests, and a diminished role for any single great power in shaping the global order. Recent scholarship describes this as a multiplex environment in which states navigate broad partnerships and selectively engage across issue areas. For countries in strategically contested regions, however, deeper economic integration with major powers often brings new forms of dependence that can restrict foreign policy autonomy (Neafie et al., 2025; Thorhallsson,

2018). This study addresses how states manage the tension between engagement and autonomy in such circumstances.

Kazakhstan exemplifies this strategic challenge. As the world's largest landlocked state and a central Eurasian nation, Kazakhstan has long pursued a multi-vector foreign policy to maintain sovereignty, balance major powers, and maximize diplomatic flexibility. This approach has prioritized external connectivity, transit diversification, and access to foreign markets (Kassen, 2018; Nyshanbayev et al., 2024). Since 2013, Kazakhstan's engagement with China's Silk Road Economic Belt and later the Belt and Road Initiative (BRI) has intensified economic modernization and regional relevance, while raising questions about the impact of deepening ties with China on Kazakhstan's foreign policy autonomy.

Conventional wisdom suggests that greater economic dependence on a stronger power constrains policy autonomy for smaller states. Policy debates on the BRI often focus on dependency and the erosion of autonomy. Yet Kazakhstan's experience challenges this narrative. This article argues that Kazakhstan maintains its multi-vector foreign policy not by resisting economic integration with China, but by compartmentalizing economic cooperation from political and security alignment. Building on, but expanding, Contessi's issue-splitting concept, the paper posits that Kazakhstan organizes distinct spheres in its relationship with China, ensuring that economic ties do not dictate its broader external orientation (Contessi, 2015).

This research investigates how Kazakhstan balances growing economic ties with China under the BRI while sustaining multi-vector foreign policy autonomy from 2013 to 2023. The central claim is that Kazakhstan employs three forms of strategic compartmentalization: discursively framing BRI cooperation as economic and developmental; structurally diversifying routes and partnerships; and strategically embedding China relations within broader networks. Qualitative analysis of official documents and economic data demonstrates how this compartmentalization operates in practice.

The article offers three key contributions. First, it treats strategic compartmentalization as a clear explanation for small and mid-sized states facing unbalanced economic ties. Second, it gives a subtle reading of Kazakhstan's foreign policy, rejecting simple balancing, bandwagoning, or passive accommodation. Third, it enriches the debate on asymmetric interdependence by arguing that closer economic ties do not always entail a loss of autonomy. Sometimes, these ties can actually strengthen independence.

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

Kazakhstan's foreign policy is typically understood through the framework of multi-vectorism. Kassen (2018) describes this as a pragmatic strategy shaped by Kazakhstan's landlocked and transcontinental setting, one that seeks to turn geographic constraints into diplomatic flexibility and external access. Omelicheva and Du (2018) add that Kazakhstan's multi-vectorism is active, enabling tactical concessions and leverage against stronger rivals. Vanderhill, Joireman, and

Tulepbayeva (2020) similarly present Kazakhstan's behavior as that of a secondary power, stressing omni-enmeshment and complex balancing, beyond mere balancing or bandwagoning. Recently, scholars have linked its multi-vector policy to a more crowded, interdependent world, suggesting diversified engagements can continue even under rising geopolitical rivalry (Neafie et al., 2025). This literature helps explain why Kazakhstan seeks to preserve diplomatic flexibility, but it has not fully explored how that flexibility is maintained under conditions of deepening economic asymmetry with a major partner.

This gap becomes especially clear when Kazakhstan is situated within the broader literature on small states and asymmetric relationships. Scholarship on small states suggests that weaker states operate under structural constraints, possess limited room for maneuver, and are often highly vulnerable to pressure from major powers (Thorhallsson, 2018; Vaicekauskaitė, 2017). Both realist and small-state theories predict that as dependence grows, policy autonomy shrinks. At the same time, some scholars note that asymmetry may also give the weaker party stronger incentives to consolidate its position. Related studies on asymmetry and coercion show that when a weaker state lacks alternatives, asymmetric trade can become political leverage (Kim, 2019).

From this view, greater economic integration with a stronger power should increase the smaller state's exposure to pressure, spillover, and constraints. This framework is particularly useful for Kazakhstan, which has historically pursued a foreign policy designed to avoid excessive dependence on any single external actor while preserving multiple external partnerships. The literature on hedging and selective engagement, however, makes it more difficult to pin down that assumption. Hedging scholarship, especially Kuik's work, has theorized hedging as a form of insurance-seeking behavior under uncertain conditions: states avoid rigid alignment, expand partnerships, and build fallback options across the economic, diplomatic, and security domains (Kuik, 2021).

Contessi's concept of issue splitting is especially useful here because it shows how states differentiate across foreign and security issue areas rather than treating alignment as a single, all-or-nothing choice (Contessi, 2015). Through this logic, the Kazakhstani case serves as an example for why closer economic cooperation with China on infrastructure, trade, and transit can intensify, without implying that the same progress in political/ideological alignment can be replicated. Nevertheless, many accounts about hedging, omni-enmeshment, and multi-vector bargaining remain largely related to diplomatic playing fields and alignment behavior (Vanderhill et al., 2020). They are more effective at describing Kazakhstan's external posture than at explaining how deep economic integration is managed so that it does not become a broader source of political vulnerability. It is precisely here that the main gap in the literature emerges. While existing research explains Kazakhstan's external strategy in terms of prudence, balance, hedging, or multi-vector bargaining, it does not fully explain how substantial and lasting economic integration with China as part of the Belt and Road Initiative can coexist with maintaining foreign policy autonomy.

This article addresses this gap through the concept of strategic compartmentalization. Strategic compartmentalization, while drawing on and extending the logic of issue splitting, reflects

the strategic separation of economic cooperation from political, norm-based, and security alignment. The argument here is that Kazakhstan does not preserve autonomy by rejecting integration with China altogether. Instead, it maintains autonomy by structuring that integration selectively: welcoming Chinese capital, transit, and connectivity where they serve national development goals, while ensuring that such ties do not become the organizing principle of Kazakhstan's broader external orientation. In this sense, strategic compartmentalization offers a clearer analytical lens for explaining how Kazakhstan can deepen BRI-related cooperation without undermining its multi-vector foreign policy.

METHODOLOGY

This study adopts a qualitative single-case design to examine how Kazakhstan pursued a multi-vector foreign policy while deepening its economic relations with China under the Belt and Road Initiative between 2013 and 2023. Kazakhstan was selected as a theoretically significant case because it occupies a central position in Eurasian connectivity while also pursuing a long-standing strategy of diversified external engagement. The period under examination begins in 2013, when the Silk Road Economic Belt was launched in Astana, and extends over the following decade, during which BRI-related cooperation became increasingly embedded in Kazakhstan's trade, infrastructure, and foreign policy discourse (Xi, 2013; Kassen, 2018).

The study relies solely on publicly available official documents and secondary statistical databases. It does not rely on interviews, surveys, focus groups, participant observation, or other human-subject primary data. The documentary corpus includes official materials that articulate Kazakhstan's foreign policy priorities and external partnerships, presidential speeches, state-of-the-nation addresses, foreign policy concepts, bilateral statements, and official government documents on economic diplomacy, connectivity, and regional cooperation. This source base is appropriate because Kazakhstan's official documents consistently codify the key principles of its foreign policy, including multivectorism, balance, pragmatism, mutual benefit, sovereignty, and development.

In this respect, Kazakhstan's 2020-2030 Foreign Policy Concept is particularly relevant, as it places strong emphasis on economic diplomacy and broad geostrategic partnership-building (Web-1; Web-2). The purpose of this analysis was to examine how Kazakhstan discursively and strategically managed its relations with China without sacrificing broader foreign policy autonomy. Rather than treating Kazakhstan's China policy as a uniform alignment choice, the study examined whether official discourse distinguished economic cooperation from political and security alignment. To do so, the evidence was structured into three broad dimensions of strategic compartmentalization: discursive, structural, and strategic. The discursive dimension captured the language through which cooperation with China and the BRI was framed as economic, technical, developmental, or transit-related rather than ideological or geopolitical. The structural dimension included reference to route diversification, alternative corridors, logistics infrastructure, and actions to alleviate over-reliance on any one route.

The strategic dimension explored whether China-related cooperation was situated within a broader framework of partnerships alongside Russia, the European Union, and the United States. This enabled the study to shift from general statements of multivectorism to concrete ways in which autonomy was overtly preserved (Contessi, 2015; Sciorati, 2021; Web-1). To strengthen the explanatory basis of the study, document analysis was complemented by secondary economic and transport indicators that made it possible to trace the scale and trajectory of Kazakhstan's engagement with China over time. Trade statistics compiled by UN Comtrade and official Kazakh statistics were used to provide context for the expansion of bilateral economic ties, and World Bank materials were used to frame this in a larger narrative of trade openness, infrastructure, and corridor development.

These empirical sources were not used as standalone evidence of political influence. Instead, they played a complementary role by demonstrating the empirical significance of Kazakhstan's economic integration with China and by testing whether deeper integration was accompanied by a narrowing of external options. Given this, the quantitative element reinforces the study's key puzzle: despite growing economic links, Kazakhstan's official political rhetoric and partnership dynamics did not indicate an exclusive alignment but continued to reflect a multi-vector focus (World Bank, 2023).

The study therefore treats strategic compartmentalization as an observable process rather than a vague descriptive outcome. It does so by linking abstract theoretical claims about asymmetric interdependence to concrete indicators visible in state discourse and policy framing. If deeper reliance were accompanied by political subservience, official documents are likely to show greater exclusivity toward China, fewer references to alternative partners, and a closer fit between economic and geopolitical discourse. Instead, the analysis observes whether Kazakhstan maintained the distinction of these domains over time. This approach makes it possible to assess not only whether Kazakhstan remained multi-vector in general terms, but also how that autonomy was reproduced through repeated discursive choices, institutional positioning, and infrastructure diversification (Kim, 2019; Contessi, 2015).

This research design has several limitations. As a single-case study, it does not claim broad statistical generalizability. In addition, official policy documents reflect state discourse and may not capture every informal bargaining process underlying foreign policy making. For the purposes of this study, however, official documents are not merely a limitation but a central source of evidence, because the key argument concerns the calculated division of spheres in Kazakhstan's external positioning, the public manner in which the state presents and coordinates its international relations is analytically significant. Combined with secondary economic indicators, this design is sufficient to identify the mechanisms through which Kazakhstan deepened BRI-related economic relations while maintaining foreign policy autonomy.

GEOECONOMIC CONTEXT OF KAZAKHSTAN'S EXTERNAL STRATEGY

Kazakhstan's external strategy is shaped by a fundamental geographic condition: it is both the world's largest landlocked state and a transcontinental country positioned between Europe and Asia. As Kassen argues, this location creates a dual reality. On the one hand, the absence of direct access to global maritime routes increases dependence on neighboring transit states and makes external market access more vulnerable to disruption. On the other hand, the same geography gives Kazakhstan an opportunity to position itself as an intermediary corridor and logistics hub across Eurasia. In this sense, Kazakhstan's multi-vector foreign policy is not merely a diplomatic choice but also a geoeconomic response to the constraints and opportunities created by its landlocked transcontinental position. This geoeconomic logic helps explain why Kazakhstan's engagement with China under the Belt and Road Initiative was proactive rather than merely reactive. Astana did not treat the BRI as an externally imposed framework, but rather as a platform that could be aligned with its domestic development priorities. In particular, Nurly Zhol was introduced as a national development strategy focused on infrastructure modernization, transit capacity, employment creation, and long-term resilience, rather than as a derivative extension of Chinese policy (Web-2).

As Kassenova (2017) notes, the complementarity between the Silk Road Economic Belt and Nurly Zhol was politically significant because it enabled Kazakhstan to embed Chinese connectivity within a domestically framed modernization agenda. This logic of domestication and selective linkage is later echoed in the 2020-2030 Foreign Policy Concept, which treats external partnerships instrumentally and links them to national development, diversification, and sovereign policy autonomy (Web-1).

In 2023, China was Kazakhstan's largest bilateral partner (trade turnover: USD 31.5 billion and 22.5% of trade), while Russia accounted for USD 26.0 billion and 18.6%, as reflected in Table 1.

Table 1. Kazakhstan's External Trade Structure with Key Partners (2023)

Partner	Trade Turnover (billion $)	Change by 2022	Share of turnover (%)
China	31.5	+30%	22.5%
Russia	26.0	-3.7%	18.6%
EU (all states)	42.6	+5%	30.5%

Source: compiled by the author based on Web-4 and Web-5

At the same time, the total for the European Union was larger than either single partner, reaching USD 42.6 billion and accounting for 30.5% of total trade. This distribution is analytically

significant because it suggests that deepening economic relations with China did not displace Kazakhstan's broader pattern of diversification. Rather, Chinese growth took place within a broader external portfolio that continued to include Russia and, even more significantly, the European Union (Web-4; Web-5).

This pattern is reinforced by broader transit dynamics. Available data on the Middle Corridor indicate that, after 2022, trade flows through corridor states increased sharply, that around one-third of corridor trade consisted of transit, and that this transit was closely linked to Central Asia-Europe and China-Europe trade flows. These patterns support the argument that Kazakhstan's geoeconomic strategy is not reducible to a simple eastward shift. Instead, it uses connectivity with China to enhance Kazakhstan's role in Eurasian circulation, while preserving multiple external economic linkages (World Bank, 2023).

Strategic Compartmentalization as a State Mechanism

From Issue Splitting to Strategic Compartmentalization

Issue splitting provides a useful starting point for understanding Kazakhstan's China policy, but it does not fully explain the logic of the case examined in this article. Contessi defines issue splitting as the diversification of foreign and security policy across issue areas rather than the pursuit of an all-or-nothing choice. In Kazakhstan's case, this helps explain why cooperation with China intensified in infrastructure, trade, and transit without producing the same degree of political or ideological alignment. However, the argument advanced here goes further. Kazakhstan not only diversified its foreign ties across issue areas, but also sought to contain the political consequences of asymmetrical economic integration by organizing different spheres of external engagement according to distinct strategic logics. For this reason, strategic compartmentalization offers a more precise description of the mechanism at work (Contessi, 2015).

This distinction matters because Kazakhstan's foreign policy is articulated not in the language of exclusive partnerships, but in the language of balance, pragmatism, and diversified cooperation. In official doctrinal terms, China is depicted as a major economic partner rather than the organizing center of Kazakhstan's overall foreign policy. This is consistent with broader research on multi-vectorism, which emphasizes Kazakhstan's use of tactical inclusion, complex balancing, and broad external engagement to reduce reliance on any single dominant actor (Web-1; Omelicheva and Du, 2018; Vanderhill et al., 2020).

Official Codification and Discursive Containment

The mechanism becomes even clearer in the evolution of official foreign policy thinking under Tokayev. The 2020-2030 Foreign Policy Concept, discussed later in the article, preserves the core principles of multi-vectorism while placing greater emphasis on economic diplomacy, pragmatic benefit, and the defense of sovereignty in a more fragmented international environment.

This is significant because it suggests that the separation of economic cooperation from broader political alignment was not merely a matter of convenience. Rather, it became increasingly institutionalized within official doctrine (Web-1; Nyshanbayev et al., 2024).

A further component of this mechanism is discursive containment. Official materials consistently link Kazakhstan's relationship with China to trade, transport, logistics, investment, and development, rather than to ideological affinity or exclusive geopolitical identification. This is consistent both with broader discourses framing the BRI as an open and inclusive form of international economic cooperation and with Kazakhstan's own preference for depoliticized, development-oriented language in its engagement with Chinese initiatives. At the same time, discourse on sovereignty, security, and broader regional balance remains distributed across a wider constellation of relationships rather than being folded into a China-centered narrative (Liu et al., 2018; Sciorati, 2021; Xi, 2013).

Taken together, these patterns show why strategic compartmentalization should be understood as a state mechanism rather than a descriptive label. It is visible in the selective institutionalization of partnerships, the differentiated language of official doctrine, and the separation between corridor-building and political alignment. In this sense, Kazakhstan's China policy is neither simple accommodation nor simple balancing, but a managed division of external engagement into spheres that maximize gains while limiting spillover (Contessi, 2015; Web-1; Sciorati, 2021).

Voting Patterns in the UN General Assembly as Evidence of Strategic Autonomy

One of the clearest ways to assess whether economic integration translated into political alignment is to examine Kazakhstan's behavior in multilateral voting. United Nations General Assembly voting is particularly useful for this purpose because it captures how states position themselves on politically sensitive issues under conditions of competing external pressures. If deeper economic engagement with China had generated straightforward political dependence, one would expect Kazakhstan's voting behavior to display a more consistent pattern of convergence with Beijing across major international disputes. The available evidence, however, points to a more selective and differentiated pattern. Yuneman's analysis of UNGA voting between 2007 and 2022 shows that Kazakhstan's main extra-regional voting vector was China rather than Russia, yet this did not amount to stable one-vector alignment (Yuneman, 2023).

As Table 2 shows, Kazakhstan's voting alignment with China remained consistently high, rising from 81 percent in 2014 to 89 percent in 2022.

Table 2. Consistency of Kazakhstan's votes in the UN General Assembly (in %)

Year	China	Russia	Germany (EU)	USA

2014	81%	64%	59%	21%
2018	84%	72%	61%	15%
2022	89%	62%	68%	25%

Source: adapted from Yuneman (2023)

This exceeded its voting cohesion with Russia across all three years, despite Russia's formal status as Kazakhstan's closest security ally. To be sure, however, this trend should not be considered proof of an automatic political allegiance to Beijing. Instead, it complicates any simple assumption that Kazakhstan's foreign policy should reflect either formal alliance commitments with Russia or the expansion of economic relations with China. What the voting record reveals instead is a hierarchy of relationships that is real but not absolute, and therefore inconsistent with political subordination to any single external actor (Yuneman, 2023).

The strongest evidence of preserved autonomy lies not in aggregate cohesion scores alone, but in Kazakhstan's handling of contentious resolutions on which major powers took directly opposing positions. Yuneman shows that Kazakhstan abstained on Resolution 68/262 on the territorial integrity of Ukraine, avoided Syria-related resolutions after 2013, and continued this pattern after Russia's full-scale invasion of Ukraine by withholding blanket support for Moscow on key UNGA resolutions. This suggests that abstention was not a sign of passivity but rather a strategic instrument of hedging. It allowed Astana to avoid directly confronting its key partners while also resisting pressure to align fully with their most politically costly positions (Yuneman, 2023).

This interpretation is further reinforced by issue-specific variation in Kazakhstan's voting behavior. Yuneman notes that Kazakhstan most commonly aligned with China on issues of armed conflict resolution, disarmament, and development, while its overlap with Russia was more evident in human rights and decolonization. This matters because it shows that Kazakhstan's multilateral behavior was not organized around a single geopolitical center. Instead, it varied across issue areas, which is exactly what one would expect from a state seeking to preserve room for maneuver through selective alignment. In that sense, UNGA voting provides strong evidence for the strategic dimension of compartmentalization: economic relations with China deepened, while political behavior remained differentiated, issue-specific, and carefully constrained (Yuneman, 2023).

This broader pattern is consistent with Kazakhstan's behavior after 2022. Arynov and Yesdauletova et al. show that Tokayev refused to recognize the self-proclaimed Donetsk and Luhansk entities and adopted a cautious stance on the war in Ukraine, seeking to avoid both overt defiance of Russia and full alignment with Moscow. Other analyses describe this approach as cautious neutrality rather than a full geopolitical shift, noting Kazakhstan's simultaneous efforts to preserve relations with Russia, deepen engagement with the European Union, and manage the risks

of sanctions spillover. Taken together, these patterns suggest that Kazakhstan's political behavior under pressure remained selective and strategically calibrated, even as its economic ties with China and Russia continued to deepen (Arynov, 2022; Yesdauletova et al., 2024; Neafie et al., 2025).

The significance of this evidence extends beyond voting behavior itself. The UNGA evidence suggests that Kazakhstan's multilateral behavior is guided more by a persistent preference for flexibility, differentiation, and controlled distance than by bloc discipline. Under Tokayev, this was not merely a situational response to crisis. It also became increasingly visible in the institutional language of foreign policy, most clearly in the 2020-2030 Foreign Policy Concept, which retained the logic of multivectorism while placing greater emphasis on economic diplomacy, regional leadership, and broad geostrategic partnerships. The next section examines how this strategic autonomy was codified and economically re-articulated at the doctrinal level (Yuneman, 2023; Web-1; Nyshanbayev et al., 2024).

Institutional Evolution under Tokayev: The 2020-2030 Foreign Policy Concept

Kazakhstan's external orientation did not fundamentally rupture during the transition from Nursultan Nazarbayev to Kassym-Jomart Tokayev. On the contrary, the 2020-2030 Foreign Policy Concept explicitly anchors itself in continuity, identifying the preservation of Nazarbayev's foreign-policy line as a basic principle while adapting Kazakhstan's diplomatic instruments to what the document describes as long-term realities. The rationale for adopting the new concept was precisely the need to adjust foreign-policy views and instruments to a changing international environment marked by intensifying geopolitical and geo-economic competition, sanctions standoffs, technological change, and the growing vulnerability of medium and small states. At the doctrinal level, therefore, Tokayev's foreign policy did not abandon multivectorism, but rearticulated it in a more self-consciously strategic and economically instrumental form. The Concept defines Kazakhstan's policy as multi-vector, proactive, and pragmatic, linking it directly to the defense of national interests, the country's openness to the external world, and the inseparable connection between security and development (Web-1).

This combination of continuity and change is also how Tokayev's period is interpreted in the scholarly literature. As Nyshanbayev et al. argue, Kazakhstan's foreign policy under Tokayev entered an unprecedented phase in which geo-economic considerations gained increasing significance without dismantling the underlying multi-vector structure. The two pillars of national security and economic development are also retained in the new Concept. Kazakhstan's self-presentation also shifted, moving away from the image of an integration-oriented state toward a more explicit claim to regional leadership. In their interpretation, this is not merely a symbolic adjustment. Rather, it reflects an evolving policy aimed at expanding broad geostrategic partnerships with China, Russia, the United States, the European Union, and Central Asian neighbors simultaneously, while making diplomacy more directly subordinate to modernization, competitiveness, and material interests (Nyshanbayev et al., 2024).

The official text of the Concept supports this interpretation. Its objectives include strengthening sovereignty and foreign-policy independence, consolidating Kazakhstan's position as a leader in Central Asia, establishing the country as an active and responsible member of the international community, maintaining predictable and mutually beneficial relations with foreign states, increasing the competitiveness of the national economy, and placing the practical interests of citizens and national business at the center of foreign policy. This is an important change in focus. The Concept no longer treats external relations merely as an instrument of balancing among great powers - rather, it presents foreign policy more explicitly as a means of generating observable domestic benefits. In this way, the document institutionalizes a form of strategic compartmentalization: external partnerships are valued not as ends in themselves, but insofar as they advance sovereignty, growth, diversification, and room for maneuver (Web-1).

This is most visible in the Concept's expanded economic-diplomacy agenda. Instead of listing the fourteen priorities in isolation (i.e., as a separate inventory), we can organize them into three complementary clusters. The first cluster concerns sovereignty and regional status: maintaining independence, strengthening Kazakhstan's status as a leading power in Central Asia, and advancing its long-term national interests through foreign policy. The second cluster concerns external economic upgrading: promoting national firms abroad, directing foreign capital into non-resource sectors, and integrating the most competitive segments of Kazakhstan's economy into regional and global trade networks. The third cluster concerns integration and connectivity: turning Kazakhstan into a transcontinental transit and logistics hub on East-West and North-South routes through the potential of Nurly Zhol and foreign infrastructure initiatives, strengthening energy security through diversified export routes, promoting the Astana International Financial Centre, supporting the WTO-based trading system, contributing to regional food security and participating in official development assistance. Taken together, these priorities show that Tokayev's Concept does not simply economicize diplomacy - it embeds economic diplomacy within a broader doctrine of state resilience through diversification (Web-1; Nyshanbayev et al., 2024; Web-2).

This matters directly for the article's central argument. If deepening ties with China under the Belt and Road Initiative had pushed Kazakhstan toward one-vector dependence, one would expect the 2020-2030 Concept to elevate China into a privileged organizing principle. Instead, the document establishes a framework in which China appears as one important partner within a broader geostrategic architecture that also includes Russia, the EU, the US, Central Asia, and international organizations. The Concept's language is non-exclusive in practice: it focuses on friendly, equal, and mutually supportive relations with all states and organizations of practical interest to Kazakhstan, and it does not systematically tie national development to any external vector. This reinforces the broader pattern already visible in Kazakhstan's voting record and geo-economic diversification. Under Tokayev, autonomy was defended not by reducing external engagement, but by widening, and in some cases, institutionalizing it (Web-1; Nyshanbayev et al., 2024).

The implementation design of the Concept further supports this interpretation. While the document gives the Ministry of Foreign Affairs a key role, it explicitly states that foreign policy is to be implemented through intergovernmental commissions, state bodies, and the coordination of diplomacy and foreign economic policy, all of which are updated every two years. Its anticipated outcomes are framed in practical terms: greater independence, a more favorable external environment, deeper integration into the world economy through diversification and digitization, and stronger protection of citizens and businesses abroad, ultimately generating concrete benefits for the state, national business, and the people of Kazakhstan. This is analytically significant because it suggests that Tokayev-era multivectorism was formalized not only as a balancing doctrine, but also as a governance framework for transforming external relations into a controlled domestic advantage. In this sense, the 2020-2030 Concept represents the clearest doctrinal expression of strategic compartmentalization in the period under study: it preserves the plural external structure of Kazakhstan's foreign policy, while making economic diplomacy the principal instrument through which that autonomy is reproduced (Web-1).

The Middle Corridor as an Instrument of Structural Diversification

Kazakhstan's shift toward the Trans-Caspian International Transport Route (TITR), or the Middle Corridor, is better understood as part of a broader strategy of route diversification than as a short-term response to the events of 2022. Kassen emphasizes that Kazakhstan's landlocked and transcontinental position makes external connectivity a foreign-policy imperative, while Kassenova shows that Astana has long sought alternatives to excessive reliance on Russian-controlled access to European markets. In this context, Kazakhstan's engagement with TRACECA and its interest in trans-Caspian energy and transport options reflected a long-term effort to expand the country's external access beyond the northern vector (Kassen, 2018; Kassenova, 2017).

The strategic importance of the Middle Corridor increased sharply after Russia's invasion of Ukraine. According to the World Bank, the corridor gained new momentum in 2022 as shippers sought to reduce dependence on routes crossing Russian territory. The report is careful not to overstate the corridor's maturity - before the war, the northern route through Russia and Belarus accounted for the overwhelming majority of China-Europe land traffic, while the Middle Corridor represented only a much smaller share. Its relevance, therefore, lies not in replacing the northern route, but in creating a credible alternative that reduces Kazakhstan's exposure to single-route vulnerability. This is precisely what makes the corridor analytically important for the argument of this article (World Bank, 2023).

Recent scholarship strengthens this interpretation by showing how corridor-centered interdependence reshapes Kazakhstan's external behavior in increasingly selective ways. Shakirova, Parpiyev, and Sultanmuratov argue that the development of the Middle Corridor increases Kazakhstan's engagement with transit nodes through pragmatic, performance-oriented diplomacy, while also encouraging cautious and legally framed positioning in politically sensitive regional settings. Their central contribution is especially relevant here - they interpret these patterns

through multi-vector hedging and complex balancing, producing what they describe as a domain-specific vector hierarchy. In other words, corridor functionality can become a priority without implying political alignment. This formulation aligns closely with the logic of strategic compartmentalization, showing how Kazakhstan can prioritize a transport route and its associated economic relationships without allowing those ties to dictate its broader foreign-policy orientation (Shakirova et al., 2026).

The Middle Corridor also matters, because it embeds Kazakhstan within a broader stakeholder landscape. According to World Bank materials, the route connects Kazakhstan not only to China, but also to Azerbaijan, Georgia, Türkiye, and the European Union - at the same time, its effectiveness depends on customs harmonization, digitalized border procedures, and soft-integration measures alongside physical infrastructure. This indicates that the TITR is not merely a bilateral Kazakhstan-China channel. Rather, it is a multi-actor framework in which Chinese connections can remain economically valuable without becoming institutionally exclusive. The more actors acquire a stake in Kazakhstan's transit role, the stronger Astana's bargaining position becomes vis-a-vis any single partner (World Bank, 2023).

In this light, the Middle Corridor should not be read as evidence of an east-to-west geopolitical shift. It is better understood as an instrument of structural diversification. By expanding the country's range of routes, partners, and logistical options, Kazakhstan reduces the risk that any single external actor or transit route can dominate its geoeconomic orientation. Accordingly, the corridor supports the article's argument that Kazakhstan did not respond to asymmetry by disengaging from China, Russia, or other countries - rather, it reduced vulnerability through improved infrastructure and diplomatic alternatives. From this perspective, the TITR represents a concrete expression of structural compartmentalization: economic integration deepens, but within a broader architecture designed to preserve autonomy (World Bank, 2023; Shakirova et al., 2026; Kassenova, 2017).

Crises as Catalysts of Recalibration

Regional crises were not merely tests of Kazakhstan's multi-vector foreign policy - they also accelerated its recalibration. The 2014 crisis in Ukraine was the first major stress test of Kazakhstan's ability to preserve external flexibility under conditions of intensified polarization. As Neafie, Amanbaiuly, and Akhmer argue, Kazakhstan did not respond by collapsing into a polarized binary alignment with either Russia or the EU. Rather, it continued to pursue its own interests, while diversifying partnerships and supply routes in order to preserve its economic standing. In this sense, the post-2014 period showed that multivectorism could withstand external pressure - not through the avoidance of difficult political choices, but through the widening of the state's external options (Neafie et al., 2025).

The crises of 2022 were more severe and more consequential. Following the January unrest and the CSTO's temporary deployment, there was widespread concern that Kazakhstan's autonomy would shrink and that its dependence on Russia would deepen. These fears were further intensified

by Russia's subsequent invasion of Ukraine. The available evidence, however, points to a different outcome. Arynov notes that, despite early speculation about the end of multivectorism, Kazakhstan's foreign policy acquired even more visible contours after 2022. Yesdauletova et al. similarly show that Astana supported neither side and instead emphasized peace, reaffirmed respect for Ukraine's territorial integrity and for decisions grounded in the United Nations, and sought to preserve neutrality while adapting to a more unsettled geopolitical environment. At the same time, domestic developments revealed greater sensitivity to questions of sovereignty and greater political distance from Moscow than had been visible in 2014 (Arynov, 2022; Yesdauletova et al., 2024).

Taken together, the crises of 2014 and 2022 did not invalidate Kazakhstan's strategy of compartmentalization. After 2014, sovereignty and diversification became more prominent as safeguards against involvement in great-power confrontations. The same logic was sharpened after 2022 through selective neutrality in diplomacy, greater emphasis on route diversification, and the institutionalization of a more economically driven foreign policy under Tokayev. As Nyshanbayev et al. indicate, the Tokayev period did not abandon multivectorism, but rather institutionalized it more firmly and oriented it toward geo-economics. Crises, therefore, were not moments of strategic collapse but catalysts that exposed new vulnerabilities and pushed Kazakhstan to adapt its multi-vector foreign policy to a more adversarial regional environment (Nyshanbayev et al., 2024; Neafie et al., 2025; Arynov, 2022).

Conclusion: The Resilience of Strategic Compartmentalization

This article has argued that Kazakhstan's deepening economic engagement with China under the Belt and Road Initiative did not result in straightforward political dependence. Instead, Kazakhstan pursued a policy of strategic compartmentalization, through which it preserved foreign policy autonomy between 2013 and 2023 by consciously separating economic cooperation from political, normative, and security alignment. This finding diverges from conventional expectations derived from asymmetric interdependence, which would normally predict that expanding relations with a stronger power will narrow the policy space of the weaker state. In the Kazakhstani case, however, economic integration was not merely accommodated, but actively structured to safeguard diplomatic flexibility and preserve the country's broader multi-vector orientation (Kim, 2019; Contessi, 2015).

The analysis showed that this strategy operated across several interrelated dimensions. At the discursive level, cooperation with China and the BRI was framed primarily in developmental, technical, and transit-related terms, rather than as a basis for political alignment. At the structural level, Kazakhstan expanded alternative routes and logistical options, most clearly through the Trans-Caspian corridor, in order to reduce excessive reliance on any single transport route. At the strategic level, Kazakhstan's voting behavior in the UN General Assembly and its broader diplomatic posture reflected selective alignment, repeated abstention, and calibrated neutrality on politically divisive issues, with little evidence of automatic loyalty to either Beijing or Moscow. Taken together, these patterns suggest that China's economic role expanded within a broader

external portfolio that continued to include Russia, the EU, the United States, and regional partners (Sciorati, 2021; World Bank, 2023; Yuneman, 2023).

A further contribution of the study is to show that this pattern was not merely reactive. The concept of strategic compartmentalization was institutionalized more clearly under Tokayev in the 2020-2030 Foreign Policy Concept. The Concept preserved the core principles of multivectorism and continuity, but recast them in more explicit terms of economic diplomacy, regional leadership, diversification, and pragmatic national interest. In this sense, Kazakhstan's foreign policy did not become weaker as economic integration deepened - rather, autonomy was reproduced through an increasingly economic and implementation-oriented diplomatic framework (Web-1; Nyshanbayev et al., 2024).

This suggests that small and medium states are not always passive recipients of asymmetrical dependence. Under certain conditions, they can use economic interdependence when it is embedded in diversified partnerships, alternative infrastructures, and carefully managed official narratives. Kazakhstan's experience suggests that the durability of this model depends on its ability to balance expanding ties with China against the maintenance of broader institutional, diplomatic, and economic linkages. The evidence from 2013-2023 suggests that, so far, strategic compartmentalization has enabled Kazakhstan to convert integration into resilience rather than subordination (Thorhallsson, 2018; Haugevik and Rieker, 2017; Kim, 2019).

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TERRITORIAL DISPUTES IN THE SOUTH CHINA SEA AS A FACTOR OF REGIONAL DEVELOPMENT: SOCIO-ECONOMIC ANALYSIS

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Abstract

This study analyses the strategic significance of the South China Sea as one of the most important maritime regions in the world regarding geopolitical position, abundant natural resources, and global trade. From socio-economic perspective, this paper studies the territorial disputes in South China Sea and its influence on the regional development. China, Vietnam, the Philippines, Malaysia, Brunei and Taiwan all assert competing claims to islands in the South China Sea as well as fishing grounds and submarine areas such as the Spratly Islands and Paracel Islands. These tensions are steeped in historic claims, geopolitical interests, and competition for access to lucrative natural resources: oil, natural gas and fisheries.

This study investigates the impact that ongoing tensions and militarization in the region have on economic stability, maritime trade routes, and regional cooperation. Given that stability in one of the busiest maritime corridors in the world, one bearing a large percentage of global shipping, is essential for international commerce and energy security, it would also seem crucial to resolve conflicting territorial claims. Simultaneously, territorial disputes challenge sustainable regional development through stimulating political tensions, disrupting fishing activities, and hindering investment and economic collaboration between neighbouring countries. Moreover, the paper considers the role of international law and institutions, particularly the United Nations Convention on the Law of the Sea (UNCLOS), in addressing maritime disputes and promoting peaceful conflict resolution. Diplomatic negotiations, arbitration mechanisms, and multilateral cooperation are examined as potential pathways to reduce tensions and support regional stability.

This research concludes resolving disputes through legal frameworks and diplomatic engagement is crucial for maintaining economic growth, protecting maritime resources, and ensuring long-term stability in the South China Sea region.

Keywords: South China Sea Territorial disputes Spratly Islands Paracel Islands China Maritime trade routes Oil and gas resources UNCLOS

1. INTRODUCTION

The South China Sea has become one of the most geopolitically contested maritime regions in the world. It's also strategically vital. It sits between the Pacific and Indian Oceans. About one-third of global maritime trade passes through it. It is key for moving energy and for international commerce. The sea also holds big natural resources, like hydrocarbons and rich fisheries. That

raises competition among coastal states. Countries with overlapping territorial claims include China, Vietnam, the Philippines, Malaysia, Brunei and Taiwan. The Spratly and Paracel Islands are at the center of many of those claims. That mix has turned the region into a hotspot of geopolitical rivalry, militarization and legal disputes.

The authors work. This study looks at territorial disputes in the South China Sea and how they shape regional socio-economic development. The authors want to see how ongoing tensions hit economic stability and disrupt maritime trade routes and resource exploitation. And how they affect regional cooperation. The focus is on how geopolitical interests and economic dependencies interact with international legal frameworks. Especially the United Nations Convention on the Law of the Sea (UNCLOS). How that mix shapes conflict dynamics and possible paths to resolution.

The methods used. The research adopts a qualitative analytical approach, relying on the systematic review of academic literature, policy reports, and international legal documents. This approach enables a comprehensive assessment of historical developments, stakeholder interests, and the broader economic and political implications of the disputes. Through comparative and interpretive analysis, the study evaluates both the causes and consequences of regional tensions.

Results. Unresolved territorial disputes often lead to more militarization and political instability. They also disrupt economic activities like fisheries, trade and investment. But even with those ongoing tensions, economic ties between regional actors still shape how they cooperate and show restraint. International legal mechanisms and multilateral diplomatic efforts still play a role, but they don't fully work as tools for managing conflict.

Concluding discussion. The study shows peaceful dispute resolution is vital to long-term regional stability and sustainable development. It says states should follow international law and push for multilateral talks. And build stronger regional cooperation too to reduce conflict and protect the economic and strategic value of the South China Sea. The research helps us see how territorial conflicts tie into socio-economic development. It offers insights policymakers and scholars and other international stakeholders can use.

2. MAIN BODY

2.1. Historical background of the conflict: the main actors and their interests

The South China Sea is a semi-enclosed sea that enters the Pacific Ocean basin and is located on its western edge off the coast of Southeast Asia. It is located between the peninsulas of Indochina and Malacca, the islands of Kalimantan (Indonesia), Palawan and Luzon (Philippines), Taiwan and the coast of southern China. In the north, the sea is connected by the Taiwan Strait to the East China Sea, in the northeast by the Bashi, Luzon and Babuyang Straits to the Philippine Sea of the Pacific Ocean, in the south by the Karimata and Kelasa Straits to the Java Sea, and in the southwest by the Singapore and Malacca Straits to the Andaman Sea of the Indian Ocean. The sea surface area is about 3 million 537 thousand square kilometers. There are underwater uplands in the South China Sea, platforms with relatively shallow depths (less than 200 m). Some of them rise to sea level,

forming shoals, reefs and islands. Such platforms are located in the Paracel Islands area, as well as around and south of Scarborough Reef and Mcclesfield Bank Shoal. (1).

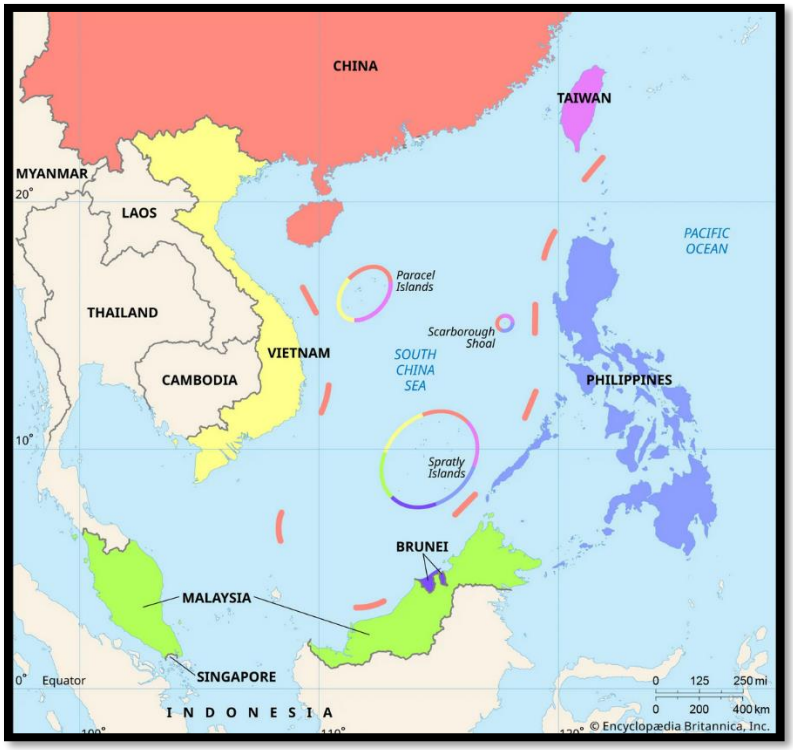


Figure 1. Areas of territorial disputes in the South China Sea

The Spratly Archipelago (Nansha Qiundao, China; Kuandao Truongsha, Vietnam; Kalayana, Philippines) is an atoll archipelago in the South China Sea, consisting of small land areas and reefs. Previously, the area of these islands was called "Coral Islands". The archipelago is located in the southwestern part of the South China Sea between the territories of Vietnam, the Philippines and Malaysia, almost 500 km south of the Paracel Archipelago - between 3° 40’ and 11° 55’ north and between 109° 33’ and 117° 50’ east. The total area of the archipelago area is more than 400 thousand. square kilometers of the South China Sea. The center of the area in which these islands and reefs are located is located about 400 km northeast of the northern coast of the islands of Kalimantan and Palawan and 500 km from the southern coast of Vietnam. The islands and reefs closest to Kalimantan and Palawan are located 30-60 km away. The distance between the Spratly Islands and the Paracel Islands is 700 km, and between the Spratly Islands and Hainan Island is 1000 km. From a physical and geographical point of view, the archipelago consists of more than 230 small islands, reefs, rocks, shoals and atolls scattered over a huge arc over 1, 000 km long along the southern edge of the South China Sea, the total area of which is approximately 5 square

kilometers, and taking into account island formations that temporarily appear above the sea surface - 10 square km, that is, in terms of land area, it is approximately equal to the Paracel archipelago. Many of them appear above the water only during low tide. Then their total number increases to about 400 (1).

The Paracel Islands (whale. Xisha-qiundao; Vietnam. Kuandao Hoangsha is an atoll archipelago in the South China Sea, consisting of small areas of land and numerous reefs. The archipelago is located about 230 km south of China (from the island of Hainan) and about 200 km east of the coast of Vietnam. It occupies a water area measuring approximately 250 × 100 km with coordinates from 15°35' to 16°50' north latitude and from 111°30' to 112°52' east longitude. From a physical and geographical point of view, the archipelago includes about 130 small coral islands, reefs, sand dunes and shoals (cans). The largest islands are Woody (2.1 square kilometers), Lincoln (1.6 square kilometers), Triton (1.2 square kilometers), Money (0.36 square kilometers) and Pattle (0.31 square kilometers). The total land area is about 7.8 square kilometers. All the islands are low (up to 14 m above sea level), composed mainly of coral sand and covered with stunted tropical vegetation. The climate is tropical, monsoon type. The archipelago is divided into two main island groups: Amphitrite (northeastern part) and Croissant (southwestern part) (2).

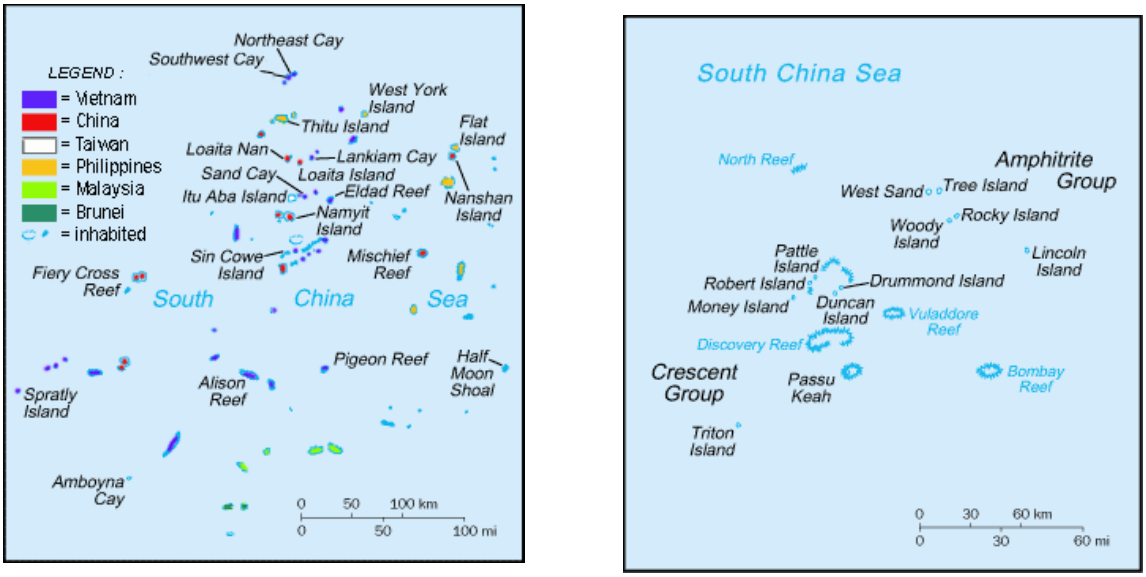


Figure 2: The Spratly Archipelago and the Paracel Islands

Territorial disputes in the region cover a number of States: China, Taiwan, Vietnam, the Philippines, Malaysia, Brunei and Indonesia. The most active position in the dispute in the South China Sea is occupied by China, Vietnam, the Philippines and Taiwan, which justify their presence on the islands or their claims based on various historical, legal and political grounds.

According to Chinese researchers, the Spratly Archipelago was known to the Chinese geographical tradition as early as the Han Dynasty (206 BC - 220 AD), probably from the 1st century AD. in particular, the Chinese side refers to a significant amount of historical materials. Chronicles, navigation records, and other written monuments from the Tang 618-907 and Sun 960-1279 dynasties containing information about the South China Sea are preserved. According to sources, in the Sun era A.D. Not only were economic activities conducted in this region (such as shipping and fishing) but also the armed maritime units of the Chinese State Guard. It is further indicated that during the Ming 1368-1644 and Qin 1644-1912 dynasties, the island territories in the waters south of Hainan Island were part of Hainan, which was part of Guangdong Province.

In the book "Book of Han" (汉书, Hanshu) of the Han Dynasty (and also Wu Zhi), specifically the chapter called Treatise on Geography (Hanshu Dizhi) (地理志) noted: "There are several small islands, dunes, reefs and beaches in the South Sea. This place is shallow, with lots of magnetic rocks..." This passage is unclear, as it refers only to a few small islands, but does not mention their specific names. The author Han Tian Hoa is of the opinion that Taisha (Paracel Islands, Viet. Hoang Sha) and Nansha (Spratly Islands, Vietnam. Truong Sha) in the book of Zuozhuan, written during the Spring and Autumn, it says: "The glorious Chu dynasty conquered the wild people to explore the area of the South Sea (islands) and make their property ..." The word "islands" author Jiang Mingsheng takes in parentheses to hint "South Sea" means "islands in the area South Sea" (3).

Vietnam also collected more than 30 maps that confirmed that the Chinese Ming and Qing dynasties did not recognize their authority over the islands in the South China Sea. These maps prove that the extreme border of China's territory is the island of Hainan and contains no mention of the islands of Xisha and Nansha. According to Vietnamese historians, the Vietnamese discovered or already knew about the existence of islands at sea since the 15th century and controlled them. These islands are mentioned in the "Collection of maps of routes to the Southern Lands." The Nguyen Princes (1558-1777), the rulers of the southern part of the Vietnamese territory, annually sent 18 ships to the islands to collect valuable materials on them. In 1530, some of the western islands of the Spratly region were visited by Spanish navigators. In 1606, they discovered the Spratly Island or some atoll lying to the southeast of it. In 1816, Vietnam's sovereignty over the Paracel and Spratly Islands was officially proclaimed by the Emperor of Vietnam. In the late 1920s, the Spratly Islands attracted more and more attention from the French authorities. The French sent ships on expeditions to explore the Paracel Islands (1925) and the Spratly Islands (1927). As early as 1930, a French military vessel was also sent to their waters with the task of constantly cruising in the area. In the spring of 1933, the armed forces of the Indochinese Union on three French ships took control of the seven main islands of the Spratly group, and on June 25 of the same year, a decree was issued notifying them of their annexation and the archipelago was declared French territory. France administratively incorporated the region into one of its colonies in Indochina. There were no protests in connection with this action. At the same

time, a meteorological station is being built there. The Spratly Islands area has been constantly patrolled by French warships since 1937. (2).

In 1939, Japanese troops occupied all the islands of the South China Sea, which remained under control until the end of World War II. Since Tokyo already had plans for broad expansion in the Pacific and Indian Oceans, the Japanese Navy was extremely interested in owning the Spratly Islands, which are of great strategic importance. In 1945, the Japanese evacuated from the islands. After the war, the French authorities focused on the general development of the situation in Indochina, caring little about the small islands of the South China Sea, especially since, neither economically nor militarily, the issue of the islands could in any way influence the course of the colonial war against the Vietnamese people, who proclaimed on September 2, 1945, the creation of a Democratic Republic of Vietnam.

During the Second World War, the French were driven out by Japanese troops who used the islands of the South China Sea as a springboard for the development of an offensive in Southeast Asia. After the surrender of Japan, the Chinese authorities installed signs of sovereignty on both archipelagos and garrisoned the islands of Woody and Itu Aba, which, however, were subsequently withdrawn with the beginning of the armed confrontation between the Kuomintang and the CPC in China. The priority of the issue of the ownership of the islands of the South China Sea on the foreign policy agenda increased dramatically after the establishment of the People's Republic of China in October 1949 in 1951. Premier of the State Council Zhou Enlai said that the islands of the South China Sea are part of China and should therefore be returned to China. (4)

In 1951, with the signing of the "Peace Treaty" (San Francisco), which summed up the results, including the territorial ones, which became the root of the conflict over the islands of the South China Sea. Until the early 70s of the last century, no one thought about the islands, as they were of no interest due to their meager size and uninhabitability. In 1969, the United Nations established a special research committee to determine oil reserves in the South China Sea. The committee's conclusion was that it was one of the richest areas in the world in terms of oil and gas reserves. (5).

While the claims of China and Vietnam in the South China Sea are based on historical grounds, the claims of the Philippines are based on the results of research conducted by specialists back in 1956. They came to the conclusion that the 8 islands located off the Philippine coast are not at all part of the Spratly Archipelago, but belong geographically to the territory of this island state. Manila currently exercises administrative control over Titu Island, the second largest natural island in the Spratly Archipelago, and is seeking to strengthen its sovereignty through the construction of new infrastructure.

Malaysia's demands are in many ways similar to those of the Philippines. Based on the conducted research, it was established that the three islands of the Spratly Archipelago are a continuation of the Malaysian continental shelf. Based on this, Kuala Lumpur occupied these territories and built a hotel on one of the islands to develop tourism activities. In 2013, China deployed a coast guard vessel off Cape Luconia, which Malaysia claims and which is located in its

exclusive economic zone. The Prime Ministers of Malaysia have repeatedly raised this issue in dialogue with the Chinese side, as a result of which Beijing has withdrawn and returned its ship to the area.

Indonesia, in turn, positions itself as a state that has no territorial disputes in the South China Sea. However, its exclusive economic zone includes the area of the Natuna Islands, located in the immediate vicinity of the so-called "nine-dash line" designated by China. Despite the fact that Beijing recognizes Indonesia's sovereignty over the Natuna Islands, incidents periodically arise between the countries related to the entry of Chinese fishing vessels into the exclusive economic zone of Indonesia (6). In cases where Chinese fishermen approach the Natuna area, Jakarta expresses an official protest. In 2016, after another incident, Indonesia sent warships to the area. Indonesian President Joko Widodo (Jokowi) personally visited the Natuna Islands to demonstrate sovereignty and control over the situation. (7).

2.2. The economic importance of the region

The South China Sea is widely regarded as one of the most strategically important and volatile island clusters in the modern international system. China’s persistent militarization of the region, overlapping maritime claims advanced by six states, and, notably, the United States’ increasingly assertive posture toward Beijing have elevated tensions. As a result, the area has drawn global attention as a potential nuclear flashpoint with serious implications for international security. The fact of the matter is that South China Sea has an extensive array of geo-political, economic and military significance for the contesting nations in specific as well as the globe in general. Moreover, to top it all off, the two superpowers of the world, United States and Socialist Republic of China are racing for hegemony in the evolving multi-polar world of 21st century and South China Sea, with all its wealth and strategic significance, lies in the middle of that struggle. Hans Morganthau said; «International politics, like all politics, is a struggle for power. Whatever the ultimate aims of international politics, power is always the immediate aim».

The U.S. Energy Information Agency estimates that the South China Sea holds about 190 trillion cubic feet of natural gas and 11 billion barrels of oil in proved and probable reserves, most of which lie along the margins of the South China Sea rather than under disputed islets and reefs. The U.S. Geological Survey in 2012 estimated that there could be another 160 trillion cubic feet of natural gas and 12 billion barrels of oil undiscovered in the South China Sea. Beijing’s estimates for hydrocarbon resources under the sea are considerably higher but still modest in relation to China’s overall demand-the country’s oil consumption in 2018 is expected to top 12.8 million barrels per day (8).

This region contains some of the most significant shipping lanes of the world which are indispensable for the smooth flow of global trade. The main lane of shipping spreading between the Pacific and Indian Ocean ports is carried out through the Strait of Malacca and the South China Sea. During this trading, oil and mineral resources are shipped towards north whereas food and

manufactured goods move towards the south. These maritime lanes are the jugular veins of international flow of capital and goods and therefore, the economic significance of the South China Sea is self-evident. However, the discussion regarding the economic value of this region is not restricted to its strategic location rather there are other avenues of fiscal significance as well. South China Sea is a source of untamed and unexplored natural resources embedded in its seabed. There is a wide variety of resources that the legitimate sovereign state will have every right to explore and exploit. One of those boundless resources is the abundance of marine life. South China Sea is full of fishery of all sorts and kinds. Major kinds of sea fauna include various species of tuna, mackerel, croaker, anchovy, shrimp as well as shellfish. This collection of sea food is the main source of marine animal protein to the region of Southeast Asia (9).

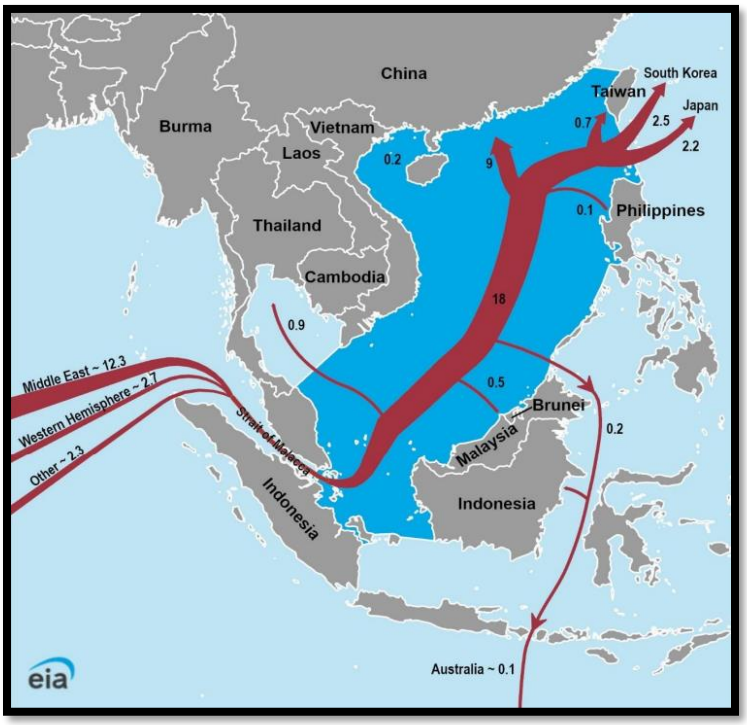


Figure 3. South China Sea crude oil trade flows in million barrels per day, 2023 (10)

In these circumstances, China understands that it cannot guarantee the security of its maritime transportation routes, which account for 90% of its oil imports and 80% of its foreign trade. The maritime routes that run from China through the Taiwan Strait, the South China Sea, the Indian Ocean, and North Africa are becoming increasingly important.

The United Nations Conference on Trade and Development (UNCTAD) estimates that roughly 80 percent of global trade by volume and 70 percent by value is transported by sea. Of that volume, 60 percent of maritime trade passes through Asia, with the South China Sea carrying an estimated one-third of global shipping.1 Its waters are particularly critical for China, Taiwan,

Japan, and South Korea, all of which rely on the Strait of Malacca, which connects the South China Sea and, by extension, the Pacific Ocean with the Indian Ocean. As the second-largest economy in the world with over 60 percent of its trade in value traveling by sea, China's economic security is closely tied to the South China Sea. As a vital artery of trade for many of the world's largest economies, the South China Sea has garnered significant attention. The high concentration of commercial goods flowing through the relatively narrow Strait of Malacca has raised concerns about its vulnerability as a strategic chokepoint. Writings on the South China Sea frequently claim that $5.3 trillion worth of goods transits through the South China Sea annually, with $1.2 trillion of that total accounting for trade with the U.S (11).

On March 28, 2015, Chinese President Xi Jinping detailed his vision for the Silk Road Economic Belt and the 21st-Century Maritime Silk Road (herein-after referred to as the Belt and Road) when attending the Boao Forum for Asia. After that, China's National Development and Reform Commission, Ministry of Foreign Affairs, and Ministry of Commerce jointly issued the "Vision and Actions on Jointly Building Silk Road Economic Belt and 21st-Century Maritime Silk Road", a sign that the Belt and Road Initiative promoted by China as a foreign cooperation platform entered its first year of implementation. This vision covers over half of the global population and involves more than 60 countries along the routes, the economic aggregates of which account for about one third of the world (12).

Indeed, the Road is destined to serve a range of China's core interests, these include the development of its more than $1.2 trillion blue economy, improving food and energy security, diversifying and securing sea lines of communication (SLOC), upholding territorial sovereignty and enhancing its international discourse power. The Road has the potential to expand China's maritime strategic space far beyond its enclosed adjacent waters and allow it and Road-participating states to co-shape the changing global maritime order. Within this construct, China, like previous and existing powers, is seeking to reduce the impact of disruptive forces on key supply chains - in that sense the Road is not anomalous. The initiative will allow China to build resilience into economic or diplomatic isolation that could negatively impact its economy and subsequently domestic stability. In the SCS, China's maritime renaissance, bolstered by the Road, adds to the security complexity of these regions. These are security spaces that are more contested by regional and extra-regional players than the Belt's most strategic regions. In the SCS, the Road is attractive to most states belonging to the Association of South East Asian Nations (ASEAN), given the association's strong interest in improved connectivity, economic opportunities and healthy ties with China (13).

In a geopolitical context, the South China Sea can be viewed as a unique strategic arena. The key rivalry in this arena is primarily between China and the countries of Southeast Asia. In addition to its interest in the natural resources of the seabed and the geographical significance of the region itself, China's long-term strategy is aimed at strengthening its influence in Southeast Asia and establishing a dominant position through constant political, economic, and military pressure. At the same time, external actors - Australia, Japan, the United States, and a number of European

states - are also involved in these geopolitical dynamics. They believe that their security could be threatened if China succeeds in rebuilding relations with Southeast Asian states based on a hierarchical model that contradicts the principles of sovereign equality of states and the norms of international law. These countries are also worried about China's desire to limit the presence of non-regional powers' armed forces in the South China Sea, which explains their focus on upholding the principle of freedom of navigation. At the same time, their military and political presence in the region is largely based on diplomatic and political support from Southeast Asian states, which lends legitimacy to their participation in regional security.

The South China Sea conflict is no ordinary dispute over territorial waters, for this regional conflict has the confrontational involvement of two superpowers of the world- USA and China. It is due to the forceful and sometimes threatening stance of China over the territorial sovereignty of South China Sea that the super power of the world, United States of American, has been an active non-claimant participant in this tug of war. While China reinstates its claim over the region through the “Nine Dash Line” narrative, United States holds the primacy and supremacy of the International Law in determining the territorial limitations for each State adjoining the South China Sea. United States of America has a long list of security agreements in East Asian region and the alliance of United States ranges to a number of states that geographically border the South China Sea. These States include the Philippines, Singapore and Vietnam. The US has wide-ranging security commitments in East Asia, and is allied with several of the countries bordering the South China Sea, such as the Philippines, Singapore and Vietnam (9).

The maritime space of the South China Sea has become a focal point of extensive militarization and military alliance activities among the major stakeholders in the region. One of the primary drivers of the increased defense expenditures by many countries-particularly China-is Beijing’s effort to counter what it perceives as growing U.S. encroachment in its strategic neighborhood. The United States, however, maintains that the South China Sea, including the strategically important Spratly Islands, lies largely within international waters. In addition, the sea lanes of the South China Sea represent a crucial strategic corridor for military operations. This is largely due to the regular transit of the United States Seventh Fleet between the Pacific and Indian Oceans, which requires secure maritime routes to ensure operational mobility. At the same time, the region also serves as an important potential military platform for China in the event of a large-scale conflict with rival powers. Therefore, in the scenario of a direct military confrontation between the United States and China, the strategic importance of the South China Sea would be extremely significant (9).

2.3 The socio-economic consequences of territorial disputes and settlement

Conflicts between countries can have significant impacts on their trade relations. Realism, a mainstream theory in the study of international relations, suggests that international systems are inherently conflictual where every country struggles for their national interest, making cooperation

among them difficult. Countries prioritise power and security above all to maximise their influence for survival. Proponent of this theory like Morgenthau and Waltz maintain that countries would strengthen their military power to ensure their national interests are met. This situation causes growing distrust among countries, and when they are in conflict, trust between them becomes worse. Each action is viewed with suspicion, making it difficult to trust promises or intentions of cooperation. This creates a vicious cycle where cooperation seems risky and fuels further distrust and countries' efforts to restrict trade with their opponents. Military hostility may discourage economic cooperation and the signing of preferential trade agreements. Their government would likely possess various policy tools such as breach of contract, repatriation of profits, exchange controls, entry and exit restrictions, and embargoes, as well as other import and export controls. In a worse scenario, trade disruption during wars can result in significant economic losses (14)

China's assertive actions in the SCS, such as land reclamation and militarization of islands, have significantly heightened tensions with ASEAN claimant countries, particularly with the Philippines, Vietnam, Malaysia, and Brunei. These heightened tensions have resulted in numerous military stand-offs, primarily between China and Vietnam, as well as the Philippines.

Since 2013, China has begun large-scale land reclamation work to expand the territory of the islands it controls in the South China Sea. Thus, by 2016, the total area of the 7 reefs of the PRC in the Spratly increased to 13 square kilometers, which is 2.5 times the natural area of this archipelago. The PRC has permanent garrisons on all of its reefs in the Spratly Islands. The necessary military infrastructure has been created on the artificial islands, including radars, anti-aircraft missile systems, helicopter pads, barracks, deep-sea ports, and runways have been built on the reefs of Fiery Cross, Subi, and Mischief.

China already has an airfield on Yongxing Island in the Paracel Islands, and satellite images show that another one is being built on Triton Island. In addition, since the early 2000s, China has established a large Yulin naval base on Hainan Island, near the city of Sanya. There is a berth and dry dock for aircraft carriers, an underground base for submarines, as well as anti-ship and anti-aircraft missile systems. Hainan also has three large military airfields (15).

China and the Philippines are pouring money into military stuff and building projects because they are rivals over who controls the South China Sea. It seems like this rivalry is getting pretty intense. China has spent tens of billions on things like bases and fake islands, plus all sorts of weapons. They keep pushing that forward. The Philippines is not just sitting back though. With help from the United States, they are updating their military and fixing up infrastructure to get ready for joint stuff with allies and to protect those areas everyone argues about. I think that support makes a difference, but it is hard to say how much. The whole area feels really tense right now. Things could blow up from just one small incident, and that unpredictability is what worries me the most. It is like everything is on edge, waiting to see what happens next.



Figure 4. Woddy island, Fiery Cross, Subi, and Mischief reefs

Second Thomas Shoal is a coral reef in the Spratly Islands archipelago that is the subject of a territorial dispute among several countries. Since 1999, the Philippines has maintained a military presence there, stationing marines on the old landing ship BRP Sierra Madre, which was deliberately run aground to assert control over the reef. Things have gotten a lot more tense around the reef since 2021. The Chinese coast guard and their maritime militia ships are always out there now, blocking the Philippine supply runs. Those missions are just trying to get food, water, and gear over to the people stationed on the BRP Sierra Madre. It seems like this happens pretty much every time.

In recent years, China has begun to employ so-called «gray-zone» pressure tactics-methods that do not constitute a direct armed attack but exert significant pressure on the adversary. Such actions include: ramming and ship collisions, using water cannons, laser blinding of crews and blocking supply routes.

A particularly serious incident occurred on June 17, 2024, when Chinese vessels surrounded a Philippine supply mission. During the confrontation, China Coast Guard cutters and their supporting vessels rammed and surrounded the Philippine boat, boarded one of the inflatable boats, and damaged equipment with knives and axes.

Since 2021, there have been around ten recorded incidents of force being used against Philippine resupply missions, according to studies. This alone translates to about 26% of the total

number of resupply operations done by the Philippines around said reef. But China has only been able to completely disrupt the mission twice — in 2021 and 2024. China had also switched its approach in 2024: small high-speed boats are now used more widely than a large number of larger vessels, which can quickly surround Philippine ships and intercept cargo deliveries to the reef. Such craft are deployed from interdiction ships and enable more aggressive, maneuverable operations. But after the June clash, China and the Philippines struck a temporary deal in July 2024 aimed at defusing tensions and regulating supply missions. However, the parties quickly started interpreting the terms of that agreement differently, raising questions about its durability (16).

Date	**Use of force**	**Effects**	**Outcome of mission**
November 16, 2021	Water cannon	One of the ships had its outrigger broken	Failure
February 6, 2023	Blocking, laser	One crew member suffered temporary blindness from the laser	No report on the outcome of the mission
August 5, 2023	Water cannon	N/A	Success
October 22, 2023	Collisions	Supply boat Unaiza May 2 was damaged	Success
November 10, 2023	Water cannon	N/A	Success
December 10, 2023	Water cannon, collision	Supply boat M/L Kalayaan's engines suffered severe damage; BRP Cabra suffered damage to its mast	Success
March 5, 2024	Water cannon, collisions	Supply boat Unaiza May 4's wind shield shattered and four personnel onboard sustained minor injuries	Success
March 23, 2024	Water cannon	Supply boat Unaiza May 4 suffered severe damage and personnel onboard sustained injuries	Success
May 19, 2024	Ramming, collisions	N/A	Partial Success - Some Philippine supplies were seized
June 17, 2024	Water cannon, collisions, ramming,	One RHIB's side floaters were slashed	Failure

	towing, boarding, lasers, throwing rocks, tear gas, strobe lights, hammers	and deflated; another RHIB's windshields and navigational screens shattered; eight personnel suffered injuries, including one who lost their right thumb	

Table 1: Event analysis of Chinese Use of Force at Second Thomas Shoal

China has become Malaysia's largest trading partner, and economic ties between the two countries have expanded rapidly. In 2024 bilateral trade reached about US$212 billion, showing the depth of their economic interdependence. While economic cooperation has flourished, territorial disputes continue to be a top source of tension between China and Malaysia. China claims much of the South China Sea under a sweeping "nine-dash line" that is not recognized internationally. Malaysia, though, denies this assertion and claims it violates international custom and UNCLOS. Luconia Shoals is one of the key disputed areas, lying within Malaysia's Exclusive Economic Zone (EEZ) and crucial for oil and gas resources run by Malaysia's state energy company PETRONAS. However, tensions have increased because: Chinese coast guard vessels frequently patrol the area, Chinese ships often remain near Malaysian offshore energy facilities, Malaysia has issued diplomatic protests over these incursions. These actions are seen as part of China's broader strategy to assert control over disputed maritime territories. Malaysia traditionally follows a cautious diplomatic approach toward China. Prime Minister Anwar Ibrahim has emphasized that Malaysia maintains friendly relations and has "no problems" with China publicly. However, soft diplomatic tone contrasts with increasing Chinese maritime activity near Malaysian waters. Passive diplomacy could weaken sovereignty, especially if Malaysia does not actively demonstrate control over disputed areas. A historical example is the territorial dispute over Pedra Branca, where Malaysia lost its claim partly because it failed to show consistent administrative control (17).

There have been many cases where disputes at sea lead to fishing problems:

- On 2 February 2010 a Chinese patrol boat stopped and boarded a Vietnamese fishing craft and seized its catch, navigational aids, spare parts and tools.

- On 22 March 2010 Chinese patrol boats detained a Vietnamese fishing boat and its twelve-member crew who were sheltering near Woody Islands in the Paracels. Chinese authorities demanded payment of a U.S. $10,000 fine. This prompted a protest by Vietnam on 30 March.

- On 13 April 2010 a Chinese naval patrol seized a second Vietnamese fishing boat and its crew of nine near Da Loi island (near the Paracels) and demanded payment of a U.S. $10,000 fine.

- On 4 May 2010, Chinese Fishery Administration officials seized a Vietnamese fishing boat in the Paracel archipelago and demanded a fine of U.S. $8,000. In June, China seized three

Vietnamese fishing boats and arrested the crew in waters east of the Gulf of Tonkin and near the Paracel Islands.

- On September 11 2010 China seized a Vietnamese fishing trawler and arrested its crew of nine in waters near the Paracels. Four days later, China officially notified Vietnam that the boat had been seized for violating China's territorial waters and the crew detained (18).

Some experts say that conflict in the SCS does not really impact the overall trade volume between China and ASEAN. There are several main reasons that explain this phenomenon. First, China has a long history of trading with ASEAN. China and Southeast Asia have traded since the 3rd century BC, with the maritime Silk Road connecting their coasts. And China's efforts to strengthen economic relations with Southeast Asia in the 1950s and 1960s, the Cold War and China's self-reliance policy kept trade volumes modest. Indirect trade existed through Hong Kong and its border trade. The trade boomed again following improved relations and China's economic reforms in the 1970s. For example, the total trade jumped from $763 million in 1950 to $1.9 billion in 1980. China's improved relations with Southeast Asia opened the door for rapid trade growth. Between 1991 and 1995, trade increased by more than 20% annually, and this trend continued into the twenty-first century, spurred by China's WTO membership and deeper economic integration. And one more is business becomes apparent, where economic ties persist despite political tensions (14).

Indeed, interconnection of the nations by the economy won't lead to any regional or global war, however territorial disputes in the South China Sea could have a significant impact on the global economy and the structure of international transport routes. First, this region is one of the key hubs of global maritime trade. A significant portion of global cargo transportation passes through the South China Sea. This includes oil, natural gas, raw materials, and finished products delivered to countries in East Asia, the Middle East, and Europe. Therefore, increased tensions or military confrontation in the region could jeopardize freedom of navigation and the stability of international trade flows. An escalation of the conflict would increase the risk of restrictions or complications in navigation in central maritime transport arteries. This would lead to an increase in the cost of maritime transport, undermine insurance rates for shipping companies, and cause an increase in delivery times for goods. In the event of a serious escalation, a number of states and commercial organizations will begin to look for alternative routes, which will negatively affect the existing logistics system.

Experts believe that the South China Sea could become a major conflict zone. This region is very important because many ships carrying goods pass through it, and there are large reserves of oil, gas, and valuable fish. Several countries, including China, Vietnam, the Philippines, Malaysia, and Brunei, claim that this territory belongs to them. This is causing great tension in the region. If a conflict breaks out, it could start with a minor incident. For example, there could be a collision between fishing boats or military ships. Such incidents often occur near disputed islands, such as the Spratly and Paracel Islands. Countries try to show that this territory belongs to them and build military bases there. For example, if one country detains another country's fishing vessel, it could

lead to a major diplomatic scandal. The same could happen if ships from different countries collide, or if one of the countries starts drilling for oil in a disputed area. Such actions could very quickly damage relations between countries.

In the second stage of the conflict, the countries begin to increase their military presence. They are sending more warships, increasing the number of patrols and conducting military exercises. This shows that they are ready to defend their interests and put pressure on the enemy. Other powerful states, such as the United States, may also intervene, especially using its 7th Fleet. They usually support freedom of navigation and help their allies in the region. A limited armed conflict may begin. This may include warning shots, ship hijackings, or short naval engagements. Although both sides usually do not want a full-scale war, even such limited clashes can lead to serious consequences and attract new participants. When there are many military personnel in the region, the risk of accidental incidents increases greatly.

At the fourth stage, the conflict may become regional. This will lead to safety problems on the sea routes, which will greatly affect the global economy. Most international trade passes through the South China Sea, including oil and goods shipments between Europe, the Middle East, and East Asia. If shipping is restricted, this could lead to increased transportation costs, supply problems, and higher energy prices.

The last stage of a crisis usually involves international diplomatic intervention. International organizations such as the United Nations and the Association of Southeast Asian Nations can participate in conflict resolution to help negotiate and prevent further escalation. The main ways to stabilize the situation are through diplomatic negotiations, international mediation, and temporary cease-fire agreements.

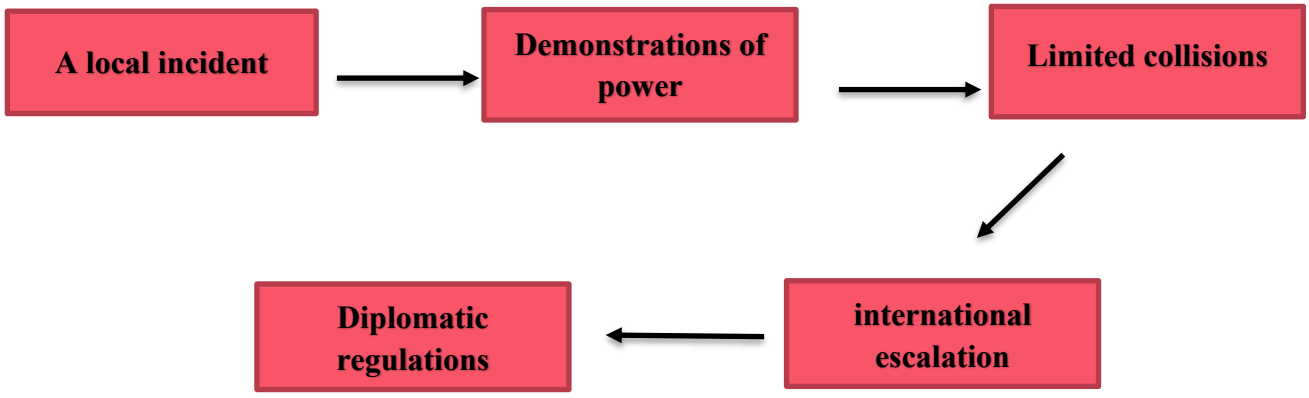


Table 2: The order of a possible conflict event

For a long time, the countries participating in the South China Sea have been negotiating to resolve the conflict at sea, but without success. Since the negotiations were mostly bilateral, but as a result of the negotiations, China had more advantages against the competitors. To resolve a conflict, negotiations must be multilateral and involve a third party or mediators. And one of the most effective ways is to use the norms of international law, primarily the provisions of the UN Convention on the Law of the Sea.

UNCLOS III is an international agreement which established standards and legal methods for securing navigation rights and pro vided access and management to natural resources of the ocean. The agreement expanded "the right of nations to claim both sovereignty and sovereign rights further to sea." One of the major accomplishments of the Convention was defining and limiting the jurisdictional areas of the sea from the baseline of the coast: the territorial sea, twelve nautical miles ("nm") from the baseline; the contiguous zone, twelve to twenty-four nm from the baseline; the exclusive economic zone ("EEZ"), two hundred nm from the base line; and the high seas. These distinct areas would give exclusive rights or sovereignty (or both) upon the coastal nation, with greater proximity to the defined baseline of the coastal nation yielding a greater degree of sovereignty and control over the area.

UNCLOS III also mandated a choice of procedure provision for settling disputes between parties to the Convention: the parties are first directed "to settle disputes by peaceful means," which may include "negotiation, enquiry, mediation, conciliation, arbitration, judicial settlement, resort to regional agencies or arrangements, or other peaceful means of their own choice." If the parties have a dispute concerning the interpretation or application of the Convention, then they are directed to choose a means for a binding decision to be made. The parties indicate their choice of procedure upon signing UNCLOS from the following options:

(a) the International Tribunal for the Law of the Sea established in accordance with Annex VI;

(b) the International Court of Justice;

(c) an arbitral tribunal constituted in accordance with Annex VII;

(d) a special tribunal constituted in accordance with Annex VIII for one or more of the categories of disputes specified therein (19).

UNCLOS standards, as discussed above, are improvements of the previous versions of the Convention, and are regarded as the "codification of the contemporary customary international law of the sea." With the establishment of EEZs and dispute resolution methods, the Convention provided guidelines for coastal nations in establishing claims, exercising rights, and resolving disputes. In theory, even a conflict in a heavily disputed region such as the South China Sea should be resolved if the parties complied in good faith with UNCLOS provisions. The remaining problem is that the parties are not willing to fully cooperate because doing so may undermine their

overlapping claims to the area. The obvious issue that requires parties' cooperation, is that the South China Sea is densely surrounded by multiple different countries, allowing for overlapping claims to the area. The Convention's rules do not provide further guidance for such conflicts. The purpose of UNCLOS is to apportion the maritime entitlements equitably, not to provide windfalls for any one party. The decision highlighted UNCLOS's quasi-court function and its policing goals instead of merely providing for an alternative dispute resolution forum (19).

After the tribunal made its call, China jumped right into these bilateral talks, figuring they could handle the South China Sea issue on their terms. It's a way they are used to, and yeah, it makes sense for countries dealing with each other directly. But over time, those kinds of negotiations haven't really gone anywhere for them. I mean, China keeps pushing because they are so sure their claims are right, which makes talks tough. Like with Vietnam over the Paracel Islands, where things just dragged on without much give. It feels like they might be stuck in that pattern again, sort of. Past efforts show how stubborn it gets when they dig in like that. For this reason, negotiations should be conducted multilaterally so that all parties to the conflict are on an equal footing and under the supervision of third parties.

Mediation (from Latin. Mediare - to reconcile) is one of the methods of conflict resolution, the essence of which consists in voluntary negotiations between the conflicting parties with the participation of an independent mediator. The main features of mediation as a method of conflict resolution are the following:

1) the conflicting parties enter into negotiations with each other;

2) in addition to the parties to the conflict themselves, a third party takes part in these negotiations - an intermediary (who is called a mediator), who organizes and manages the negotiation process.;

3) the negotiations of the parties are based on a special technology developed in accordance with the "Harvard method" of conflict resolution. The foundations of the "Harvard method" are laid in the works of American conflict scientists R. Fisher and W. Urey, who described the principles of conflict resolution based on an analysis of the interests and needs of the conflicting parties (20).

For the parties, the most important thing is not the "history" (of relationships, resentments), not what is connected with the past, not mutual claims, but the future - the future needs of the opponents, the possibility of maintaining a positive or at least neutral relationship. The parties to the conflict have long-term relationships with each other, and the parties to the conflict would prefer to resolve the issue in a confidential manner, without bringing the dispute to public hearing (21).

Arbitration is a private dispute resolution process where parties in conflict hire a third party neutral(s) to hear their stories, look at the facts, and make a decision for them on how the dispute will be resolved. Arbitration is essentially contractual and is generally used in a wide range of commercial settings to deal with conflicts that arise under contractual agreements. Arbitration is a private, less formal, and more expeditious form of adjudication (judicial procedure to hear a

dispute) that enables disputing parties to reach a binding decision similar to a court judgment, while relieving the courts of case overload. In some instances, the parties have the chance prior to the arbitration to decide whether the results will be binding upon them or non-binding. In other contexts, binding arbitration may be contractually binding despite one party's lack of bargaining power, as when consumers "agree" to be locked into binding arbitration (in lieu of a court remedy) via their purchase contracts with commercial vendors. A binding process means the results of the arbitration are a contract between the parties that is enforceable in a court of law. A non-binding arbitration follows all the same steps as a binding process except that the decision by the arbitrator is considered a suggestion. Parties are free to use the suggested decision to make their agreement final or to simply use the process as a dress rehearsal to get a sense of what may happen in a formal court procedure. Unlike mediation, information uncovered in arbitration is not typically held as confidential. Although an arbitrator may be called into court if there is compelling evidence of unfairness, or a denial of justice, the merits and methods of decisions made by the arbitrator are rarely questioned by the courts (22).

Med-arb should be generally applied to maritime disputes in Asia to overcome the lack of constructive enforceability of arbitral decisions under UNCLOS. Due to a strong sentiment against an unfamiliar panel deciding on behalf of the parties, arbitration should be, in most cases, a last resort proceeding following an ample opportunity for parties to communicate their goals and negotiate. There should be a categorization of disputes and appropriate ADR methods or adjudication recommended for each type of dispute. The entire process also guarantees a smoother transition from mediation to arbitration, which the parties would be more open to if they had already tried mediation together and failed to come to agreement or failed to resolve all the issues. Instead of issuing an arbitration ruling, which may reward one winner and alienate the other party, allowing the parties an opportunity to come to terms on their own with a neutral facilitator can be much more effective. By replacing the default dispute resolution method, the Convention would ease the prospect of going into the process, open up the parties to facilitated discussions of their goals and concessions, and in case there is no conclusion, guide them until the end under UNCLOS guidelines. China never consented to resolving its conflict with other claimants through the arbitration tribunal and cited many obstacles in submitting to the tribunal in the first place. A high-pro file or controversial matter warrants as much cooperation and compliance as possible. Mediation, due to its non-binding nature, makes the option more attractive and risk-averse, which the parties are more likely to be open to. This encourages a consensual and bilateral atmosphere, which is largely what was lacking in the South China Sea dispute resolution process. When the par ties are two sovereign nations, they must both be willing to sit down and go through the process together, and such a mindset and commitment is likely to be carried into arbitration in a med-arb process. A high-stakes conflict calls for greater security and predictability in the proceedings due to the risk-averse attitudes of the parties (19).

Conclusion

The territorial controversies of South Sea China is a complex integration between geopolitical, economic and law issues that could be highly impact the whole development process of regional stability. The analysis shows that competing claims about maritime territory and resources have escalated conflicts among aspiring states while the regional geostrategic importance for global trade and energy transportation raises the stakes of the conflict. In addition, the South China Sea is also an essential element for the economic development of the Asia-Pacific region due to its rich natural resources and important maritime channels.

The results suggest unresolved disputes could drive ongoing militarization, economic volatility and disrupted regional cooperation. Such tensions can have adverse impacts on fisheries, maritime trade and investment flows thereby inducing socio-economic repercussions not only for the claimant's states but also for the international community at large.

There is a practical angle also: bolstering commitment to international law, notably the United Nations Convention on the Law of the Sea (UNCLOS), is an important element both in managing disputes as they arise and in preventing escalation. Real Conflict Resolution Methods Are Always: It is correct to use diplomacy, multilateral negotiations and legal mechanisms such as arbitration and mediation. Strengthened collaboration between regional organizations and external stakeholders can also promote stability and the sustainable use of maritime resources.

In conclusion, long-term regional stability in the South China Sea depends on the willingness of the involved states to prioritize cooperation, respect international legal norms, and pursue peaceful mechanisms for dispute settlement. Such approaches are crucial for protecting economic interests, ensuring maritime security, and supporting sustainable regional development.

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The Impact of Corruption and Innovation on Sustainability Effort in Emerging Economies

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Abstract

This study investigates the effect of corruption on firms' sustainability efforts and innovative performance in post-Soviet economies in transition. It examines whether corruption constrains or facilitates ("grease-the-wheel") firm-level innovation and sustainability outcomes. The analysis draws on data from the 2023-2024 World Bank Enterprise Survey, covering ten post-Soviet countries: Armenia, Azerbaijan, Estonia, Kazakhstan, Kyrgyzstan, Latvia, Moldova, Tajikistan, Turkmenistan, and Uzbekistan. A stratified random sampling method was employed to select firms, and the special regressor technique was applied to test the research hypotheses. Results indicate that the relationship between corruption and sustainability efforts is statistically significant and negative. In contrast, corruption has a positive effect on firm innovation, providing evidence for the "grease-the-wheel" effect in transition economies. Furthermore, a positive relationship between innovation and sustainability was identified, suggesting that firm innovation effort will also lead to sustainability initiatives. This evidence reinforces the continuing discussion that accumulated innovation expertise may empower firms to undertake sustainability efforts regardless of the institutional constraints present in emerging markets. The findings provide important insights for managers and policymakers in transition economies. While corruption may encourage innovation in the short term, it does not necessarily support sustainability. Governance reforms and targeted innovation policies are needed to ensure that innovation contributes to long-term sustainable development.

Keywords: corruption, innovation, sustainability, transition economies

The Moderating Effects of ICT Development on the Relationship between Digitalization and Sustainability in Emerging Countries

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Abstract

The world's recent shift toward digitalization has compelled nations to enhance their ICT development, especially those striving to catch up with more advanced economies. This study examines the impact of digitalization and ICT development levels on sustainability efforts across nine nations from the post-Soviet bloc including Azerbaijan, Armenia, Kazakhstan, Kyrgyzstan, Latvia, Moldova, Estonia, Uzbekistan. The analysis is based on the 2024 World Enterprise Survey data (World Bank). The results show that although the level of ICT development is significantly positively related to firms' sustainability efforts, the expected digitalization impact on sustainability is partially supported. In addition, our findings indicate that ICT development is having a moderating effect on the relations between digitalization and sustainability effort at the firm level: high ICT development amplifies the positive impact of digitalization on sustainability efforts and lower ICT development leads to notably negative relations between digitalization and sustainability. These findings underscore the critical importance of ICT development for advancing sustainability efforts at the firm level.

Keywords: Sustainability, ICT development, Digitalization, Emerging economies, post-Soviet block, CIS countries.

Character Education in Kazakhstan Higher Education: A Comparative Framework Analysis for Sustainable Value in the Digital Era

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ABSTRACT

Kazakhstan's higher education system continues to pursue modernization, international alignment, and stronger graduate outcomes. At the same time, rapid digitalization and the spread of artificial intelligence tools are reshaping how students learn, communicate, and make ethical judgments in academic settings and beyond. Within this context, universities face growing pressure to create sustainable value by preparing graduates who demonstrate ethical reasoning, civic responsibility, and socially constructive behaviour. Recent public discussion around the school subject Self-Knowledge (Samopoznanie) also suggests that values-based education remains under active review in Kazakhstan, as the Ministry of Education explained that the subject was being considered for possible transfer from the list of compulsory subjects to an elective format while curriculum updates and workload reduction were being reviewed (Web-1). Recent scholarship suggests that character education in Kazakhstan should be understood as more than an imported policy agenda. Instead, it is increasingly articulated through indigenous moral and philosophical resources, especially Abai-inspired concepts such as Tolyk Adam, together with broader axiological approaches to education and identity formation in the digital age (Dauyenov et al., 2022; Makhmetov, 2025; Madiyeva et al., 2025). This extended abstract therefore compares two orientations relevant to Kazakhstan higher education: North American character education models, which often emphasize autonomy, reflection, and discussion, and local educational practices shaped by post-Soviet pedagogical traditions, teacher authority, and culturally grounded understandings of moral formation (Amini, 2019; Stephens et al., 2012; Yakavets et al., 2023). Methodologically, the study uses an integrative literature review and desk-based document analysis, organized through four dimensions: moral development, classroom participation, teacher authority and agency, and policy translation during implementation. The paper argues that sustainable value in the digital era is more likely to emerge through culturally responsive hybrid designs rather than direct copying of foreign models. Such designs should preserve local ethical legitimacy while also addressing new demands related to AI ethics, transparency, and digital responsibility in higher education practice (Khurramov et al., 2025; Nazyrova et al., 2025).

KEYWORDS: *Character education, Kazakhstan, higher education, digital era, policy borrowing, Tolyk Adam, teacher agency, AI ethics*

1. INTRODUCTION AND PURPOSE

Higher education institutions are increasingly assessed through academic outcomes together with their capacity to prepare graduates for ethical and socially responsible participation in professional and public life. In many reform settings, this broader mission is linked to questions of integrity, civic-mindedness, and responsible decision-making. The digital era intensifies this challenge because students now develop values in environments shaped by algorithmic media, online communities, and AI-supported learning practices that influence judgment and behaviour beyond the classroom (Nazyrova et al., 2025). Character education can therefore be understood as part of sustainable value creation, since long-term educational impact depends on how graduates use knowledge and technology responsibly.

In Kazakhstan, this discussion takes place within a specific cultural and institutional setting. Post-Soviet pedagogical traditions continue to shape classroom order, expectations of respect, and the role of teachers as moral authorities, even as universities engage with international reform agendas and more student-centred rhetoric (Amini, 2019; Yakavets et al., 2023). At the same time, recent Kazakhstan-focused scholarship suggests that values-based education is increasingly being framed through indigenous moral resources, especially Abai's concept of Tolyk Adam and related efforts to connect national identity, ethical development, and educational practice in the digital age (Makhmetov, 2025; Madiyeva et al., 2025). The purpose of this study is to compare North American character education models with local educational practices in Kazakhstan higher education in order to identify alignment points, tension points, and practical implications for culturally responsive reform.

2. FRAMEWORK AND METHOD

This study uses comparative framework analysis supported by an integrative literature review and desk-based document analysis. The analysis is informed first by scholarship on policy borrowing and translation, which emphasizes that educational models rarely transfer intact from one context to another and are reinterpreted through local meanings, institutional routines, and political priorities (Phillips and Ochs, 2003; Rappleye, 2012). Second, it draws on work about post-Soviet pedagogy, teacher collaboration, and reform implementation in Kazakhstan, which helps explain how classroom authority, teacher learning conditions, and institutional expectations shape the adoption of educational change (Amini, 2019; Ayubayeva, 2018; Yakavets et al., 2023). Third, it uses recent Kazakhstan-centred scholarship on values-based education to clarify the local normative framework, including Tolyk Adam and broader axiological approaches relevant to identity and moral formation (Dauyenov et al., 2022; Makhmetov, 2025; Madiyeva et al., 2025).

For the comparative side, the North American model is defined as character education approaches commonly associated with the United States and Canada, where moral learning is often linked to individual autonomy, reflection, voice, and discussion-based reasoning. Such institutional

cultures tend to privilege self-direction and personal initiative, even though these assumptions may operate unevenly across student groups (Stephens et al., 2012). By contrast, the Kazakhstan model is approached through literature on structured classroom interaction, teacher authority, reform translation, and culturally grounded moral discourse, including perspectives on ethics and moral education in broader Islamic and Central Asian contexts (Halstead, 2007).

The comparison is organized through four shared dimensions: assumptions about moral development, patterns of classroom participation, teacher authority and teacher agency, and the recontextualization of borrowed policy ideas during implementation. The method involves selecting relevant peer-reviewed and policy-oriented sources, coding them according to these dimensions, and synthesizing cross-cluster patterns into points of convergence, divergence, and feasible hybrid design.

3. EXPECTED CONTRIBUTION AND IMPLICATIONS

The analysis is expected to suggest that both orientations value responsible behaviour and social contribution, yet they differ in the mechanisms through which moral learning is expected to develop. North American models often treat autonomy and student voice as central pathways for ethical judgment, whereas local educational practices may place greater emphasis on relational obligations, structured guidance, and the legitimizing role of authority. The comparison highlights contextual differences rather than establishing a hierarchy between models. It suggests that character education travels unevenly across contexts and often requires redesign to remain educationally meaningful.

Classroom participation is likely to be one of the sites of tension. Open dialogue and discussion-based moral reasoning are often presented as desirable in North American education models, yet in contexts shaped by strong authority relations these practices may require more structured formats to be feasible and culturally acceptable (Amini, 2019). Similarly, teacher authority should be understood as more than a constraint. In Kazakhstan higher education, it may also function as a resource for moral guidance, continuity, and legitimacy, especially when reforms ask teachers to mediate new forms of ethical reasoning in digitally saturated environments (Ayubayeva, 2018; Yakavets et al., 2023).

These implications become even more important in the digital era. Recent studies on higher education and AI suggest that universities need stronger attention to ethical use of AI tools, transparency, legal awareness, and digital responsibility if technological innovation is to support rather than undermine educational aims (Khurramov et al., 2025; Nazyrova et al., 2025). For Kazakhstan, this means that character education should preserve culturally grounded values while also translating them into pedagogical responses to plagiarism, algorithmic dependence, privacy, and responsible human-AI interaction. A culturally responsive hybrid model may therefore offer a promising path: it can integrate selected practices of reflection and dialogue from North American traditions while retaining locally legitimate concepts of moral formation, including Tolyk Adam as a framework for holistic ethical development.

4. CONCLUSION

This extended abstract proposes that character education in Kazakhstan higher education is more productively understood through comparison rather than simple adoption. When North American character education models are read alongside local pedagogical traditions and indigenous ethical frameworks, the result is a clearer picture of where reform ideas fit, where they clash, and how they can be productively adapted. Sustainable value in the digital era is more likely to emerge from hybrid approaches that strengthen ethical reasoning, teacher agency, and culturally grounded responsibility at the same time.

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The Warner Brothers Discovery Sale and its Journalistic Representation
An Exploratory Study

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ABSTRACT

The American digital entertainment and news media has been experiencing significant market changes in its global product production, distribution and consumption. These changes are related to processes of globalization, technology developments, and consolidation of business and wealth ownership within a changing deregulated political landscape of the United States (McChesney, 2003). To better understand these phenomena, this study examines the case of the Warner Brothers Discovery sale through its journalistic representation of the bidding war taking place during 2025 between major media interests. Furthermore, as an exploratory study of power relations, political influence and journalistic evaluation, it aims to understand this business sale within the framing of societal issues in the changing global media landscape and the changing political climate of the United States.

The research uses the methodology of a case study and content analysis with critical discourse analysis and framing theory to examine the phenomena. It concludes there is now massive ownership consolidation and power within the media industry by an extremely small number of individuals. They have the power to shape public opinion and use political influence to achieve further consolidation and wealth accumulation. The research indicates that journalistic coverage and the influence of the media in the society operate as hegemony for the economic and political interests of these oligopolistic neoliberal business owners. This takes place without concern for the effects of the media in the greater society and with very little counterbalance to challenge the massive, concentrated power and wealth of this handful of individuals.

KEYWORDS: media, globalization, hegemony, Warner Bros. Discovery, Paramount, Netflix

INTRODUCTION

The American digital entertainment and news media has been experiencing significant market changes in its global product production, distribution and consumption. These changes are related to processes of globalization, technology developments, and consolidation of business and

wealth ownership within a changing deregulated political landscape of the United States (McChesney, 2003). A key factor in these market changes is the expansion of streaming services over the internet and its impact on feature film exhibition and broadcast cable television (Yin, 2023; PlunkettResearch.com, 2026).

To better understand these phenomena, this study examines the case of the Warner Brothers Discovery sale through its journalistic representation of the bidding war taking place between major media interests. Furthermore, as an exploratory study of power relations, political influence and journalistic evaluation, it aims to understand this business sale within the framing of societal issues in the changing global media landscape and the changing political climate of the United States.

In October, 2025, the media conglomerate of Warner Brothers Discovery (WBD) changed its earlier corporate strategy of splitting into two companies based on film and television cable subsidiaries and announced it was for sale. During November a bidding war took place between Paramount Skydance, Netflix, and Comcast. By early December, a sale agreement with Netflix of $82.7 billion for its streaming and studio business, including HBO, was announced by the board of directors of WBD (Barr, 2025). However, as of the middle of February, 2026 the sale deal negotiation was unresolved. In Dec. 2025, Paramount had counter offered shareholders directly with what is described as a hostile takeover. According to Ganti (2025), "A hostile takeover happens when an entity takes control of a company against the wishes of the company's management. It's an acquisition strategy requiring that the entity acquire and control more than 50% of the voting shares issued by the company". The hostile bid was $108 billion for the entire purchase of WBD including its traditional television of cable channels Mullin et al, 2025). The final sale is also subject to US Federal Government regulatory approval.

This study aims to answer the research questions of 1) how does the journalistic coverage of this case represent economic/business, political or societal interests as power relations? 2) how does the journalistic coverage promote a particular evaluation or interpretation of issues related to the sale as a form of societal influence in the broader context of society? The research is qualitative and interpretive. The study's methodology uses a case study analysis with content analysis of news coverage to answer these research questions. It uses critical discourse analysis and framing analysis as frameworks for the content analysis of two articles of the news coverage for Dec. 8, 2025, one from the American press and one from the British press.

LITERATURE REVIEW

McQuail (1994, cited in Marais and Linstrom) asserts that mass media has the greatest potential for societal effects based in part on its power to direct attention, structure reality, persuade beliefs and influence behavior. In 1996, Bagdikian describes the American concentration of media ownership in the hands of a few corporations as a system that "ignores and resists the central needs

of the society…" Rather it serves to make "maximum profits through their closely held control of the coming world cultural and informational systems (p 7)". This profit is generated through the use of the media to promote consumerism, as buying "compulsively" and "unwisely". Winseck (2008) states that the top global media companies are among the largest corporations in the world and that they are media conglomerates "meaning that they operate across many different media markets, including television, film, newspapers, publishing and the Internet, where their websites are now among some of the most visited sites worldwide". These conglomerates are surprisingly "owner-controlled" which means that a few individuals have massive global power through their use of the media.

As McChesney (2001) points out, this media concentration is framed within the ideology of neoliberalism; this ideology "refers to the set of national and international policies that call for business domination of all social affairs with minimal countervailing force." He maintains that governments then serve the corporate interests, "minimizing any activities that might undermine the rule of business and the wealthy". This may also form a dominant world view by a minority elite of business wealth. This dominance is promoted through societal institutions such as media as a cultural narrative and norm of "common sense" to the majority in the society and those oppressed by the system. This process of power domination is conceptualized by Gramsci with the term, hegemony (cited by Groff, 2023). McChesney further argues that social justice and democratic values are at stake in the evolving global media landscape that is controlled by business interests based in the USA. Dixon (cited by McChesney), a media analyst for the investment firm PaineWebber, claims that these conditions are leading to a global media oligopoly. It may then be understood that the purchase deal for WBD is being conducted within this global context produced by American business and corporate interests. It may further be understood that the news coverage and practice of journalism may be shaped by the media and societal context in which it operates.

For this study, journalism articles are considered *texts*. As Fairclough (1995) explains in his publication, *Critical discourse analysis: the critical study of language*, "the analysis of discourse practice involves attention to processes of text production, distribution and consumption." He has developed a Critical Discourse Analysis (CDA) framework that investigates language as social practice, related to the use of power, its imbalances and inequities. It investigates how discourse in texts as journalism represent social actors such as politicians or business figures.

Erving Goffman (1974) was the first to conceptualize 'framing' and 'framing theory'. He explains how individuals make sense of experiences but also how media organizations construct stories to "align with ideological, political or social perspectives" (cited in Zaklama, 2025). Chong and Druckman (2007) explain that "The major premise of framing theory is that an issue can be viewed from a variety of perspectives and be construed as having implications for multiple values or considerations". The concept of framing, such as the selection of the news and how it is presented, is also related to the concept of salience, giving prominence to certain issues and ignoring others, how the news evaluates issues and how the news may influence public opinion

(Djerf-Pierre et al, 2023; Lim. 2010). Chong further points out that frames in communication are significant because they influence audience behavior and attitudes. Gamson (1989) describes a frame as a "central organizing idea for making sense of relevant events, suggesting what is at issue". Reese (2009) explains that they symbolically structure the social world. According to Entman (1993, cited in Marais and Linstrom), framing analysis is used "to explain how the media structure their delivery of news, promoting certain interpretations of events by selecting certain facts."

For this study, the Critical Discourse Analysis and the Framing Analysis will be applied to the two selected news articles to answer the research questions. Although used with both articles, the CDA analysis was selected to specifically answer question one: how does the journalistic coverage of this case represent economic/business, political or societal interests as power relations? The framing analysis was selected and is used to answer question two" how does the journalistic coverage promote a particular evaluation or interpretation of issues related to the sale as a form of societal influence in the broader context of society?

METHODOLOGY

This study is qualitative, interpretive and exploratory research. It uses a business case study methodology combined with content analysis. The case is the Warner Brothers Discovery corporate sale and its journalistic coverage. This is an on-going case of the sale which begins in October of 2025 and is still unresolved by early February, 2026 when this study was conducted. A case study was selected because of the complexity of the news event's elements of players, set of conditions and issues.

As part of the case study, a comparative content analysis of two news articles was conducted with the use and application of two analytical frameworks. The two frameworks are 1) the critical discourse analysis with Fairclough's Three-Dimensional Model, and 2) media framing theory and analysis. They were applied to two journalism articles both published on Dec. 8, 2025 as business news coverage of the impending sale of the Warner Bros. Discovery conglomerate.

Both frameworks were selected to address the study's research questions of 1) how does the journalistic coverage of this case represent economic/business, political or societal interests as power relations; and 2) how does the journalistic coverage promote a particular evaluation or interpretation of issues related to the sale as a form of societal influence in the broader context of society. Fairclough's model has been used in research to examine language, ideology and power relationships in a society. Media framing theory analysis identifies how news stories can shape perceived reality in a society.

The two articles are: 1) *Paramount Makes Hostile Bid for Warner Bros. Discovery* (Mullin et al, 2025), The New York Times (American press) and 2) *Paramount Launches $108.4bn Hostile*

Bid for Warner Bros. Discovery (Barr, 2025), The Guardian (British press). Both articles were in the business section of their newspapers.

The researcher used purposive sampling identifying the texts as information rich, and accessible, in the English language, with a variation of different national contexts as the publication base, that of the USA and the United Kingdom. Though published in different countries, these countries have similar governments of democracy and economic systems of capitalism. The articles are from the *New York Times*, (NYT), USA, and *The Guardian*, UK, 'newspapers of record'. Newspapers of record are considered authoritative, with high standards of objective journalism and with a large global readership. The Guardian's article was sourced by the publication from its journalist based in Washington, D.C., USA.

ANALYSIS/RESULTS AND DISCUSSION

The Case Study and Content Analysis

A) The Case Study

The context for this media business case is the USA business, political and legal environment and its global reach. This is a media de-regulated context with some regulation; the corporate business structure is horizontally integrated and re-integrated vertically (Holt, 2011 p 3). Despite anti-trust laws and court rulings favoring competition over monopoly, what exists in the United States is an oligopoly, a few big businesses dominating its media markets. And those businesses absorb, merge and spin off as needed for the business and profit needs of those companies. This case is about the sale and coverage of Warner Bros. Discovery (WBD). It describes itself as "…a leading global media and entertainment company that creates and distributes the world's most differentiated and complete portfolio of branded content across television, film, streaming and gaming" (ir.wbd.com, n.d.).

The current corporate/conglomerate sell off is related to a changing media and market landscape with its shift to a streaming technology (Jensi et al, 2025). Warner Bros. Discovery, headed by David Zaslav as CEO, had first considered a split into two companies at some point (Chmielewski et al, 2025). The first would have been the Warner Brothers part of the corporation, with film production studios and streaming. The second is what is referred to as Global Networks, but is also called domestic linear television. Linear means that content is released at a specific time to viewers. This designation includes all kinds of TV, broadcast, cable, satellite. And Warner Bros. Discovery owns CNN, TNT as well as Discovery. Audience attendance is down at theatres, being replaced by viewing content via streaming. Consuming media via streaming is also

competing with television, and viewing is down on the more traditional channels, which reduces advertiser spending (Jensi et al, 2025).

Why a sale? What triggered this potential sale? Let's consider our more recent conglomerate business history. The corporate entity and conglomerate, Warner Bros. Discovery was created in 2022. This occurred when the parent company of Warner Bros., AT&T, got rid of its WarnerMedia division, which then merged with Discovery (Maas, 2022). This was a merger of content with streaming resources and apparently produced a massive debt, $34.5 billion, at least that's what is on the books (Spangler, 2025).

The trigger appears to be the release of the company's third Quarterly Report on September 30, 2025. These are required of publicly held companies by the US Security and Exchange Commission of the US government. They report the financial health of the company. This Quarterly reported a $148 million loss with advertising revenue dropping by 16%. Yet the company is making money, its films are making money, its television is making money. It has cash flow, ending the quarter with $4.3 billion of cash on hand. There was also an increase of 2.3 million subscribers to its streaming since the previous quarterly report (James & Masunaga, 2025; Steinberg, 2025). Also, the films *Superman* and *F1* were big hits and profit producing films for Warner Bros. Discovery in 2025. Although there was a decline in advertising, overall, linear television continues to generate revenue. The company's intellectual property ownership includes the *Harry Potter* film series as well as the *Batman* film series.

The most visible potential buyers of Warner Bros. Discovery initially were Paramount Skydance, Comcast, and Netflix. After decades of corporate conglomeration and concentration of wealth by media companies, this is a new level or intensification of re-arranging of parent companies and subsidiaries with the possible combination of streaming platforms and the ownership interests of Silicon Valley.

In addition, these are public corporations; as such, there are the interests of shareholders and corporate ownership involved in the potential sale. If you look at stock ownership of these three potential buyers, publicly-held corporations, they have major institutional ownership by the same institutions, such as Vanguard and Blackrock.

The largest individual stock holder of Netflix, the subscription based streaming service, is its co-founder, Reed Hastings. He serves as Chairman of the Board. Netflix has two Co-CEOs, Ted Sarandos, content strategy, and Greg Peters, business operations (Netflix.com, n.d.). Paramount Skydance has a more complicated ownership but seems to be primarily owned as majority stockholders by the Ellison family, Larry the father and his son David. Larry, the founder of the computer software tech company Oracle, is one of the richest men in the world.

Comcast, with a history of roots in cable television, is a multinational media conglomerate. It also seems to be a 'family' business though publicly traded. Founded in 1963 by Ralph J. Roberts, with other partners, his son Brian L. Roberts is its CEO and chairman of the Board.

These potential buyers represent a concentration of wealth and media power of influence. By Dec. 2025, Comcast had withdrawn its offer and there were only two bidders, Netflix and

Paramount Skydance (Paramount). On Dec. 5, Netflix (about.netflix.com) released on its corporate website the news: "Netflix, Inc. (the Company) and Warner Bros. Discovery, Inc. (WBD) announced they have entered into a definitive agreement under which Netflix will acquire Warner Bros., including its film and television studios, HBO Max and HBO."

As a result of this agreement and the loss of their purchase by bid, Paramount launched a hostile takeover of Warner Bros. Discovery on Dec. 8, 2025.

B) Content Analysis of News Coverage of the Hostile Bid, Dec. 8, 2025

The two representative articles used for the content analysis are the following:

1. *Paramount Makes Hostile Bid for Warner Bros. Discovery* (Mullin et al, 2025)
- The New York Times (NYT), (American press), 1157 words
2. *Paramount Launches $108.4bn Hostile Bid for Warner Bros Discovery* (Barr, 2025)
- The Guardian (G), (British press) 1284 words

The Fairclough's Three-Dimensional Model was applied in a limited analysis over its three areas. It consists of the following: 1) Description of the text (textual analysis of language elements); 2) The interpretation level (discursive practice analysis of text and intertextuality); 3) The explanation level (social analysis and implications)

Fairclough's Three-Dimensional Model Analysis and Findings

a. The description of the text (textual analysis of language elements)

The analysis identified and examined nouns, verbs and modal verbs of necessity or possibility: *may, might, can, cannot, could ,will, would, should, shouldn't, must, have to*.

The two articles had similar word counts, The New York Times (NYT), 1185, The Guardian 1293. However, the different nouns were 55 for The New York Times and 145 for The Guardian. The latter was more diverse and extensive with added details and different players. General content themes that emerge from the nouns and proper nouns were: *business, government/politics, media, groups of social actors,* and *individuals in power relationships*. There were proper nouns of individuals, companies, and government organizations.

Although the nouns of both articles covered the *who* and *what* of the news, there were several areas of substantial difference in the nouns of the two news stories. The New York Times article and its nouns emphasized the group 'shareholders', and the influence and power of shareholders with share values and stock price as stated dollar values. It identified Silicon Valley companies

such as ‘Apple’ and ‘Meta’, indicating the economic power structure of the digital industry. Also, it used the proper noun of Hollywood and nouns from the movie industry, i.e. theatrical release, film studios.

The groups (social actors) identified by The New York Times included ‘creative community’, ‘consumers’, ‘shareholders’, ‘ownership’, ‘tech giants’, ‘authorities’, and ‘rivals’. These groups are related to wealth and value ownership of equity stock and company ownership.

The Guardian identified in its nouns an overlap with The New York Times but also wider range of groups (social actors) of ‘shareholders’, ‘experts’, ‘leaders’, ‘attorneys’. In contrast to the New York Times, there was an inclusion of nouns and pronouns related to politics, i.e. “Republican legislators”. Furthermore, in contrast to The New York Times which identified the group of worker/employees as “creative community”, The Guardian article included more nouns of workers that included the nouns of “employees”, “staffer”, and “entertainment unions” as well as more specific proper nouns in these groups.

The Guardian article used nouns with the process of business in the hostile bid with business words of “offer”, “transaction”, “cash”, and “value” of company versus share price. There were more government nouns and pronouns such as “licenses”, “scrutiny”, “FCC”, “Dept of Justice”. Furthermore, the industry emphasis in the nouns was television and cable channels, with a high selection of nouns about news, in contrast to Hollywood, and Silicon Valley in the New York Times article.

The New York Times and The Guardian equally mentioned Paramount 16 times, Netflix was mentioned more times in the NYT, WBD was mentioned more times in the Guardian. This may indicate a substantially different perspective on the corporate power relationships. In addition, when identifying the proper nouns Sarandos the head of Netflix was mentioned 4 times, more in the New York Times than The Guardian that identified him only by name once. David Ellison of Paramount was mentioned 6 times in The New York Times, however, The Guardian mentioned both father and son by name for a combined 13 times. Zaslav the head of WBD was not mentioned by name in The Guardian article, but was a proper noun, named twice in The New York Times. For both articles Ellison is a representation of individual power within the media and business landscape, especially in contrast to Zaslav, the seller.

With proper nouns for the different areas of media and government/politics, The Guardian had names of news organization heads of CNN and CBS, i.e. Bari Weiss, in addition to the American politicians Kamala Harris and Marjorie Taylor Greene. The one proper noun of a politician that occurs in both articles is that of U.S. President Donald Trump. He is mentioned 6 times in The Guardian article and 2 times in The New York Times. This is an indication of his power relationship with all the parties, especially the Elliots, Kushner and the Middle East investors, the government regulators, and the CBS news head, Weiss. The power to influence or shape the news content by Donald Trump through the relationship he has with the Elliots and Weis in addition to his own social media platform Truth Social is more explicitly presented in The Guardian article and the inclusion of its nouns and proper nouns.

Both publications identified Jared Kushner, Trump's son-in-law and his investment firm Affinity Partners, with the names of the Middle East countries and their funds. These funds are substantial cash backers with Affinity in the Paramount hostile takeover by the Elliots, father and son. This is the one geo-political power relationship in the articles. This is an implied political and possibly governmental influence relationship because of Kushner's relationship with Trump. However, this was not explicitly discussed.

Both articles have strong, aggressive verbs related to a hostile bid. For the NYT these include "argue" "mounted", "alleging", "has wrangled". For The Guardian the verbs were slightly more reserved and moderate but still included "lashed out" and "mocked" as the strongest. In analyzing the modality verbs, The Guardian used "might" once, "could" twice, and "would" eight times. This represents a low modality that softens their statements and possibly appear less responsible for shaping the meaning. In contrast, the NYT article only used "would" as a modality verb. It used it seven times. This represents a low to medium modality of certainty indicating more direct responsibility and authority.

b. The interpretation level: discursive practice analysis of text and context through intertextuality and sources

The interpretation level or discursive practice in journalism addresses how texts are produced in *the situational context*. This context influences and is reflected in intertextuality, how a text uses quotes or other texts to produce meaning. Sources and quotations indicate not only who is given 'voice' but who is omitted as a 'voice' in a society. This is the area of analysis that was selected for this stage of the model because of the richness of evidence in the texts.

In terms of the situational context, it is also useful to ask questions about time and place. (Janks, 1997). However, these two articles align with the same time and both are sourced from the USA, even though The Guardian is published in the United Kingdom. The difference in organizational ownership from a different journalistic history may influence practice. It is identified and described as part of the situational context below but its influence of practice is beyond the scope of the research to identify in any meaningful way.

The situational context for production of the texts

The overall situational context for text production can be identified as the two news organizations with their publications, editorial strategy and goals.

The New York Times

The New York Times is one of the longest running newspapers in the United States. It is owned by The New York Times Company, which is publicly traded with a special stock class. The majority of the stock is owned, controlled by the Ochs-Sulzberger family who are also the publishers. Based in New York City as a city newspaper, it covers domestic, national and international news.

Its agenda for its audience reception has been described as constructing a "rational," "balanced," or "authoritative" perspective on major events to uphold a liberal-democratic ideology and, in international reporting, a Western-centric worldview (Berkowitz, 2013). It has the largest number of readers in the USA at 11.88 million with 11.3 million of the total being online. The Times, according to its company website https://www.nytco.com, explains its target reader as "curious readers and lifelong learners" unified by "independent thinking, civic engagement and interest in other cultures, perspectives and experiences", and having a need for "information they can rely on to help them understand and engage with the world". The Times is portrayed as essential to daily life as a "multi-modal, indispensable 'daily lifestyle bundle'".

The Guardian

The Guardian is based in London as part of The Guardian Media Group. It has a unique independent ownership structure of trusts in which earnings are re-invested in the organization. This is to "stay independent from any outside influence, whether financial, political or commercial" (www.theguardian.com/about).

It describes itself as "delivers fearless, investigative journalism - giving a voice to the powerless and holding power to account. Our independent ownership structure means we are entirely free from political and commercial influence…." The Guardian states its values in the practice of journalism as "honesty, cleanness [integrity], courage, fairness, a sense of duty to the reader and a sense of duty to the community" (Viner, 2017). It has one of the highest global online readerships at 81 million monthly. Its monthly print readership is 3.1 million in 2023 (Vijay, 2023).

Intertextuality and Sources

The New York Times

The article identifies both individuals and companies as sources of information. The individual sources are Sarandos, the head of Netflix, Ellison, the head of Paramount, Gordon, the CFO of Paramount, and Trump, the President of the USA.

A breakdown of intertextuality sources and quotes follows:

1) Two *statements* from WBD are used as source content and one is quoted.
2) An *announcement* from Netflix is used as source content.
3) Paramount and 1) a news release 2) a letter to Netflix Zaslav are sources of content
4) Ellison (Paramount) is a source quoted in a press release
5) Ellison (Paramount) is a source and quoted from his conference call
6) Gordon (Paramount) is a source and quoted from Ellisons conference call
7) Sarandos (Netflix) is quoted as a source from a *media conference*
8) Trump at a Kennedy Center event is a source and quoted.

The two statements from WBD are 1) a response to the hostile takeover and "advising shareholders not to take any immediate action"; 2) an earlier response to a Paramount letter accusing favoritism in which it responds that it fully "complied with its obligation to shareholders".

Zaslav, the head of WBD, is not quoted or identified as a source of information. However, his name occurs in the article 1) as a quote from Ellison in a conference call in which Zaslav was previously informed that an earlier proposal was not its "best and final offer"; and 2) in a letter from Paramount "alleging…the sale process 'favors a single bidder"'. He has no individual voice but only through the voices of others. This may indicate or shape his role and power relationship in this deal as less significant.

Although the sale deal of WBD to Netflix had been agreed upon just prior to the hostile takeover attempt by Paramount, Ellison and Paramount have greater presence as content and quoted sources than Sarandos and Netflix. This may also indicate greater power and establishing credibility of Ellison and Paramount as a relationship with the other social actors.

Trump is quoted as a source to indicate his "unusual" exercise of power in the sale. He could influence the government regulatory process "typically reviewed by independent regulators at a distance from politicians' input".

The Guardian

The article identifies both individuals and companies as sources of information. But there are substantial differences in the sources and their information compared to the NYT article. The Guardian also includes social actor/groups as sources of information but not with quotations. They are "legal experts", "attorneys for Paramount", "analysts", "CBS News employees", "US politicians", "entertainment unions", and "Republican legislators". The individual sources quoted are Sarandos, the head of Netflix, Ellison, the head of Paramount, Thompson, CNN (WBD) CEO, CBS News Staffer, and Trump, the President of the USA.

A breakdown of intertextuality sources and quotes follows:

1) WBD (1) *announcement* from WBD is used as source content and (2) a *statement* is quoted that 'it would carefully review and consider' the bid and advise its shareholders.
2) Thompson (CEO CNN/WBD) is a source quoted in a *statement.*
3) Paramount and 1) a regulatory filing 2) attorneys for Paramount letter to WBD 3) statement
4) News Staffer (CBS/Paramount) is a source and quoted
5) Elliot (Paramount) identified as silence, NOT answering a question from his conference call
6) Sarandos (Netflix), Netflix leaders, is quoted as a source from an industry event.
7) Trump, quoted from his Truth Social platform post.
8) 60 Minutes broadcast (CBS/Paramount) with indirect quote by Greene that legislators mocked Trump.

The Guardian article appears to have more balance of sources in comparison to the New York Times. It also has a much greater range of social actors providing information, content and quotations.

Sarandos and Netflix appear to have equal emphasis in both articles. However, the emphasis on the news media and quotations from news employees in The Guardian article is a strong contrast with The New York Times. The Times mentions CNN as a TV channel with TNT rather than its role as a news channel. Yet, The Guardian content is about job losses with the quotations from news workers.

It does not focus on the individual power relationship of Ellison. However, the focus on an individual power in the media landscape and with media corporate purchases is emphasized more in relation to Trump as political power entwined with economic power.

The article ends with a very long quotation from Trump and has a greater focus on political power as well as the use of intertextuality to shape this power relationship in the sale and its influence on news media. Its use of intertextuality is significant with both the CBS show 60 Minutes and Trump's social media platform, Truth Social. The article ends with a quotation by Trump about 'FAKE REPORTING' and his support for the Ellison's takeover of CBS News. He did not like the 60 Minutes broadcast in which Greene told the CBS correspondent Lesley Stahl that Republican legislators mocked Trump. Although not a direct shaping of societal power relationships as journalism, this could be interpreted as an implied power relationship in the society for limiting free speech and criticism of Trump.

c. Socio-Cultural – Social Analysis - Explanation

This section of the framework is interpretive of the discursive practice within the socio-cultural context. It attempts to examine how societal power systems influence the text. Moreover,

it analyses how the discourse of the text reinforces or challenges existing power structures, ideologies and hegemony of power over the less powerful. It does this by answering in the analysis narrative the following questions:

1. What power relations are enacted, supported, or negotiated in this discourse?
2. What social, political, and historical factors gave rise to this discourse?
3. Who benefits from this discourse, and who is marginalized?
4. Does this discourse reproduce or change the existing social order?

Situational Context (The Immediate Situation)

The setting is the American media business landscape, including the actions taken by major media conglomerates. This situational action of "news of the day" is the sell-off of WBD, the announced purchase by Netflix and the hostile bid offer by Paramount. It also includes the communication by the major media conglomerates of WBD, Paramount and Netflix, their industry and corporate events, and the actions by investors, politicians and government. The situation is business news coverage conducted by the two major news publications of the New York Times and The Guardian.

The discursive event of the news article texts is intended to inform the readership of the news publications about the hostile bid by Paramount and who is going to secure the ownership of WBD.

Institutional Context (The Structure)

The social institution that shapes the text are news media organizations professing to practice objective, fair, balanced and honest coverage of a free and Democratic press. The New York Times is a stock-based family ownership and The Guardian is a trust based, non-profit generating company. It is not clear how the readership is directly influencing the text production.Trust and accuracy for in-depth coverage are stated goals of the New York Times for its digital subscriber-based readership. Independence of coverage is a goal of The Guardian for its readership, which is donation-based and having a "progressive, liberal agenda". It is not dependent on revenue from advertising.

Societal Context (The Broader Society) and Explanation of which power is at play - in answer to the four questions

The neoliberalism of capitalism is normalized and reinforced by both texts. According to Larson (2025) "Neoliberal capitalism is a political-economic ideology focusing on free-market capitalism, deregulation, privatization, and reduced government spending to prioritize corporate power and wealth accumulation." This appears as the dominant ideology of the texts. Emerging as a powerful reframing of the American society from the 1980s onwards, it treats market competition as the core driver of human progress, aiming to minimize state intervention in economic and social welfare (Buch-Hansen and Wigger, 2010). The outcome of government de-regulation and the support of corporate wealth expansion has resulted in concentrated horizontally and vertically integrated business structures including media companies that are not competitive. Rather, they are oligopolistic. Their political influence has emerged as oligarchic. However, this normalization of neoliberalism appears much stronger in The New York Times article in contrast to The Guardian. The emphasis of The New York Times is on the deal making and the share values on the stock market. The stockholders are the important group in addition to the heads of the media conglomerates and the individual, Donald Trump. They appear to be more important than other groups of the society who are invisible to their coverage. In the article, there is a discourse of the vested interests of Netflix and streaming versus the theatre owners and Hollywood related to "creative interests". Yet there is nothing on how creative content of fiction or non-fiction and news influence and shape thinking and behavior of the society's audiences.

There is some minimal mention in The New York Times of impact of the deal on jobs. In contrast, The Guardian has a lengthier discourse about employees and jobs in the news industry. This is a hegemonic shift to include workers as societal players with some type of limited power within the media conglomerate and concentration of ownership and wealth of a small group of individuals. In these articles there is no discussion of the social effects or impact on society of the business structure, the deal offer, nor its possible outcomes that would result in the concentration of more media power and influence in the hands of individuals and possibly foreign governments in the Middle East. They do not address the role and rationale of the regulatory agency and the function of the government; nor do they directly address the special interests of Trump's son-in-law Kushner for possible preferential treatment of investment and in the regulatory process. The Guardian does describe the influence of Donald Trump on the ownership and content of the news and its employees. It also describes Trump's power to have Paramount produce a new *Rush Hour* feature film.

The influence of media and ownership of news is however questioned implicitly with the coverage and the discourse of The Guardian. Far greater power of influence and collusion of Trump with the Ellisons appears as power relationships in The Guardian article. This influence with the Ellisons is related to their reshaping of the premier news organization CBS News, though this is not clearly pointed out.

In the first text content involving CBS, The Guardian includes the words "the first amendment" in its discourse. This alludes in meaning to the American Constitution and the right

of freedom of the press in the American democracy. This occurs in the text beginning with "Shortly before the Ellisons won regulatory approval for their takeover of Paramount, the firm agreed to pay $16m to settle a lawsuit filed by Trump…" The lawsuit was over a pre-election news interview with the Trump opposition candidate Harris. The interview may have been protected by the First Amendment and the payment may have been unnecessary. The implied meaning may be that of an informal bribe payment to Trump to more easily secure the Ellisons' purchase and consolidation. This does however indicate an unstated relationship of the democratic ideology that neoliberalism operates within as non-competitive and oligopolistic.

The discourse serves the interests of the dominant group, the extremely wealthy ownership of the media conglomerates, the investors, and the entwined political and financial power of President Trump. It serves to perpetuate the hegemony of a status quo for extreme concentrated wealth and power. Values of influence, cronyism and favoritism are not challenged in the texts. They report the power as agency and the use of money for value by individuals and conglomerates.

It could be understood that the texts portray the change to autocratic presidential power as hegemonic. Also indicated is a social power struggle of change for oligarchic control among Silicon Valley billionaires. The discourse of the text indicates this control over all the major media is being combined with the use of presidential power in business influence and investment. This identifies an oligarchic shift being normalized as well as individual political power combined with family gain as acceptable societal values. Rather than challenging concentrated power and wealth in the hands of a few individuals, both The Guardian and The New York Times appear to reenforce the hegemonic dominance of an oligopoly of business ownership and an oligarchy politically.

The Media Framing Analysis and Findings

News framing is "The process whereby news media highlight, emphasize and give more prominence a specific aspect of a news story" (Salaudeen, 2023). This results in *salience*, the prominence, visibility or significance given to issues, events or topics that may influence the understanding and beliefs of its readership.

This analysis seeks to identify what has been emphasized and given more prominence in the story of the hostile takeover of WBD by Paramount to the readership of The New York Times and the readership of The Guardian.

The framing analysis aims to answer the research questions, especially #2, 1) how does the journalistic coverage of this case represent economic/business, political or societal interests as power relations? 2) how does the journalistic coverage promote a particular evaluation or interpretation of issues related to the sale as a form of societal influence in the broader context of society?

The framework was applied in a limited analysis of the news article selections over the following seven framing areas:

a. Problem/Issue Framing
b. Causal Interpretation Framing
c. Moral Evaluation Framing
d. Interpretation/Responsibility Framing
e. Who Has the Solution Framing
f. Risks/Dangers or Consequences Framing
g. Treatment and Recommendations Framing

It uses an inductive approach of 1) reading through the articles to search for and discover recurring themes, narrative and elements; 2) reading through a second time for selection of content and 3) interpreting the content; the approach aims to identify how dominant frame (category), its topics, interactions, identities, values, and relationships; who is quoted, the establishment of 'facts', validity or authority and the marginalization of points of view.

a. Problem/Issue Framing: What is selected in presenting a problem, what is presented as more significant or highlighted

NYT: The problem is initially framed with its headline and subhead. The article has a clear and short headline that framed the news as a business hostile bid and the subhead expanded the framing with the bid as an offer to shareholders after Warner Bros. had an agreed sale with Netflix. The framing in the article text establishes a limited problem between media corporations, their owners, board of directors of WBD and the shareholders of WBD.

The hostile takeover bid is also framed as a Hollywood problem or issue, with WBD described as a "Hollywood prize". The problem framing focuses on Paramount and its shareholders offer, including the words "brazen attempt" for the problem of the bid and quotes from Ellison that his bid will make a "stronger Hollywood" as the outcome. There is extensive framing with emphasis on the stock values of the shareholders and expansion of the frame to include the problem of regulatory approval for the Netflix offer if it is accepted. The WBD board advises shareholders not to do anything about the problem yet. Related to the main issue, the framing includes the secondary issue of streaming consolidation and marginalization of theatre release through the use of a quote by Ellison. It also framed the Kushner investment of the takeover as "a wrinkle" in the offer related to the regulatory approval.

G: The Guardian article repeats as framing the same problem as The New York Times. The headline initially frames the problem but also uses specific dollar amount of $108.4bn with more detailed subhead, with the Netflix deal amount of $82.7bn. It identifies what is being paid for 'entire company' versus "studio and streaming operation". The article also frames the problem through quotes from Ellison describing the offer as a better deal because it is all cash and not a mix of cash and stock.

At stake in the framing is a "storied Hollywood movie studio". The framing of the problem, in contrast to the New York Times article, emphasizes traditional broadcast television and the cable news channels. The frame is on news employees, channel merger, and the content shaped by ownership and the influence of Trump. It includes in the frame that politicians have strong reservations but does not expand further.

Although Kushner and the Middle East funds are in the article they are not framed as part of a problem.

b. Causal Interpretation Framing: what are the reasons causing a problem, what is shaping the audience understanding of 'why' this news is happening

NYT: The framing of the cause of the hostile bid is through the presentation of Paramount's accusation, stating that WBD is pursuing an inferior proposal that will have regulatory approval issues. Furthermore, through a frame that is including quotes from a Paramount letter, WBD is accused of favoritism for Netflix. WBD replies that it met its obligations in the earlier competitive bid process. However, its actions are framed as leading to the cause of the hostile bid.

This news is framed in the article as a system of interacting powerful media conglomerates, their individual corporate heads and owners, government regulatory agencies, investors and shareholders.

G: There appears to be very limited framing of cause, quoting Ellison as a way to provide better value to Paramount stockholders. Also, the article appears to frame the cause of the bid as a full purchase all cash tender for the entire company versus the partial purchase by Netflix. However, the framing is similar to The New York Times with the inclusion of a quote from the Paramount lawyers' letter to WBD "suggesting the company was not fairly considering its offer" and that the bidding process had not been fair; thus, leading to the hostile bid.

c. Moral Evaluation Framing: framing the issue as right vs. wrong, care vs harm or fairness

NYT: The New York Times frames as moral evaluation the viewpoint of Paramount and Ellison with the inclusion of a news release content from Paramount. It describes their bid as "a superior offer" because a cable television purchase was not part of the Netflix deal. The article further quotes Ellison from a press release that his bid will produce a "stronger Hollywood" being in the best interests of "the creative community, consumers and the movie theater industry" as care versus harm. The accusation by Paramount of wrong doing by WBD in the earlier bidding and having to go directly to stockholders because of lack of response by WBD is established within this framing. It frames Paramount as being a victim. Netflix is framed as fighting back including with their deal protecting entertainment jobs.

G: The article frames the bid as part of an "aggressive campaign", framing Paramount's arguments as "better value" for shareholders and being able to get through the regulatory process

as an implied moral good. However, the morality of the regulatory process is called into question through framing with the selection of the Ellison's settlement of $16 million to Trump's lawsuit against their news coverage of the presidential election. The use of the word 'revealed' regarding the backing of Kushner frames this as a part of the deal that was not openly presented.

The framing includes the proposed acquisition by Netflix as a "relief" to employees of CNN. They were concerned about a possible Paramount merger of CNN with CBS. Although it is not clearly explained why this is good for the employees, except with the framing including "it will enable us to continue to roll out our strategy to secure a great future for CNN by successfully navigating our digital transition". Paramount's Bari Weiss as the new head of CBS news has undermined balance and fairness in news reporting to create a more one-sided political propagandistic operation that aligns with Paramount's owners and Trump.

This article frames this moral issue of fair reporting by selecting Trump's post on his Truth Social platform. Trump is quoted about the Elliot's ownership paying him the $16 million for "FAKE REPORTING about your favorite President" and accusing them of worse fake reporting. The right or wrong of this fairness issue is left unresolved in the framing.

d. Interpretation/Responsibility Framing: The framing assigns blame, responsibility to individuals, systems.

NYT: The Times article frames the responsibility as one belonging to the media conglomerates with their shareholders. The boards of both Netflix and WBD had approved the Netflix purchase. Furthermore, it is framed as a financial system responsibility especially related to value of stock ownership.

It reports that WBD had responded to the hostile bid "advising shareholders not to take any immediate action" and that it had complied, absolving it from Paramount's accusation of unfairness in earlier bids. The framing also involves the expectation of the regulatory authorities but frames it with the possible individual actions of Trump, as "highly unusual for a president to have a direct say on major corporate deals".

The framing includes statements by Ted Sarandos of Netflix that the company wasn't going to back down and reassured the entertainment industry. This reassurance included Netflix acting responsibly to keep films in theaters rather than only streamed.

The article points out what happens if the deals fail for approvals. As part of the regulatory process, different fees would be paid out for resolving the issue if the deal does not work out. At dispute for resolve this is the theatrical distribution.

There was no framing of a societal solution except for the regulatory agency function. Trump is quoted that he would be "involved" in the regulatory review. Otherwise, responsibility was framed as individual heads of the media conglomerate or the shareholder action. It was framed as the players deciding what they choose to do.

G: The Guardian article frames the cause of the issue to David Ellisons's Paramount Skydance as "not giving up in its aggressive campaign to acquire Warner Bros Discovery (WBD)" to secure ownership of WBD with a hostile bid. This is even after a sale had already been agreed upon between WBD and Netflix. The framing makes clear the bid is for the entire company. Ellison's role of a responsible party is framed with his quotation that he is fighting for "our shareholders and for WBD shareholders". The framing of responsibility of Paramount is to give shareholders better value. Furthermore, the actions of Paramount would survive regulatory scrutiny.

WBD stated that it would "review and consider" and "advise its shareholders on how to respond" framed as a responsible adviser.

Sarandos and Netflix leadership are framed as not concerned and having a done deal that would go through. The framing for their deal structure was presented with coverage that included a conference call between analysts and Ellison. Ellison would not respond to the question of only buying the television group if the Netflix deal was completed. His silence is part of the framing.

The article also identified Trump as "personally involved in the review" framing him as a responsible person in the review process rather than questioning his statement. The article ends with a framing of a Trump quotation from Truth Social, his social media platform. He is framed as an arbiter of what can be shown as content in the news.

e. Who Has the Solution Framing: this framing identifies actors, institutions or groups including authorities that could resolve a problem or those left out or who could not resolve an issue.

NYT: As framed in the article, the WBD Board of Directors states it is not making any changes with the competitive bid and the sale of Netflix. It is advising shareholders not to do anything as their initial solution to the hostile bid in the short run. However, the framing shows stock value increasing 5 percent with the hostile bid. The article then frames the solution as being the assessment of the shareholders combined with regulatory authorities. The complete takeover is backed with Kushner's investment, guaranteeing a cash offer.

Thus, Netflix is not framed as having the stronger solution, but the lesser though they are framed stating they would make jobs. This weaker framing is due to only a partial corporate media purchase. In addition, their purchase of WBD is with a mix of cash and stock, not the full cash amount in the hostile bid.

The framing shows that "The creative community, consumers, and the movie theater industry" are involved and affected but have no power to resolve the issue. The framing offers the Netflix argument that they would pass in the regulatory review against monopoly charges if considered as part of the larger entertainment industry of platforms and tech giants. The article ends by stating that "cozy relationships among moguls" typically resolve an issue like this and the hostile bid is atypical, having not worked in the past when Comcast tried to take over Disney.

G: The Guardian article is framing Ellison and Paramount as "not giving up in its aggressive campaign…" The offer has been sent directly to the shareholders with greater value and a premium. And, WBD is framed that they would advise shareholders what to do within two weeks. Although this is not clearly stated but implied, the framed solution is the action of the shareholders to accept the bid or not.

The article further frames the solution in part with Trump's support of the Ellisons purchase of WBD, including making changes to CNN. It further frames the solution with a quote from Ellison that describes the Netflix deal as inferior, as a mix of cash and stock, with an uncertain trading value of the cable business and a "challenging" regulatory process. Although affected, employees and corporate management of subsidiaries at the networks have no role in the solution. Other politicians such as Warren and labor unions are mentioned as expressing reservations but have no further role of power to do anything as framed in the article.

f. Risks/Dangers or Consequences Framing: This framing identifies negative outcomes, costs or trouble with an issue and shapes perception of urgency.

NYT: The article frames the loss of value of the company, debt and share value as a risk consequence in the framing of the news. There is framing of negative outcomes with the regulatory process for the Netflix purchase, which is argued by selectively framing quotes from a Paramount statement and from Trump at a Kennedy Center event.

In contrast to the hostile bid by Paramount, it frames the Netflix deal as having the risks. To which Sarandos responds at a media conference quoted in the article, "We're not cutting jobs" and to reassure "anxious entertainment industry" about commitment of "keeping Warner Bros. movies in theaters". In this framing they are quoted as "We didn't' buy this company to destroy that value". If the Netflix deal is not approved by regulators, it would owe WBD. If WBD takes another offer than the one by Netflix, it would owe Netflix money. But the article further describes the Netflix deal as "landed like a bomb in Hollywood, setting off fears that the streaming giant would eventually marginalize theatrical releases…" and its commitment to theatrical distribution is viewed by Hollywood as "skeptical".

G: The Guardian article frames Paramount as "not giving up its aggressive campaign" indicating urgency in the competition between the media conglomerates for the purchase. Ellison is quoted calling the Netflix proposal inferior with an "uncertain future trading value of the Global Networks linear cable business and a challenging regulatory approval process".

It shares the Ellison quote that shareholders "were not presented [the] most compelling and superior transaction" because of WBD favoritism of Netflix. Value of shares could be at risk, with the Paramount claim of offering better value.

The article focuses on the relief at CNN after the Netflix offer acceptance and fear of a purchase by Paramount, although it does not identify the consequences directly. Those fears of special interest or political influence shaping the news are more clearly framed with Trump's accusation of the CBS "FAKE REPORTING about your favorite president, ME!"

In framing the risks related to the possible restructuring of companies in the media conglomerate landscape, employees at CBS and CNN had feared job loss if a Paramount purchase takes place. The traditional networks of CNN, Cartoon Network and TLC were to be a separate standalone company. In framing this risk by including a conference call with analysts, Ellison did not answer the question if he were interested in buying only the TV networks if his purchase offers failed. Although there was framing of "strong reservations" by politicians, naming Senator Warren, and entertainment unions, nothing was framed about the exact reservation as risks or consequences.

g. *Treatment and Recommendations Framing: This framing proposes solutions or actions to take to address the issue or problem in the news story. Is anyone left out of the solution?*

NYT: In the article framing, Paramount "mounts" a hostile takeover bid as a "brazen attempt" at a "Hollywood prize snatched away by Netflix". It is presented as an uncommon action "at the top of the media industry" to address the issue. This is a conflict between corporate heads, and in a hostile takeover bid, Paramount has gone around the WBD board directly to the shareholders. However, the WBD board provides a recommendation of action about the issue by advising shareholders not to take immediate action. Furthermore, it states the board is not changing the agreement with Netflix. As framed, the direct solution is with the shareholders, though not directly stated, to take the offer or not. But this is not a complete solution. The full solution is framed as including the action of the regulatory authorities to approve the transaction. As framed, this may now include Trump influence, and the financial backing of Kushner and Middle East investors. Netflix is quoted as "super confident" but there is no framing of why they have this confidence, even though they have board approval of the purchase.

What is left out is the role of other social actors, politicians in Congress within the American legal framework, the role of "concerned citizens" or voters and political action over deregulation and monopoly ownership.

G: The article frames Paramount with an aggressive campaign of the hostile bid to resolve the ownership and purchase of WBD. Its owner David Elliot is presented as making a case to shareholders as a full purchase of WBD, as a better value offer and better at getting through the regulatory process. It quotes a statement from Elliot that his is a "superior all cash offer" and "a quicker path to completion". The treatment is a competition between the individual heads of media conglomerates with no clear final solution in the framing.

Sarandos of Netflix and his Netflix purchase is framed as a done deal and he is super confident it will go through as the end of the issue. The article frames this as a solution that will take place by the mentioned conglomerate owners, the shareholders and the regulators, that include Trump's stated involvement. The Federal Communication Commission would not be involved for a review but Anti-trust concerns would involve a review by the Department of Justice as an action to provide resolution.

Overall, for the seven areas of framing, the framing is narrow, focused on the business deal and offers rather than on a greater societal perspective and frame. The framing highlights a narrow group of individual players, their exercise of financial power and dominance in media business consolidation and ownership. The framing also highlights the power of shareholders as a group in the bid offer as well as the individual political power and influence of Donald Trump in the purchase process.

There is a contrast in framing between the two articles. The NYT frames the business news and hostile bid deal as a Hollywood and Silicon Valley framing. The Guardian frames the news of the hostile bid as important for television channels as corporate and political or persuasive value, especially the news channels of CNN and CBS.

CONCLUSION AND DISCUSSION

The journalistic coverage of this case represents the power relationships of media conglomerates that combine the production, distribution and exhibition of product for different types of entertainment and news media markets. These markets are the traditional movie studio theatrical market, the streaming market, and TV with broadcast and cable channel networks. The focus of the coverage is the hostile bid by Paramount for ownership of Warner Bros Discovery, a high stakes prize in competing media interests.

The coverage identifies individuals exercising power in their ownership and management roles with aggressive power exercised unexpectedly as a hostile bid and attack by David (son) and Larry Ellison (father) of Paramount Skydance. This powerful action is over the wishes of the other most powerful individual, Ted Sarandos, of Netflix. David Zaslav, the CEO of WBD has less power as represented in the stories. The American press focuses more on Ellison, his words and his actions.

A power broker represented in the coverage is Donald Trump, the President of the United States as an influencer of CBS News through the Ellison ownership and a projected possible influence through Ellison ownership of CNN News. This represents an exercise of political, economic, societal and cultural power on the audience. It extends also through the representation of Trump's reported request to "bring back the Rush Hour franchise for a fourth film". The entertainment film franchise is American buddy cop action-comedy films. Furthermore, the coverage of stating his potential personal review of the "transaction" as part of federal government regulation process indicates personal power.

Federal government regulators are a group exercising societal power as represented in the American press by The New York Times but less powerful in the British press as represented by The Guardian. Other key powerful entities revealed in the content analysis and connected to Donald Trump are Jared Kushner and the Affinity Partners with Saudi Arabi and Qatar investment funds.

Investors as shareholders are represented as a major powerful group. They are more prominent in the American press as is the stock market share prices as business coverage in the texts. Limited opposition to this conglomerate media power in American society is represented by mention of US politicians in the British press, but not the American press. Those being Senator Elizabeth Warren, Kamala Harris, and Marjorie Taylor Greene.

A secondary level of groups represented in the stories that would be affected by the exercise of the more powerful individuals are employees, fearing job loss, structural declines, which is in the British press. Rather than "employees", "entertainment jobs", "anxious entertainment industry", "Hollywood" are words representing employee interests viewed as a less powerful group in the American press.

In general, it is individual power of personal wealth and political power of the Ellisons, Sarandos and Trump who appear as most powerful within the society from the news content. The journalistic coverage with its selection, framing and salience promote the importance of aggressive business tactics, the value of personal and political relationships for shaping outcomes, the influence of money over shareholders, the use of money for media power and further corporate wealth consolidation in media markets. In addition, the problem is framed as shareholder value, for stocks, as economic value and stockholder interests in the broader context of society versus a greater societal influence. It is also framed as market share changes for the streaming market as a potential outcome and consequence.

The greater societal influence is addressed in the coverage through concerns and consequences of employees with job loss. In The New York Times article Sarandos is quoted as "We're not cutting jobs. We're making jobs." The greater societal issue of media content and its effects to influence public opinion, behavior and politics is not directly stated. The Guardian article was framed with more content on employee concerns, unions and alternative political views of Warren and Greene.

The Guardian frames a critical societal issue about reporting on Donald Trump and silencing criticism. This is framing of political power and influence in shaping the media content through the ownership relationship. The Guardian has framed a consequence of the ownership issue of reporting on Trump, in which he accuses the ownership of Paramount of "FAKE REPORTING" about him. At the same time the framing identifies the involvement of Trump in the regulatory process as unusual.

Anti-trust concerns imply consequences that are not expanded on within the framing. They are addressed as "pro-consumer", "in the best interests of the creative community, consumers and the movie theater industry" and as a "champion of creative talent and consumer choice" on the part of Paramount. This is a particular, limited evaluation or interpretation of issues related to the sale as a form of societal influence in the broader context of society. The content of the British press expressed some coverage of the societal influence in contrast to none by the American press.

In the journalistic coverage of both articles, the business, political and societal interests are represented as the power relations of a handful of individuals. They have massive media ownership

and wealth that also interact directly for influence with presidential power. The journalistic coverage is hegemonic and does not challenge this status quo. Rather it presents it as the normal course of doing business within the ideological context of neoliberalism in the broader context of society.

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A country-level analysis of the influence of ESG strategies on the performance of banks within the Eurasian Economic Union

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ABSTRACT

This study examines the impact of environmental, social, and governance (hereinafter – ESG) factors on the financial performance of banks within the Eurasian Economic Union (EAEU) over 2012–2021. Drawing on the theory-of-the-firm perspective, ESG commitments are conceptualized as operational interventions requiring resource allocation, which may generate short-term efficiency costs while promoting long-term value creation. The empirical analysis employs the accounting-based bank performance ratios as dependent variable, with three ESG pillar-specific indicators as independent variable, using control variable such as capital adequacy ratio, inflation rate and GDP growth rate to escape empirical biases, all data has been sourced from the World Bank database. Regression models with ESG variables and control factors assess the overall and pillar-specific effects on financial outcomes. Results indicate that ESG adoption strengthens stakeholder relationships, fosters sustainable governance, and supports environmentally and socially responsible financing. At the same time, resource-intensive ESG initiatives may temporarily increase operational costs and normalize profitability across banks, explaining mixed results in prior studies. The findings highlight the strategic significance of ESG integration in banking operations and risk management, demonstrating its role in enhancing institutional legitimacy and long-term financial stability. This research contributes to the literature by providing empirical evidence of the financial and strategic implications of ESG practices in the banking sector, offering insights for regulators, policymakers, and financial institutions seeking to align sustainability initiatives with economic performance.

This investigation aims to analyze the effect of environmental performance, social responsibility and corporate governance – ESG strategy of Eurasian Economic Units (EAEU) on the bank performance during 2012-2021(the recent data). The analysis is based on the World Bank database, and it comprises empirical study with showing comprehensive result.

KEY WORDS: ROA - return on assets, ROE - return on equity, ESG - environmental, social and governance, EAEU countries – Armenia, Belarus, Kyrgyz Republic, Kazakhstan, Russian Federation.

Design/methodology/approach – this study examines ESG indicators for 5 EAEU countries and the main bank performance ratios.

INTRODUCTION

In the global economy, banks play a pivotal role in fostering financial stability and promoting social integration, as they perform essential functions such as capital formation, supporting economic development, and ensuring efficient resource allocation worldwide (Levanti, 2021). In recent years, the environmental, social and governance (hereinafter – ESG) factors have gained increasing importance within the financial sector, being recognized not only as ethical considerations but also as key determinants of financial stability and long-term sustainability. Consequently, ESG considerations are shaping both the financial performance and strategic priorities of banks, as evolving client and investor expectations, growing demand for sustainable products, and intensifying regulatory requirements compel financial institutions to incorporate ESG risks into their operational and risk management frameworks. The integration of ESG factors into banking operations has strategic implications, influencing credit policies, prudential requirements, and risk assessment processes. The increasing prominence of ESG ratings reflects a broader shift toward transparency, accountability, and market discipline as drivers of value creation. Due to the sector's distinctive operational and regulatory characteristics, even minor internal or external changes related to ESG initiatives can necessitate significant adjustments in bank operations, which are subsequently reflected in financial statements. To mitigate the risks associated with such changes, banks employ sophisticated mechanisms such as Asset-Liability Management (ALM) while navigating a complex stakeholder environment that includes regulatory oversight aimed at safeguarding systemic stability.

This study examines the impact of the three ESG pillars (Environmental, Social, and Governance) on the financial performance of banks at the country level within the EAEU over a ten-year period (2012–2021). Two accounting-based performance indicators were selected as dependent variables to ensure a comprehensive assessment, while ESG factors were measured using data sourced from the World Bank and other relevant databases. The study adopts a causal research design, with ESG factors measured with a one-year lag relative to financial performance indicators and employs regression models with control variables to enhance robustness. This approach allows for an evaluation of both the overall and pillar-specific effects of ESG practices on financial outcomes.

By drawing on the theory-of-the-firm perspective (McWilliams & Siegel, 2001), this study conceptualizes ESG commitments as operational interventions that require additional resources or

the reallocation of existing ones. Such commitments may prompt a strategic reassessment of long-term objectives while generating short-term efficiency losses, reflected in balance sheet adjustments and ALM processes. This research contributes to the literature by providing empirical evidence on the relationship between ESG performance and financial outcomes in the banking sector, offering insights for policymakers, regulators, and financial institutions seeking to align sustainability with economic performance.

LITERATURE REVIEW

2.1 ESG concept

The ESG practices have emerged as crucial determinants of performance and sustainability within the banking sector. These practices are significant not only for shareholders but also for a broader set of stakeholders, reflecting the growing recognition of banks' social and economic responsibilities (Chollet & Sandwidi, 2018). Strong social and governance performance helps mitigate financial risk while reinforcing banks' commitment to ethical governance and environmental stewardship. As financial risk decreases, uncertainty diminishes, thereby facilitating greater engagement in corporate social responsibility (CSR) initiatives. Moreover, financial performance shapes long-term strategic decision-making, as banks with high profitability can support ESG initiatives without compromising short-term operational stability. Despite these benefits, the adoption of ESG frameworks entails substantial costs. Establishing governance structures, conducting due diligence, and implementing disclosure policies require significant resource allocation (Nizam, 2019). Nonetheless, such investments are expected to generate long-term advantages, including revenue stability, reduced operational risks, enhanced performance, and value creation (Buallay, 2019a). Empirical studies indicate that firms with higher ESG scores tend to achieve greater profitability, improved corporate valuation, sustainable long-term growth, and higher returns (Galbreath, 2013), (Eccles, 2014), (Gregory, 2014), (Gillan , 2021), (Hartzmark & Sussman, 2019), (Raghunandan & Rajgopal, 2022), (Dimson , 2015), (Lins , 2017), (Becchetti , 2018), (Pedersen , 2021). Nevertheless, higher ESG performance does not always guarantee superior financial outcomes, suggesting that the relationship between ESG engagement and profitability is complex and context dependent. Within the banking sector, ESG adoption promotes stronger stakeholder relationships, cultivates positive workplace environments, advances sustainable governance structures, and facilitates the financing of environmentally and socially responsible projects (El Ghoul, 2011), (Jo & Harjoto, 2012), (El Ghoul, 2017).

At the same time, these initiatives require considerable resource allocation, which can increase operational costs and temporarily reduce efficiency. McWilliams and Siegel (2001) conceptualize CSR - an integral component of ESG - through a supply-and-demand framework, emphasizing that stakeholders differ in their valuation of such activities. The higher fixed and variable costs associated with ESG engagement often normalize profitability across firms, which

may explain the mixed empirical findings regarding ESG and financial performance. Consequently, failure to account for ESG commitments may lead to biased comparisons and the underestimation of efficiency for banks actively investing in ESG initiatives.

Managers frequently pursue ESG strategies to enhance ESG scores or achieve specific institutional objectives rather than focusing solely on shareholder wealth (Renneboog, 2008), (Clementino & Perkins, 2021), (Duque-Grisales & Aguilera-Caracuel, 2021). From the perspective of legitimacy theory, banks are expected to consider broader public interests alongside shareholder priorities. Accordingly, ESG engagement can enhance institutional legitimacy by demonstrating that profitability aligns with stakeholder expectations (Buallay, 2019b), (Forcadell & Aracil, 2017). Nonetheless, CSR initiatives are sometimes contentious due to the substantial costs involved (Shen, 2016). Social responsibility has played a key role in restoring reputational capital following the 2008 financial crisis, with transparent stakeholder engagement and comprehensive CSR disclosure serving as indicators of genuine institutional commitment to sustainability (Buallay, 2020), (Forcadell & Aracil, 2017), (Venturelli, 2018).

The disclosure of CSR activities is closely associated with financial performance, as sustainability reporting emphasizes long-term value creation (Buallay, 2019a). CSR initiatives without adequate disclosure provide limited financial benefit and may not positively influence stakeholders' perceptions (Oyewumi, 2018). Furthermore, CSR disclosure can influence debt placement decisions (Tan, 2020) and is associated with sustained above-industry median gross and operating margins (Cannon , 2020). Empirical evidence from the Ghanaian banking sector highlights CSR as a strategic tool capable of enhancing financial performance (Ofori, 2014). However, the strategic implementation of CSR varies across banks, as positive employee relations tend to improve financial outcomes, whereas community engagement and product responsibility may exert adverse effects (Esteban-Sanchez, 2017).

2.2 ESG and its impact on the bank performance

Various accounting indicators related to profitability, liquidity, and financial stability are widely used to assess the performance of banks, particularly by debtholders (Trpeska, Milic, & Janeska, 2017). In examining the relationship between ESG performance and financial outcomes, studies have considered multiple determinants of bank performance, including size, liquidity, and capital adequacy. Bank size is typically measured using the logarithm of total assets or the number of employees, reflecting its influence on economies of scale within the banking system. Beccalli, Frantz, and Mare (2015) analyzed 103 European listed banks between 2000 and 2011, highlighting that extremely large banks are often "too big to fail" and receive significant attention in studies of scale efficiency. Economies of scale can also reduce the costs associated with ESG disclosure, as larger banks benefit from more efficient governance structures (Nizam, Fadel, Buallay, & Alajmi, 2019).

Large banks are generally subject to closer monitoring and heightened stakeholder pressure, which can positively affect financial performance. Such institutions are often more efficient, have

greater access to resources, and can recruit skilled managers, further enhancing operational effectiveness (Buallay, 2019a), (Buallay, Fadel, Alajmi, & Forcadell, 2020). Additionally, ESG performance has been linked to the effective use of resources, as observed in Islamic banks, where social responsibility practices were associated with improved financial efficiency (Platonova, Boubaker, & Megginson, 2018). Liquidity ratios serve as another determinant of scale economies; higher liquidity reduces risk exposure and enhances operational efficiency (Beccalli, 2015).

Capital strength represents a further critical factor in bank performance. Stricter capital requirements can reduce operational costs, particularly for larger banks, while capital adequacy serves as an indicator of financial health and institutional responsibility (Gonenc & Scholtens, 2019). Following the 2008 financial crisis, European banks managed capital adequacy through loan loss provisions, which significantly impacted asset quality and, consequently, financial performance (Pinto & Picoto, 2018).

Elisa and Guido (2022) investigated the relationship between ESG variables and the Italian bank performance during 2016 to 2020. The results of the study have been shown the positive result between emission reduction and bank profitability ratios, while social factor especially, product responsibility has a negative relationship against to bank performance. Regarding the governance factor, the indicator of management and oversight has a positive impact on the bank profit.

Ownership structure also influences bank performance. Initial distinctions between Developed and Emerging Europe, as used by Reuters, have been refined through more transparent classifications, such as those proposed by Ferri, Mura, and Radic (2015). By reviewing Bankscope data, the authors distinguished between commercial or profit-maximizing banks ("shareholder banks") and cooperative or savings banks ("stakeholder banks"). Their findings indicated that shareholder banks exhibited higher profitability before the financial crisis, whereas stakeholder banks maintained better loan quality both before and after the crisis, highlighting the role of governance models and ownership structures in shaping financial performance.

DATA AND METHODOLOGY

3.1 Introduction

Third chapter contains the collecting of data, identifying the methodology of the study, and the models conducted to analyze the variables.

This empirical study uses an independent, dependent, and control variables to rigorously examine relationships between factors. The independent variable represents the main explanatory factor, while the dependent variable captures the outcome being analyzed. Control variables are included to account for other influences and reduce bias in the results.

Accordingly, the investigation comprises three ESG pillars as an independent variable, which are the environmental pillar (Env), the social pillar (Soc), the governance pillar (Gov) (de Villiers, 2017) and ROA and ROE ratios as the bank profitability ratio for the dependent variables. In addition, capital adequacy ratio (CAP), inflation rate (INF) and GDP growth rate (GDP) are

considered as the control variables (Albertini, 2013), (Buallay,2017), (Buallay, 2021), (Hamdan, 2017), (Chowdhury,2017), (Elisa Menicucci, Guido Paolucci, 2022), (Esteban-Sanchez,2017), (Mayur and Saravanan, 2017), (Nizam, 2019), (Bătae, Oana Marina, Dragomir, Voicu-Dan, Feleagă, Liliana, 2020), (Platonova,2018), (Siueia, 2019), (Szegedi, 2020).

In terms of environmental factor, Env pillar consists of CO2 emissions indicator, while the social (Soc) factor has been taken GINI index, and the governance (Gov) factor identified by government effectiveness estimate (gov_eff).

Moving to the variables, this study collected data from World Bank database:

Table 1 Explanation of variables

Dependent variables	**Description measure**	**Reference**
Bank performance ratios		
Return on assets (ROA)	*Commercial banks' after-tax net income to yearly averaged total assets.*	*Bătae, Oana Marina; Dragomir, Voicu-Dan; Feleagă, Liliana (2020) ; Elisa Menicucci and Guido Paolucci (2023) ; Buallayetal (2020); Esteban-Sanchezetal (2017); Xiao-Na Yina, Jing-Ping Lia, Chi-Wei Sub (2023)*
Return on equity (ROE)	*Commercial banks' after-tax net income to yearly averaged equity.*	*Elisa Menicucci, Guido Paolucci (2022); Bătae, Oana Marina; Dragomir, Voicu-Dan; Feleagă, Liliana (2020); Buallayetal (2020); Esteban-Sanchezetal (2017)*
Independent variables		
Environmental (env_co2)	*Carbon dioxide emissions are those stemming from the burning of fossil fuels and the manufacture of cement. They include carbon dioxide produced during consumption of solid, liquid, and gas fuels and gas flaring.*	
Social (soc_gini)	*Gini index measures the extent to which the distribution of income (or, in some cases, consumption expenditure) among individuals or households within an economy deviates from a perfectly equal distribution. A Lorenz curve plots the cumulative percentages of*	

	total income received against the cumulative number of recipients, starting with the poorest individual or household. The Gini index measures the area between the Lorenz curve and a hypothetical line of absolute equality, expressed as a percentage of the maximum area under the line.	
Governance (gov_effectivness)	*Government Effectiveness captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies. Estimate gives the country's score on the aggregate indicator, in units of a standard normal distribution*	
Control variables		
Bank capital to total assets (%) - (CAP)	*Ratio of bank capital and reserves to total assets. Capital and reserves include funds contributed by owners, retained earnings, general and special reserves, provisions, and valuation adjustments. Capital includes tier 1 capital (paid-up shares and common stock), which is a common feature in all countries' banking systems, and total regulatory capital, which includes several specified types of subordinated debt instruments that need not be repaid if the funds are required to maintain minimum capital levels (these comprise tier 2 and tier 3 capital). Total assets include all nonfinancial and financial assets.*	*Elisa Menicucci, Guido Paolucci (2022); Bătae, Oana Marina; Dragomir, Voicu-Dan; Feleagă, Liliana (2020); Platonova, (2018) ; Siueia, (2019); Szegedi,(2020)*
Inflation rate (INF)	*Inflation as measured by the annual growth rate of the GDP implicit deflator shows the rate of price change in the economy as a whole. The GDP implicit deflator is the ratio of GDP in current local currency to GDP in constant local currency.*	*Elisa Menicucci, Guido Paolucci (2022); Athanasoglou (2008), Molyneux and Thornton (1992), Pasiouras and Kosmidou(2007)*
GDP growth rate (GDP)	*Gross domestic product is the total income earned through the production of goods and services in an economic territory during an accounting period. It can be measured in three different ways: using either the expenditure approach, the income approach, or the production approach. This indicator denotes the percentage change*	*Elisa Menicucci, Guido Paolucci (2022); Bikker and Hu (2002), Demirguc-Kunt and Huizinga (1999), Flamini (2009)*

	over each previous year of the constant price (annual percentage growth rate of GDP per capita)	

3.2 Methodology and model characteristics

Hypothesis: how do ESG pillars contribute to the bank performance ratios?

To analyze the relationship between ESG indicators (Env_co2, Soc_Gini, Gov_effectiveness) and bank performance pillar, the study estimates the following econometric models in accordance with the literature previously reviewed (Buallay,2021), (Chang and Devine, 2019), (Elisa Menicucci, Guido Paolucci, 2022), (Esteban-Sanchez ,2017), (Peni and Vahamaa, 2012), (Shakil ,2019), (Shen, 2016), (Siueia, 2019).

Our model used in the study is below:

$$ROA_i = \beta_0 + \beta_{env\_co2} + \beta_{soc\_gini} + \beta_{gov\_effectiveness} + \beta_{cap} + \beta_{gdp\_growth} + \beta_{inflation} + \varepsilon_i \quad (1),$$

$$ROE_i = \beta_0 + \beta_{env\_co2} + \beta_{soc\_gini} + \beta_{gov\_effectiveness} + \beta_{cap} + \beta_{gdp\_growth} + \beta_{inflation} + \varepsilon_i \quad (2)$$

Panel data modeling techniques are frequently adopted in many banking studies on corporate performance (Buallay, 2019a; Buallay, 2020; Esteban-Sanchez, 2017; Maqbool and Zameer, 2018; Platonova ,2018; Siueia, 2019; Weber, 2017). The use of panel regressions, either fixed or random-effects model, has the advantage of controlling unobserved heterogeneity and analyzing data over a longer period (Issa, 2021). In addition, panel data offer a great number of data points, reducing the collinearity among independent variables and increasing the degrees of self-determination.

Elisa and Guido (2022) used panel regression with fixed effects that the intercept is not a random value because each firm is considerably different from another regarding their base levels for the dependent variable. In contrast, panel regressions with random effects can investigate variations between companies for the same year and within each company over time. To differentiate the two approaches, a null hypothesis assumes that capabilities of fixed-effects approach (FE) and random-effects approach (RE) are the same in Hausman test. The RE is inappropriate when a null hypothesis is rejected, and consequently it is preferable to use FE.

We employed the Ordinary Least Squares (OLS) regression model to examine the relationship between ESG factors and bank performance. The dependent variables ROA_i and ROE_i represent the return on assets and return on equity. The key explanatory variables include the environmental performance (β_{env_co2}), social inequality (β_{soc_gini}), and governance quality ($\beta_{gov\_effectiveness}$). Additionally, the model incorporates control variables such as capital adequacy

(β_{cap}), GDP growth (β_{gdp_growth}), and inflation ($\beta_{inflation}$). The error term (ε_i) captures unobserved factors affecting bank performance.

To ensure the robustness of the empirical results, multicollinearity was tested using the Variance Inflation Factor (VIF), and no serious multicollinearity issues were detected.

3.3 Descriptive analysis

The dataset consists of 50 panel observations from 2012–2021 across 5 countries. The dependent variables, ROA (mean = 1.50) and ROE (mean = 10.68), indicate that banks are, on average, profitable, although ROE shows substantial variability (Std. Dev. = 6.56), suggesting differences in performance across countries and time.

```
. summarize
```

Variable	Obs	Mean	Std. dev.	Min	Max
Years	50	2016.5	2.901442	2012	2021
ID	50	3	1.428571	1	5
CountryName	0				
ROA	50	1.498184	.9179299	-.9986222	4.286074
ROE	50	10.67527	6.55941	-8.579772	30.34554
STMR	16	12.4944	16.57828	-8.528354	51.42348
NPL	40	7.786244	3.561009	3.669222	19.47083
ENV_CO2	45	6.543604	4.498708	1.34988	14.81021
SOC_Gini	49	29.89592	4.196375	24.4	40.9
GOV_goveff~s	50	-.3885742	.3119327	-.9788491	.1056911
CAP	40	13.07969	2.351105	8.536616	18.3
GDPgrowtha~l	50	2.487917	3.508222	-7.2	10.91547
InflationG~l	50	8.894061	10.82973	.2685751	75.24167

Figure 1: The results of descriptive analysis

Among ESG variables, ENV_CO2 (mean = 6.54) and SOC_Gini (mean = 29.90) show moderate dispersion, while governance effectiveness has a negative mean (-0.39), indicating relatively weak institutional quality. Control variables such as CAP (13.08) suggest moderate financial stability, whereas macroeconomic indicators like GDP growth and inflation exhibit significant volatility.

```
. correl ROA ENV_CO2 SOC_Gini GOV_goveffectiveness CAP GDPgrowthannual InflationGDPdeflatorannual
(obs=40)

             |      ROA  ENV_CO2 SOC_Gini GOV_go~s      CAP GDPgro~l Inflat~l
-------------+---------------------------------------------------------------
         ROA |   1.0000
     ENV_CO2 |  -0.1957   1.0000
    SOC_Gini |  -0.2598   0.2410   1.0000
GOV_goveff~s |  -0.1986   0.2632   0.2317   1.0000
         CAP |   0.4389  -0.8605  -0.4101  -0.3378   1.0000
GDPgrowtha~l |   0.1308  -0.1372   0.0969   0.0089   0.3031   1.0000
InflationG~l |   0.1258   0.0598  -0.2693  -0.4462   0.0597  -0.0854   1.0000
```

Figure 2: The results of correlation analysis for ROA model

The correlation matrix using the ROA shows generally low to moderate relationships among the variables, suggesting no serious multicollinearity problem. The strongest correlation is between CAP and ENV_CO2 (-0.8605), indicating a high negative association that should be noted. Other variables show weak correlations, meaning they can be included together in the regression without major concern.

```
. correl ROE ENV_CO2 SOC_Gini GOV_goveffectiveness CAP GDPgrowthannual InflationGDPdeflatorannual
(obs=40)

             |      ROE  ENV_CO2 SOC_Gini GOV_go~s      CAP GDPgro~l Inflat~l
-------------+---------------------------------------------------------------
         ROE |   1.0000
     ENV_CO2 |  -0.0070   1.0000
    SOC_Gini |  -0.1531   0.2410   1.0000
GOV_goveff~s |  -0.0910   0.2632   0.2317   1.0000
         CAP |   0.2391  -0.8605  -0.4101  -0.3378   1.0000
GDPgrowtha~l |   0.1011  -0.1372   0.0969   0.0089   0.3031   1.0000
InflationG~l |   0.0616   0.0598  -0.2693  -0.4462   0.0597  -0.0854   1.0000
```

Figure 3: the results of correlation analysis for ROE model

The correlation matrix provides an initial assessment of the relationships between return on equity (ROE) and the explanatory variables. Overall, the correlations are relatively low to moderate, indicating the absence of severe multicollinearity among the independent variables. In terms of pairwise relationships, ROE exhibits a weak negative correlation with ENV_CO2 (-0.0070), SOC_Gini (-0.1531), and GOV_effectiveness (-0.0910), suggesting that these ESG components have only a minimal linear association with bank profitability. On the other hand, ROE shows a moderate positive correlation with capital (CAP) (0.2391), implying that higher capitalization may be associated with improved financial performance. The correlations between ROE and macroeconomic variables, namely GDP growth (0.1011) and inflation (0.0616), are also

weak, indicating limited direct association. Overall, the correlation analysis indicates that while some relationships exist, they are generally weak, supporting the suitability of the variables for further regression analysis.

3.4 Results of empirical study

The results of OLS regression indicate that the model is statistically significant overall, as evidenced by the F-statistic (Prob > F = 0.0294), suggesting that the independent variables jointly explain variations in bank performance (ROA). The R-squared value of 0.3309 implies that approximately 33% of the variation in ROA is explained by the model, which is acceptable for empirical studies in finance and ESG research.

```
. regress ROA ENV_CO2 SOC_Gini GOV_goveffectiveness CAP GDPgrowthannual InflationGDPdeflatorannual
```

Source	SS	df	MS		
				Number of obs	= 40
				F(6, 33)	= 2.72
Model	10.8452184	6	1.80753641	Prob > F	= 0.0294
Residual	21.925686	33	.664414729	R-squared	= 0.3309
				Adj R-squared	= 0.2093
Total	32.7709045	39	.840279602	Root MSE	= .81512

ROA	Coefficient	Std. err.	t	P>|t|	[95% conf.	interval]
ENV_CO2	.1608932	.0651412	2.47	0.019	.0283624	.2934241
SOC_Gini	.0084095	.0354246	0.24	0.814	-.0636624	.0804814
GOV_goveffectiveness	-.065809	.5246495	-0.13	0.901	-1.133216	1.001598
CAP	.4464373	.1383287	3.23	0.003	.1650054	.7278692
GDPgrowthannual	-.0305164	.0442457	-0.69	0.495	-.1205349	.059502
InflationGDPdeflatorannual	.0002512	.012985	0.02	0.985	-.026167	.0266694
_cons	-5.662568	2.792512	-2.03	0.051	-11.34398	.018841

```
. estat vif
```

Variable	VIF	1/VIF
CAP	6.21	0.161067
ENV_CO2	4.79	0.208925
SOC_Gini	1.49	0.670969
GOV_goveff~s	1.43	0.697670
InflationG~l	1.39	0.719427
GDPgrowtha~l	1.35	0.739919
Mean VIF	2.78	

Figure 4: The results of regression analysis for ROA model

Among the explanatory variables, the environmental indicator (ENV_CO2) shows a positive and statistically significant relationship with ROA ($\beta = 0.1609$, $p < 0.05$). This suggests that improvements in environmental performance are associated with higher bank profitability. Similarly, capital adequacy (CAP) is found to have a strong positive and statistically significant effect on ROA ($\beta = 0.4464$, $p < 0.01$), indicating that well-capitalized banks tend to perform better.

In contrast, the social variable (SOC_Gini) and governance indicator (GOV_effectiveness) are not statistically significant, implying that their impact on bank performance is not supported in this model. Additionally, the macroeconomic control variables, GDP growth and inflation, do not show significant effects on ROA, suggesting that short-term macroeconomic fluctuations may not directly influence bank profitability within the sample.

The diagnostic test for multicollinearity using the Variance Inflation Factor (VIF) indicates no serious multicollinearity issues, as the mean VIF value (2.78) is well below the commonly accepted threshold of 10. Therefore, the estimated coefficients can be considered reliable.

In terms of ROE model, The OLS regression results provide empirical support for the relationship between ESG factors and bank performance. While the overall model exhibits limited explanatory power ($R^2 = 0.22$) and is not statistically significant as a whole, certain individual variables demonstrate meaningful effects. In particular, the environmental indicator (ENV_CO2) and capital adequacy (CAP) are positively and significantly associated with ROE, suggesting that both environmental performance and financial stability contribute to higher profitability. In contrast, social and governance indicators, as well as macroeconomic variables, do not show statistically significant effects, despite their variability observed in the descriptive statistics. This indicates that not all variations in the data translate into explanatory power within the regression framework. Furthermore, multicollinearity diagnostics confirm that the model does not suffer from serious collinearity issues, ensuring the reliability of coefficient estimates.

```
. regress ROE ENV_CO2 SOC_Gini GOV_goveffectiveness CAP GDPgrowthannual InflationGDPdeflatorannual

      Source |       SS           df       MS      Number of obs   =        40
-------------+----------------------------------   F(6, 33)        =      1.55
       Model |  335.063349         6  55.8438915   Prob > F        =    0.1924
    Residual |  1187.32492        33  35.9795432   R-squared       =    0.2201
-------------+----------------------------------   Adj R-squared   =    0.0783
       Total |  1522.38827        39  39.0355968   Root MSE        =    5.9983

------------------------------------------------------------------------------
                         ROE | Coefficient  Std. err.      t    P>|t|     [95% conf. interval]
-----------------------------+------------------------------------------------
                     ENV_CO2 |   1.230934   .4793627     2.57   0.015     .2556633    2.206205
                  SOC_Gini |   .0910145   .2606832     0.35   0.729    -.4393495    .6213786
       GOV_goveffectiveness |   .0180864   3.860801     0.00   0.996    -7.836773    7.872945
                         CAP |   2.775548   1.017936     2.73   0.010     .7045412    4.846554
               GDPgrowthannual |  -.1949618   .3255958    -0.60   0.553    -.8573914    .4674678
InflationGDPdeflatorannual |  -.0229277   .0955542    -0.24   0.812    -.2173342    .1714788
                       _cons |  -36.13204    20.5496    -1.76   0.088    -77.94051    5.676429
------------------------------------------------------------------------------

. estat vif

    Variable |       VIF       1/VIF
-------------+----------------------
         CAP |      6.21    0.161067
     ENV_CO2 |      4.79    0.208925
    SOC_Gini |      1.49    0.670969
GOV_goveff~s |      1.43    0.697670
InflationG~l |      1.39    0.719427
GDPgrowtha~l |      1.35    0.739919
-------------+----------------------
    Mean VIF |      2.78
```

Figure 5: The results of regression analysis for ROE model

The multicollinearity test shows acceptable levels, with a mean VIF of 2.78, indicating no serious multicollinearity issues. Although CAP (VIF = 6.21) and ENV_CO2 (VIF = 4.79) are relatively higher, they remain below the critical threshold of 10, confirming that the model estimates are reliable. Overall, the results suggest that only selected ESG and financial factors, particularly environmental performance and capital, play a meaningful role in explaining ROE.

To sum up, following results:

$$ROA_i = \beta_0 + \beta_{env\_co2} + \beta_{soc\_gini} + \beta_{gov\_effectiveness} + \beta_{cap} + \beta_{gdp\_growth} + \beta_{inflation} + \varepsilon_i \quad (1)$$

```
. xi: regress ROA ENV_CO2 SOC_Gini GOV_goveffectiveness CAP GDPgrowthannual InflationGDPdeflatorannual

      Source |       SS           df       MS      Number of obs   =        40
-------------+----------------------------------   F(6, 33)        =      2.72
       Model |  10.8452184         6  1.80753641   Prob > F        =    0.0294
    Residual |   21.925686        33  .664414729   R-squared       =    0.3309
-------------+----------------------------------   Adj R-squared   =    0.2093
       Total |  32.7709045        39  .840279602   Root MSE        =    .81512

------------------------------------------------------------------------------
         ROA | Coefficient  Std. err.      t    P>|t|     [95% conf. interval]
-------------+----------------------------------------------------------------
      ENV_CO2 |   .1608932   .0651412     2.47   0.019     .0283624    .2934241
    SOC_Gini |   .0084095   .0354246     0.24   0.814    -.0636624    .0804814
GOV_goveffectiveness |   -.065809   .5246495    -0.13   0.901    -1.133216    1.001598
         CAP |   .4464373   .1383287     3.23   0.003     .1650054    .7278692
GDPgrowthannual |  -.0305164   .0442457    -0.69   0.495    -.1205349     .059502
InflationGDPdeflatorannual |   .0002512    .012985     0.02   0.985     -.026167    .0266694
       _cons |  -5.662568   2.792512    -2.03   0.051    -11.34398     .018841
------------------------------------------------------------------------------
```

Figure 6: The results of OLS regression for ROA model

$$ROE_i = \beta_0 + \beta_{env\_co2} + \beta_{soc\_gini} + \beta_{gov\_effectiveness} + \beta_{cap} + \beta_{gdp\_growth} + \beta_{inflation} + \varepsilon_i \quad (2)$$

```
. xi: regress ROE ENV_CO2 SOC_Gini GOV_goveffectiveness CAP GDPgrowthannual InflationGDPdeflatorannual

      Source |       SS           df       MS      Number of obs   =        40
-------------+----------------------------------   F(6, 33)        =      1.55
       Model |  335.063349         6  55.8438915   Prob > F        =    0.1924
    Residual |  1187.32492        33  35.9795432   R-squared       =    0.2201
-------------+----------------------------------   Adj R-squared   =    0.0783
       Total |  1522.38827        39  39.0355968   Root MSE        =    5.9983

------------------------------------------------------------------------------
         ROE | Coefficient  Std. err.      t    P>|t|     [95% conf. interval]
-------------+----------------------------------------------------------------
      ENV_CO2 |   1.230934   .4793627     2.57   0.015     .2556633    2.206205
    SOC_Gini |   .0910145   .2606832     0.35   0.729    -.4393495    .6213786
GOV_goveffectiveness |   .0180864   3.860801     0.00   0.996    -7.836773    7.872945
         CAP |   2.775548   1.017936     2.73   0.010     .7045412    4.846554
GDPgrowthannual |  -.1949618   .3255958    -0.60   0.553    -.8573914    .4674678
InflationGDPdeflatorannual |  -.0229277   .0955542    -0.24   0.812    -.2173342    .1714788
       _cons |  -36.13204    20.5496    -1.76   0.088    -77.94051    5.676429
------------------------------------------------------------------------------
```

Figure 7: The results of OLS regression for ROE model

The empirical findings provide moderate support for the relationship between ESG factors and bank financial performance, with notable variation across model specifications**.**

In the ROA regression, the model is statistically significant at the 5% level (Prob > F = 0.0294), indicating that the explanatory variables jointly influence bank profitability. The coefficient of determination (R^2 = 0.3309) suggests a moderate explanatory power, with approximately 33% of the variation in ROA explained by the model. At the individual level, environmental performance (ENV_CO2) and capital (CAP) exhibit positive and statistically significant coefficients, implying that improvements in environmental practices and higher capitalization are associated with enhanced bank profitability. Conversely, social inequality (SOC_Gini), government effectiveness (GOV), GDP growth, and inflation do not demonstrate statistical significance, suggesting a limited role in explaining ROA within this framework.

In contrast, the ROE regression model is not statistically significant overall (Prob > F = 0.1924), and its explanatory power remains relatively weak (R^2 = 0.2201). Despite this, the coefficients for ENV_CO2 and CAP remain positive and statistically significant, reinforcing the robustness of their relationship with bank performance across different profitability measures. The remaining variables again fail to reach statistical significance.

Overall, these results indicate that the impact of ESG factors on bank performance is heterogeneous, with the environmental dimension emerging as the most influential component. The lack of significance for social and governance indicators suggests that their effects may be indirect, lagged, or context-dependent. Therefore, while ESG considerations do contribute to financial performance, their influence appears to be partial and driven primarily by environmental and financial (capital) factors rather than a comprehensive ESG effect.

CONCLUSION

The empirical results indicate that ESG factors and control variables have a stronger and more consistent impact on ROE than on ROA, suggesting that bank profitability measured in terms of equity returns is more sensitive to explanatory variables than asset-based performance.

Specifically, the findings show that environmental performance (ENV_CO2) and capital adequacy (CAP) positively influence bank performance, with their effects being more pronounced and statistically significant in the ROE model. This implies that improvements in environmental practices and stronger capitalization enhance shareholder returns more directly than overall asset efficiency.

In contrast, ROA appears less responsive to ESG and macroeconomic variables, indicating that operational efficiency is influenced by a broader set of internal factors not fully captured in the model. Additionally, social and governance indicators do not show significant effects in either model, suggesting a limited direct impact on short-term financial performance within the sample.

Overall, the results highlight that ROE is a more sensitive and informative measure when examining the relationship between ESG factors and bank performance, while ROA provides a more stable but less responsive indicator.

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Human Capital Inequality and the Gender Wage Gap: Ten Determinants of Labor Market Disparities

Irina Kovaleva[23]

Abstract

Gender wage inequality remains one of the most persistent manifestations of labour market disparities worldwide. While human capital differences are frequently cited as the primary explanation, growing evidence suggests that wage gaps emerge from a broader interaction between individual endowments, labour market structures, and institutional constraints. This systematic literature review (SLR) examines the determinants of the gender wage gap from a human capital inequality perspective.The study identifies 1,267 publications across Scopus, Web of Science, and Google Scholar, from which 63 peer-reviewed articles were selected following a rigorous multi-stage screening process. Based on this synthesis, ten key determinants of the gender wage gap are classified into three analytical clusters: Human capital endowments, structural labour market mechanisms, institutional and cultural determinants. The findings demonstrate that gender wage inequality cannot be explained solely by observable productivity-related characteristics. Instead, wage disparities arise from the processes governing the formation, allocation, and pricing of human capital within labour market institutions. Institutional and structural factors significantly influence both the utilization of human capital and the returns paid for it. By integrating fragmented strands of literature into a coherent classification framework, this study provides a conceptual foundation for subsequent empirical modelling and evidence-based policy design aimed at reducing labour market inequality.

Key words: gender wage gap; wage discrimination; occupational segregation; human capital; wage determinants

Introduction

Inequality in human capital is a major channel of labor market disparities between countries and within countries over time. The disparities in education, skills, work experience, occupations, and institutional barriers that individuals face affect not only the time profile of individual incomes but also the distribution of income. The gender wage gap is another manifestation of inequality in which men are paid more than women for comparable work, and the common explanation for the wage gap is that women have less human capital than men. However, recent research suggests that wage inequality can arise from more fundamental structural, cultural, and institutional factors that affect the endowment, allocation, and pricing of human capital (Kovaleva & Taylor, 2023a, 2023b; Kovaleva et al., 2025a, 2025b).

The gender wage gap is one of the most widely used indicators of labour market discrimination. However, the focus solely on the wage gap may obscure the processes that generate

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and perpetuate the disparities in human capital endowments. Human capital refers to the skills that constitute the endowment of workers. Recent empirical evidence from Kazakhstan and Kyrgyzstan demonstrates that patrilocal household structures and entrenched gender norms intensify female labor effort while simultaneously constraining career advancement and wage equality (Kovaleva, Kudebayeva, & Pech, 2025). So that, human capital not limited to formal education and work experience but also includes constraints arising from household structures and gender norms that shape labor allocation decisions (Kovaleva & Taylor, 2023a). Rather, it is shaped by a range of factors including household composition, gender stereotypes, household decision-making structures, occupational segregation, informality and the broader institutional context. In this way, the endowment and productivity of human capital are shaped by the processes that form the endowment itself, as well as by the prices (returns) that workers earn for their human capital endowment.

Current review make use of recently available data on household structures and gender norms in Central Asia collected by Kovaleva, Taylor, Pech, and Madumarov (2025), which shed new light on how women allocate and utilize their human capital within patrilocal and extended household systems. Evidence from Central Asia indicates that different types of household structures and gender norms significantly affect women's time use in rural Kyrgyzstan. Empirical findings indicate that women living in patrilocally married extended households spend more time on domestic work, which has carry over effects on their labour market participation and potentially also on their inventive activity. Study also examine cultural and power-related factors affecting women's labor market outcomes and find that they are important for women's participation in the labour market and for the gender wage gap. This suggests that the gender wage gap is not driven solely by human capital and other measurable characteristics and that it is important to consider the broader social and institutional context in which wage discrimination occurs.

Also supporting the TOWD, the paper by Kovaleva and Taylor (2023a) applies the Theory of Households' Work Division to the impact of gender norms, gender inequality in the household and gender cultural bias on economic prices and their effects on work division within the household. In the paper referred to above, the authors empirically test the patrilocality hypothesis and present convincing evidence that, on average, women that live with their parents-in-law spend more time on market and non-market activities and their time allocations are different from those of women who do not live with their parents-in-law. Work and human capital choices today affect the potential workforce and skills of tomorrow. Evidence from Kazakhstan and Kyrgyzstan suggests that institutional constraints, rather than purely individual fertility decisions, play a decisive role in shaping female income trajectories (Kovaleva et al., 2025).

The purpose of this review is to examine labor market segmentation and human capital inequality in the context of COVID-19 pandemic. The concept of human capital inequality is traditionally focused on the household level. However, it is essential to extend this scope to labor market segmentation in the formal and informal sectors of employment. Based on recent research on labor market segmentation in Kazakhstan, it was found that wage gap between formal and

informal self-employed workers has greatly increased during the COVID-19 period and the increase in wage gap has a large unexplained component (Musayir et al., 2026). Informality is closely related to the protection and valuation of human capital and therefore may lead to structural wage gaps.

Recent bibliometric evidence further shows that artificial intelligence and digital automation are increasingly reshaping labor reallocation patterns, affecting skill demand, job displacement, and workforce transformation, with gendered implications for access to emerging occupations (Samatova et al., 2025).

A host of factors influence decisions about fertility and demographics including the labor market. Prior research by Kovaleva, Taylor, Korosteleva, and Kudebayeva (2025) demonstrates that an increase in abortion rates in Kazakhstan and Kyrgyzstan was associated with lower female relative income which suggests that rather than the reproductive choice of women being the causal factor in determining the economic outcomes, the extent of the institutional constraint on women in the labor market is a more important determinant. If lower relative income relative to men results from discrimination in the labor market and other market failures this confirms that the wage gap is a market failure issue and not one of the choices and behavior of women.

Recent empirical evidence suggests numerous potential channels through which human capital inequality may emerge. However, the current literature is highly fragmented. A number of studies have individually identified numerous channels, such as education, occupational segregation, discrimination, informality, and culture.

Despite a plethora of research on gender wage gap and labour market disparities, few studies investigated the determinants of labour market disparities underlying human capital inequality that lead to the gender wage gap. Therefore, this study contributes to the literature through a systematic literature review that identifies and classifies the key determinants of labor market disparities underlying human capital inequality. A total of 63 peer-reviewed studies were selected from an initial sample of 1,267 articles indexed in Scopus, Web of Science, and Google Scholar. This study reviewed the literature and identified and classified ten key determinants of labour market disparities underlying human capital inequality that lead to the gender wage gap, and proposed a framework of three categories.

- Human capital endowments (education, skills, labor market experience)
- Structural labor market mechanisms (occupational segregation, monopsony power, competition, informality)
- Institutional and cultural determinants (gender norms, leadership representation, household structure, discrimination)

Combining all the mentioned perspectives, the paper concludes that the gender wage gap is more than just a wage level phenomenon. Rather, it is a consequence of the way human capital is produced, allocated and traded in labour markets. The original findings of this study are most relevant to the field of work and family, and may provide a basis for further research into the determinants of labour market disparities.

Current study contribute to the literature in three ways. First, review provide a formal classification scheme that connects small events that occur at the household level to larger labor market institutions. Second, author interpret gender wage disparities as reflecting gender-based human capital disparities. Third, our paper offers a tool for studying the underlying structures of labor market discrimination and can therefore be viewed as a precursor to empirical studies and policy recommendations.

Methodology

This systematic literature review (SLR) adopts a structured approach to analysing existing research on the gender wage gap. The study commenced with a comprehensive search using Google Scholar, which yielded 1267 articles based on the following keywords: gender wage gap, gender wage inequality, gender pay gap, wage inequality by gender, gender earnings differentials, gender wage disparity, and pay inequality between men and women (Table 1).

To ensure relevance and recency, the abstracts of all retrieved articles were reviewed, and 217 of the most recent and thematically relevant studies were selected for further examination. Following a detailed evaluation of methodology, scope, and findings, a final set of 63 articles was included in this review (Table 1).

	Stages	Reference status	Number of references
1.	**Identification**	Initial entire references	1267
		Duplicates	-217
		Unrelated references	-578
		Number of references after cleaning	472
2.	**Screening**	References that did not fit the requirements for inclusion	-255
		Number of eligibility references	217
3.	**Eligibility**	References excluded based on critical evaluation	-154
		Final sample	**63**

Source: Authors' estimations based on SLR analysis

Table 1. Data selection process

The citations for each selected article were systematically organised in a dedicated database, categorised by thematic relevance, and grouped according to key determinants of the gender wage gap. This classification facilitated a structured synthesis of the findings, ensuring that theoretical perspectives on the determinants of the wage gap were effectively captured.

To guarantee transparency and replicability, the SLR was carried out in three phases: planning, literature search, and reporting.

It has been carried out systematically in several stages (Table 1):

1. The first stage was the **planning stage,** which involved a scoping database search using Scopus, Web of Science, and Google Scholar. Key search terms were identified, relevant sources were selected, and inclusion and exclusion criteria were defined.
2. The literature search stage involved screening and selecting studies based on titles and abstracts that met the inclusion criteria, resulting in a list of potential studies.
3. Then, a **critical appraisal** is conducted to assess these studies against the research questions, and the selection is further restricted to the final list of studies for synthesis.

Furthermore, **network analysis** was applied to identify co-occurrence patterns and relationships between studies, ensuring that all areas of the literature on the gender wage gap are systematically covered. By employing this rigorous selection process, this review offers a comprehensive and up-to-date synthesis of the key determinants of gender wage disparities while maintaining objectivity, methodological consistency, and thematic coherence in analysing the literature.

Findings

1. Education: a pathway to equality or a reinforcer of wage disparities?

Research around the world constantly observes the value of education. Current SLR review suggests that it is a widely held belief that equality between gender roles and social classes can be achieved through education. Bibliometric evidence on gender gaps in school education further confirms that structural inequalities in girls' access to primary and lower-secondary education persist globally, with underrepresentation of research from the Global South, indicating early-stage human capital disparities that later translate into labor market inequality (Temirtayeva, Kovaleva, & Kudebayeva, 2025). Additionally, a higher level of education can lead to higher earnings as it qualifies workers for more lucrative positions. However, for example, according to Beaubrun & Kachouie (2017), cultural norms tend to favor men in the social order in the majority of countries. This statement is remarkably accurate for underdeveloped or developing countries. Navarro-Gómez and Rueda-Narváez (2014) also found that discrimination is not uniformly experienced by female workers, with more significant effects observed among those with higher education levels and better wages.

Beaubrun & Kachouie (2017) also found that education has a significant role in determining wage and has a favorable impact on it. For example, in the Bahamas, authors observed that wages rise by $409 from one educational level to the next on average, indicating that higher education levels are associated with higher salaries (Beaubrun & Kachouie, 2017). However, a study from Cameroon obtained the exact opposite results. Female wage workers have a clear education-based advantage over their male colleagues and enjoy a salary premium (Wirba et al., 2021).

Spanish researchers de la Rica et al. (2021) note that, on the one hand, they observe a more significant unexplained gap at the top of the distribution than at the bottom for the group with a college education. However, on the other hand, the disparity is even greater for the group with less education at the bottom of the distribution than at the top. Authors refer to this unusual trend as

"glass floors" and argue that it stems from statistical discrimination on the part of employers, as fewer women are represented in this group in Spain (de la Rica et al., 2021). The authors agree that there is an educational mismatch which influences gender wages in Spain. They find that the portion of the gender wage gap that results from disparities in returns is more significant in this group, even though it is smaller for those with lower levels of education. Conversely, among highly educated workers, the gender gap is more noticeable. Nevertheless, in this instance, the majority of the salary differences are ascribed to variations in productive traits. In any event, the findings imply that workers who display an educational mismatch are more likely to experience gender wage discrimination (del Mar Salinas-Jiménez et al., 2013). In addition, Garcia-Prieto and Gómez-Costilla (2017) noted that discrimination at all educational levels was prevalent in the Spanish labor market. However, when low-educated workers are examined, this issue becomes quantitatively more significant, and highly educated women experience less gender discrimination (Garcia-Prieto and Gómez-Costilla, 2017).

According to Castagnetti et al. (2018), since women's unobservable traits drive female employment towards overeducation and lower women's salaries more than men's unobservable features do for men, estimates suggest that the gender pay gap is much more significant among workers with more education than among workers with a regular education. The authors conclude that individuals (both men and women) who compensate for their less productive attributes with more education are, first and foremost, best matched by overeducation. Second, it might serve as a signaling tool for women who have invested in a degree that is not useful for their work, allowing employers to recognise their valued but often invisible productive traits and combat salary discrimination based on gender. Since women are underrepresented in higher education compared to men, despite being more educated, there should be no reason to worry that increasing access to higher education will harm women (Castagnetti et al, 2018).

Del Mar Salinas- Jiménez et al. (2013) argue that even though there is less of a gender income difference for people who have low educational attainment, the portion of the gap caused by variations in returns is more significant in this group. Contrarily, the gender pay gap is wider among workers with advanced degrees, although in this case, the main reasons for compensation gaps are variations in workers' productive traits. In any case, findings imply that wage discrimination against women is more prevalent among workers with educational mismatch (Del Mar Salinas- Jiménez et al., 2013).

Another researcher, Park (2018), tried to examine the gender pay gap among doctorate holders in Korea. He discovered that even among highly educated individuals with doctorates, there is a significant gender pay disparity.

Moreover, this discrimination against female PhD holders in the Korean labor market cannot be explained by disparities in gender characteristics (Park, 2018). Additionally, Waite (2016) examined the value of postgraduate education for men and women, finding significant income premiums for both groups, particularly among younger cohorts who held master's and doctoral degrees. However, women with master's degrees had a smaller gender wage gap than women with

bachelor's and doctoral degrees (Waite, 2016). Evidence from transition economies further suggests that even high educational attainment does not guarantee equal labor market returns when household norms and institutional barriers constrain the utilization of human capital (Kovaleva et al., 2025a, 2025b).

2. Marital Status: The hidden factor behind gender pay inequality

According to a well-known economics theory, the reason for the gender wage difference is not discrimination against women by employers, but rather fathers and mothers invest differently in paid employment and the home. The authors of the current SLR observe that marital status is claimed to play a key role in gender pay disparity and the cause of the female wage penalty.

According to the conventional family division of labor, men are responsible for providing for the family's needs while women serve as caregivers. Empirical evidence from Kyrgyzstan supports this mechanism: women living in patrilocal households allocate significantly more time to unpaid domestic labor, which affects their labor market participation and long-term human capital accumulation (Kovaleva & Taylor, 2023b; Kovaleva et al., 2025a). For example, in Italy, cultural factors and low availability of formal childcare services define gender roles that are generally based on the male breadwinner model, in which childcare is almost entirely entrusted to women (Cutillo & Centra, 2017). Other researchers disagree with this statement. For example, according to Purwanto (2021), married females are more likely to serve as both the family's primary provider and caretaker than married males. According to that notion of two roles, working women earn the highest wages, and the marriage wage penalty is no longer in effect (Purwanto, 2021).

Xiu & Gunderson (2013) also studied this issue and found that women's incomes are significantly impacted by childcare duties for children under the age of six. However, if an older family member is present, they are nearly entirely offset, highlighting the fact that women bear a disproportionate amount of the childcare burden. Furthermore, in China, marriage significantly raises women's incomes but not men's, while these effects are almost entirely offset if an elder family member is present (Xiu & Gunderson, 2013).

One more interesting and unusual research was made by Waite (2016), who explored if sexual orientation is a factor in the stratification of labor markets. According to Waite (2016), lesbians, homosexual males, and straight women make the least money, followed by heterosexual men. To put it another way, all males perform better than all women, but lesbians and homosexual men are better off than their heterosexual counterparts (Waite, 2016).

3. The motherhood penalty: balancing career and family at a cost

Women's job market prospects typically decline when they become mothers. According to numerous research studies, mothers have less success in the labor market than women without children. The maternity wage penalty, which is arguably the most well-established and distinct from any gender wage penalty. At least a dozen affluent nations have documented the maternal wage penalty. Additionally, the punishment has not decreased over time.

For example, according to Benard et al. (2008), at least a dozen developed countries have reported this. Additionally, the punishment has not decreased over time (Benard et al., 2008). Misra & Strader (2013) also agree that mothers' wages are significantly lower than those of fathers in many nations, even though women's wages are catching up to those of childless males. Mothers are penalized compared to childless women, whereas fathers receive advantages compared to males (Misra & Strader, 2013).

Kizilova & Mosakova (2019) article examines the dynamics of birth rates in the BRICS nations about gender disparity in the workplace. The authors demonstrate how fertility is impacted by gender inequality in the workplace. The BRICS countries demonstrate that higher levels of women's employment, earnings, and gender equality in the economy are correlated with lower birthrates, as well as a higher proportion of women enrolling in higher education. On the one hand, greater gender parity in the job market makes it simpler for women to balance work and family obligations, leading to more children being born into each family. On the other hand, having several children is becoming less common. Therefore, in the long run, the gender equality policy results in a reduction in the number of children per family (Kizilova & Mosakova, 2019).

According to Benard et al. (2008), compared to other workers, women receive about 5% less money per child. Even after statistically adjusting for a variety of other occupational and human capital factors, including race, education, work experience, and whether a person works full-time or part-time, the penalty still exists. Combet & Oesch (2019) support previous findings and also claim that there is a 3–6% unexplained gender wage disparity favoring men in the United States. According to this research, even before they have children, young women make less money than young males who possess the same productive qualities. This means that young women only make half as much as young men do annually in terms of earnings (Combet & Oesch, 2019).

Looze (2015) states that although prior research has revealed that disparities between mothers and women without children in terms of human capital development, employment experience, job hours, and unobserved factors can contribute significantly to this penalty, they do not provide a complete explanation.

The penalty's component that is still unaccounted for is frequently blamed on a combination of mothers' reduced work effort and prejudice against women by employers (Looze, 2015). The researcher also discovered that becoming a mother lowers the probability of women making the kinds of deliberate, non-family work moves that often lead to higher incomes. Additionally, Looze (2015) found that various patterns of job switching and leaving the workforce account for approximately 20% of the wage penalty associated with motherhood and that these variations also contribute to explaining why women who have children at an early age are particularly affected by the wage penalty. Finally, after examining the various reasons why women find themselves unemployed, Looze (2015) found that interruptions caused by family obligations have more significant short-term wage penalties than those caused by a layoff; however, these consequences persist for a long time among highly educated women.

It is interesting that analyses of gender disparities in pay and work schedules on well-known online job boards also confirm the results of previous research. Adams-Prassl (2021), utilizing data from two million tasks from the Amazon Mechanical Turk online job platform, found that women earn 20% less per hour on average. Additionally, the author noted that women are more likely to interrupt their working time on the platform, which has repercussions for their haste in completing tasks. Finally, Adams-Prassl (2021) found that workers with children are disproportionately affected by gender variations in working habits and hourly salaries.

Using Hong Kong 1996, 2001, and 2006 data, Yip & Wong (2014) study provides unequivocal evidence that age-specific reproduction rates have a detrimental impact on female income. More crucially, while males in identical situations are unaffected, the negative impacts of fertility on women's incomes are noticeably more substantial in occupations where women predominate. Our idea helps to explain why the gender gap widens with age because, in the early stages of women's professions, fertility rates tend to rise with age. While Waite (2016) study from Canada showed that the maternity penalty has decreased since the 1980s, particularly for female employees in well-paying positions. There are still significant benefits to marriage and fatherhood, but notable disparities exist by career.

4. Self-employment vs. wage employment: a gendered income divide

Many people believe that working for oneself is preferable to working as an employee for an organisation. According to Lawter et al. (2016) organisational issues, such as a declining workforce or limited job prospects, often prompt women to consider self-employment; however, they are also drawn to it by the numerous psychological and social benefits (e.g., flexibility, job satisfaction, work-life balance, independence).

Although more women are working for themselves, men and women continue to experience differing financial outcomes from this type of work. Similar structural segmentation patterns have been observed in Kazakhstan, where formal and informal self-employment exhibit widening unexplained wage differentials (Musayir et al., 2026). For example, Wirba et al. (2021) confirmed that male workers are paid more than female workers among self-employed. Also, Agussani (2020) support this idea and mention that in Indonesia, informal sector women continue to confront obstacles like prejudice, discrimination, and the wage gap. While Jung & Choi (2017) results suggest that in comparison to the self-employment sector, the wage sector has a more significant gender earnings difference. Additionally, the gender pay gap in the wage sector is primarily attributed to discrimination against women. On the other hand, the gender pay disparity in the field of self-employment is primarily attributable to productivity differences that are partially brought on by worker selectivity (Jung & Choi, 2017).

Another research from the US also confirms the statement above. Lawter et al. (2016) show that men and women who work for themselves earn significantly different salaries. Men made, on average, $54,959, while women made, on average, $28,554. Women make less money working for

themselves than males do, regardless of whether they have the same level of education, work experience, hours worked, or vocation (Lawter et al., 2016). Even Nix et al. (2016) supported this notion by a study of the factors influencing the gender disparity in self-employment wages in four Sub-Saharan nations: Ghana, Rwanda, Tanzania, and the Republic of the Congo. Finally, Mbratana & Fotie Kenne (2018) results point to an unexplained component in self-employment and an explained component in paid employment as the causes of the wage gap, which has significant ramifications, especially at the bottom of the income distribution.

5. Public vs. private sector: where does the gender pay gap persist?

According to Aderemi & Alley (2019), work in private sector is a frequently overlooked factor of gender inequality. They found that the public sector has a narrower gender pay gap than the private sector due to superior education and a more substantial income stream resulting from longer employment. Additionally, the findings in Nigeria show that there is a sticky floor in the private sector and a glass ceiling in the public sector (Aderemi & Alley, 2019). Moreover, the Mauritius study by Tandrayen-Ragoobur & Pydayya (2016) confirms these results. Over time, it was seen that the private sector has a larger unexplained wage disparity than the public sector, which is sometimes ascribed to discrimination (Tandrayen-Ragoobur & Pydayya, 2016). For example, in Bangladesh, employees in the public sector usually make 60% more than those in the private sector. Additionally, compared to the private sector, the gender wage gap is less pronounced in the public sector, and female employees in the public sector receive a significant portion of the salary premium (Anjum, 2016). Chakraborty (2020) and Taniguchi & Tuwo (2014) also support this statement.

Another study from Islamabad yielded quite interesting results. According to Ahmad & Naseer (2015), females experience discrimination not only from their immediate superiors but also from their coworkers. The study has also demonstrated that there is a gender bias in both public and private sector firms regarding promotions. Compared to male coworkers, women with the same qualifications and experience receive fewer promotions. Biased behavior is more prevalent in public institutions than in private ones (Ahmad & Naseer, 2015). Chakraborty (2020) also examined this issue and found that gender wage gap discrimination is often more substantial at the top than at the bottom, indicating that glass ceilings rather than sticky floors are more common for both men and women (Chakraborty, 2020). While Tandrayen-Ragoobur & Pydayya (2016) that the existence of sticky floors as evidence that the disparities in pay are greater at the bottom of the wage distribution than at the top.

A common observation is that there are fewer gender salary gaps in the public sector compared to the private sector. The reduction in gender discrimination in the public sector is partly to blame for this. Bradley et al. (2015) demonstrate that this conclusion is false, as the usual finding for the public sector is mainly influenced by the presence of sizable gendered occupational groups that have flat job hierarchies and low wage variance, such as nursing and teaching. Other public

sector jobs have substantial compensation discrepancies that cannot be attributed to workplace or employee factors. This suggests that gender discrimination is pervasive in some jobs in the public sector (Bradley et al., 2015).

Anastasiade & Tillé's (2017) work results are also quite important. They evaluated the estimated explained and unexplained components of the difference in average earnings between the private and public sectors in Switzerland. The authors demonstrate that discrimination occurs relatively uniformly in the public sector, in both lower-paying positions and jobs with higher salaries. However, in the private sector, discrimination is more prevalent in lower-paying positions than in those with higher income (Anastasiade & Tillé', 2017).

6. Rural vs. urban labor markets: geography and the gender pay divide

The participation of women in rural areas is limited in most spheres, including cultural, social, economic, health, and nutritional aspects, among others. According to Duhan et al. (2021), due to social norms and gender-based discrimination, the bulk of their labor is ignored, undervalued, and unappreciated. For example, Duhan et al. (2021) state that there is a significant gender gap in educational attainment, with women (42.90%) achieving higher rates than men (24.40%) in rural areas.

Raising rural real wages is seen as the most important policy for guaranteeing women's economic prosperity because women are more likely to work in rural areas of Asia than in metropolitan ones (Anon, 2019). The author also states that women are most affected by the stagnating rural wages since they make up the lowest paid workforce segment, are preferred in labor-intensive but low-paying activities, and are subject to occupational segregation and lower pay than men for the same work. The social system makes it more difficult for women, who are the least educated and have the fewest opportunities outside of agriculture, to relocate to urban areas in search of employment (Anon, 2019).

Another study conducted in 16 regions of Poland found that that the average earnings are more significant in more urbanised locations than in rural ones (Majchrowska & Strawinski, 2016). Authors argue that women make less money than men in every region, although the most urbanised regions have the highest gender wage gaps. While a significant portion of those gaps can be explained by disparities in worker characteristics, particularly by differences in sectoral employment structures (Majchrowska & Strawinski, 2016).

According to Yamamoto & Kaneko (2017), there is also a higher wage gap in regular employment for rural workers in Nigeria, though the gap decreases in casual employment. The findings of a later study show that, rural women face significant salary discrimination and less prospects to obtain regular employment, even though their educational attainment is on par with that of men or urban women. This may provide light on the alleged lack of incentives for females' education in rural Nepal (Yamamoto & Kaneko, 2017). Lastly, regression results from Indonesia's

2010 National Labor Force Survey (Sakernas) show that urbanization tends to benefit male workers more than female workers in terms of monthly salaries (Taniguchi & Tuwo, 2014).

7. Occupational segregation: the gendered distribution of work

According to Couppié et al. (2014), out of 54 strongly gendered professions in France, 26 have segregation that is primarily the result of school pre-sorting. Anjum (2016) argue that labor-intensive industries, such as agriculture, forestry, fisheries, production, and transportation, have the most significant gender pay disparity (56.4%). In contrast, management, technical, and professional professions exhibit the most minor disparity (22.1%). Moreover, Bartnik et al. (2022) study uses data from the U.S. Current Population Survey to analyse the male-female salary difference across occupational groups ranked by gender density. They find that the gender wage gap is consistently correlated with occupational feminisation, with male-dominated occupations having the lowest gender wage gap and the lowest average incomes for men and women. The highest male and female pay, the most significant gender pay disparity, and the least amount of wage discrimination are all found in occupations that are not gender-specific (Bartnik et al., 2022). In addition, Hedija (2017) observe that the number of women in the sector is the most significant factor explaining the variations in the gender pay gap among particular industries, according to statistics from the European Union Statistics on Income and Living Conditions (EU-SILC) for 24 EU member states.

Work hours, when men work much longer hours than women, is the factor that has the biggest impact on the wage differences in occupations (Fuchs, 2016). Another factor which could explain occupational segregation is math skills. According to Fuchs (2016), there is a significant advantage for men in math studies, and this has an impact on income differences as well. The inferior performance of women in math and science, which is evident as early as high school, is a result of fewer women taking advanced math and science exams, pursuing academic degrees, and pursuing professions in these subjects. Although there are many more women in academia than in other sectors, only 20 to 30% of students in technical fields are female nowadays. Males predominate in technology-related occupations, which eventually offer the highest-paying positions. There is a decline in employment even among women who have a degree in computer sciences, which may be related to the long hours that are typical in this field (Fuchs, 2016).

Nevertheless, authors of current systematic literature reviews (SLR) have observed that women have significantly improved their educational attainment over the past few decades, which has allowed them to enter some well-paying but traditionally male-dominated occupations, such as administration, law, and medicine. However, other professions, such as urban planning, architecture, engineering and remain strongly divided (Waite, 2016).

For example, according to research from Lebanon by Hejase et al. (2020), age, experience, family obligations, and physical prowess are all significant determinants of the wage differential in the agriculture sector. Nationality and educational attainment, on the other hand, had no effect on the salary disparity. The study also revealed a 40% salary discrepancy, which is a sizable pay difference, when the number of male and female employees and their average hourly wages were

taken into account (Hejase et al., 2020). Schwaab et al. (2019) also tried to analyse whether there are salary differences between the sexes in the agricultural labor market in rural Brazil. The primary findings indicate that men earn 157.62% more per hour than women do, with discrimination accounting for 108.38% of this difference (Schwaab et al., 2019)

Moreover, extreme gender inequality still exists in the construction sector. According to Adenugba & Oderinde (2017), in Nigeria, women are breaking into the construction industry. However, despite being a significant occupational group in this area, Nigerians experience some exploitation and prejudice. The authors conclude that because of society's patriarchal structure, women are cast in inferior roles at work. Moreover, according to Kumar (2013) over 35% of workers in India's construction sector are women, although they receive inadequate pay and face wage discrimination. Women do not have the same opportunity as males to become supervisors or progress in their careers (Kumar, 2013).

In addition, Fleming (2015) study of 112,990 workers in the US hospitality industry in 2010 found strong evidence that a sizable wage gap still exists between men and women in the sector, even after accounting for potential explanations. Being a woman was associated with a $620 income loss relative to the mean annual income of $11,271 across the overall hospitality sector. Being a woman costs the food service industry $542, equivalent to a mean income of $9,339, and the lodging sector $2,368, corresponding to a mean income of $17,783. The worst consequences, however, were for managers, where being a woman cost $6,617 compared to a mean income of $30,577 (21.6%) (Fleming, 2015). Ferreira Freire Guimarães & Silva (2016) came to the same conclusion and found out that Brazil's tourism industry also exhibits gender wage inequality. Also, according to Casado-Díaz et al. (2022) there is a sizable gender pay discrepancy in Spain's hotel industry. The authors contend that, in line with the glass ceiling phenomena, more qualified women in the industry face double punishment due to severe segregation into jobs that pay less and unfair wage treatment in comparison to their male counterparts (Casado-Díaz et al., 2022). Marfil Cotilla & Campos-Soria (2021) also studied the Spanish hospitality sector. They found that the primary sources of the discriminatory component are variations in human capital returns and vertical segregation. To conclude, according to Campos-Soria et al. (2015) external mobility in the hospitality industry is not only significantly higher than internal mobility, but it is also a leading cause of wage inequality.

8. Risk aversion and wage gaps: how attitudes shape earnings?

Jung et al. (2018) argue that the observed gender salary discrepancies could also be attributed to gender differences in risk choices. This idea is supported by other research all around the world. For example, according to Maitra et al. (2021), women have a lower likelihood to negotiate and tend to be more risk-averse than men. Together, the two factors reduce the gender wage difference by 29% and explain 15.5% of the wage gap's unexplained component. Also, in the experiment by Jung et al. (2018), between 40% and 77% of the gender salary discrepancy in the studies was explained by the stable career options that women were more likely than males to choose. At the

same time, Jung (2017) explored a novel approach to applying individual risk attitudes to representative Korean data and predicting the gender wage gap. The author states that the selection bias caused by risk attitudes leads to the salary disparity being overestimated. Because they are more risk averse, women often choose not to participate in the labor market altogether or, if they do, tend to work in the public sector, where salaries are typically less than in the private sector. Jung (2017) demonstrates that the gender pay gap can be partially explained by self-selection based on risk attitudes.

9. Starting wages: gender pay gaps from day one

Pay disparities between men and women have drawn the attention of labor economists since the early 1970s. However, there is currently little actual data regarding differences in starting salaries between the number of men and women entering the workforce. To fill this gap, Bredtmann and Otten (2014) used a unique dataset on graduates from German universities. The findings demonstrate that entry-level salaries for women are substantially less than those for men. They also discovered that gender variations in visible features do not account for a sizable fraction of this discrepancy (Bredtmann and Otten, 2014). Another researcher, Triventi (2013), also attempted to examine whether a gender gap exists among graduates across 11 European nations. According to decomposition analysis, the Czech Republic has a higher level of prejudice than the Nordic countries, with the United Kingdom and continental and southern European nations falling in between. The most significant variables influencing the gender difference among recent graduates are employment characteristics and working hours (Triventi, 2013).

10. Competition in the workplace: a gendered approach to earnings

As Heinz et al. (2016) state, compared to males who do the same work, women who opt to work under the non-competitive piece-rate remuneration model are paid significantly less. In their experiments, it always appears that women are not as rewarded for competing in the event. Instead, it seems as if women are penalised for selecting the non-competitive piece rate Heinz et al. (2016). Additionally, according to taste-based discrimination theories, market pressures are expected to eliminate discriminatory behavior. For example, Heyman et al. (2013) discovered that an ownership change results in an increase in the proportion of female employees, especially when there is no rivalry in the product market. Furthermore, the gender wage gap is decreased through increased competition (Heyman et al., 2013). Hirsch et al. (2021) findings a also in line with taste-based discrimination; they argue that competitive forces limit gender wage discrimination. Cukrowska-Torzewska & Magda (2020) findings also support competition theory. Finally, according to Majchrowska & Strawinski (2016) in regions, where employer competition is higher, the unexplained part of the gender wage gap – which is frequently ascribed to wage discrimination – tends to be less.

Conclusion

The present study conducts a systematic literature review of gender wage gap determinants from a human capital inequality perspective. Based on the analysis and synthesis of 63 refereed journal articles, it identifies 10 determinants grouped into three clusters: human capital endowments, structural labour market factors and institutional and cultural factors.

The wage discrimination experienced by women cannot be explained solely on the basis of the characteristics recorded in the ECHP that are generally considered to be relevant to wage setting such as education, innate ability and past working experience. The wage discrimination is therefore the result of discrimination in the process of forming, using, distributing and rewarding human capital throughout working life. This is the case for the labour market variables that have an impact on household resource allocation, gender stereotypes, discrimination by sex and sector, labour market segmentation, monopsony, competition, informality and discrimination.

Wage inequality in the labour market has been a topic of concern for many researchers in the last few decades. While improving education and increasing investment in human capital is seen as a key policy to reduce wage inequality, wage returns to education and experience are determined in the labour market institutions and labour market conditions. Motherhood penalty, sectoral differences, and occupational gender sorting are examples of how the life cycle events interact with labour market institutions and give rise to persistent gender wage differentials.

The purpose of this paper is to unify and relate a vast amount of scattered literature in labor economics. In three respects, the paper makes important contributions to labor economics. First, the paper relates the micro-behavior of endogenous human capital accumulation to the labor market institutions in which these decisions occur. Second, the paper presents the gender wage gap as an example of human capital disparities rather than a discriminatory issue. Third, it provides a framework for future empirical and policy work aimed at reducing labor market discrimination.

In the opinion of the reviewer, the gender wage gap is a highly complex problem that cannot be solved solely through equal pay policy. In order to tackle the gender wage gap, the author believes that interventions are needed at two stages of the production and pricing of human capital: 1. To prevent discriminatory hiring practises that cause gender-based occupational segregation. 2. To improve childcare and parental leave policies, as well as to increase labour market competition through anti-monopsony measures, to enable women to gain higher-level jobs and to prevent women from being excluded from the informal labour market.

Answers to the research questions raised above will have to be researched empirically by using longitudinal and panel data. A large number of the hypotheses raised in the background of the study are still untested. This calls in particular for a high quality panel data set of countries that differ in their institutions from the standard of developed OECD-countries. Developing and transition countries are appropriate candidates. In order to be able to develop the right policy for reducing human capital inequality dynamically over time for different subgroups of the population, one first needs to get a better understanding of the dynamics over time.

In short, the gender wage gap is not a wage-setting anomaly but a systemic consequence of unequal human capital formation, allocation and prices in labour markets.

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Determinants of Capital Structure of Companies in Kazakhstan

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ABSTRACT

This study examines the determinants of capital structure of companies in Kazakhstan over the period from 2000 to 2024. The main objective of the research is to identify the key factors influencing corporate leverage in the context of an emerging market. The analysis is based on data from companies operating in three major sectors of the Kazakhstani economy, selected due to their relevance to corporate financial decision-making.

The empirical analysis employs panel data regression techniques to evaluate the impact of both firm-specific and macroeconomic factors on capital structure. The firm-specific variables include profitability (ROA), revenue growth, firm size, firm age, liquidity, and net profit margin. In addition, the model incorporates macroeconomic variables such as GDPG, foreign direct investment (FDI), and inflation, as well as time dummy variables for the periods 2015 and 2020. This approach allows for a more comprehensive assessment of both internal and external determinants of leverage.

The regression results reveal that GDP has a statistically significant negative effect on leverage, indicating that higher economic growth is associated with lower reliance on debt financing. Inflation also demonstrates a negative relationship with leverage and is marginally significant, suggesting that macroeconomic instability may discourage borrowing. The dummy variable for 2020 is statistically significant and negative, reflecting the impact of external shocks during that period on firms' financing decisions. In contrast, firm-specific variables such as profitability, firm size, revenue growth, liquidity, and net profit margin are not statistically significant in explaining leverage within the sample. These findings suggest that macroeconomic conditions play a more important role than firm-level characteristics in determining capital structure in Kazakhstan.

The findings of this study have practical implications for managers, investors, and policymakers by providing insights into corporate financing behavior in Kazakhstan. Additionally, the study contributes to the limited empirical literature on capital structure in emerging markets.

Keywords: capital structure, leverage, Kazakhstan, panel data, profitability, firm size, liquidity

INTRODUCTION

1.1 Relevance and importance of capital structure decisions

Capital structure decisions represent one of the most important aspects of corporate finance, as they determine how firms finance their operations through a combination of debt and equity. The choice between internal and external financing sources has direct implications for a company's cost of capital, financial risk, and long-term sustainability.

In theoretical terms, the relevance of capital structure stems from its connection to firm value. According to classical financial theories, such as the Modigliani–Miller framework, capital structure may not affect firm value under perfect market conditions. However, in real-world settings characterized by taxes, transaction costs, and information asymmetry, financing decisions become critically important.

For companies operating in emerging markets, including Kazakhstan, capital structure decisions are even more complex. Firms face limited access to capital markets, higher borrowing costs, and increased exposure to macroeconomic instability. These factors significantly influence the availability and cost of external financing, making capital structure decisions more sensitive to external conditions.

Furthermore, the financial environment in Kazakhstan is characterized by ongoing institutional development and dependence on commodity markets. This creates additional challenges for firms when determining optimal leverage levels. As a result, understanding the determinants of capital structure in such an environment becomes highly relevant both academically and practically.

Overall, the importance of this topic lies in its ability to explain how firms balance risk and return, respond to economic conditions, and optimize their financing strategies.

1.2 Research Context and Focus

This study is conducted within the context of Kazakhstan's developing financial system and transitional economy. Over the past decades, Kazakhstan has experienced significant economic changes, including periods of rapid growth, financial crises, and structural reforms.

The research focuses on analyzing capital structure decisions of firms operating in key sectors of the economy over the period from 2000 to 2024. This time frame allows capturing both stable economic periods and external shocks.

The study specifically examines how both firm-level characteristics and macroeconomic factors influence leverage decisions.

1.3 Research Problem and Motivation

Despite the extensive theoretical and empirical literature on capital structure, there is still no consensus regarding the key determinants of leverage, particularly in emerging markets. Most existing studies are based on developed economies, where financial systems are more mature and access to capital is relatively stable.

In contrast, firms in Kazakhstan operate under different conditions, including higher economic volatility, limited financial market development, and stronger dependence on external factors. These characteristics create a research gap, as traditional theories may not fully explain capital structure decisions in this context.

The main research problem of this study is to identify which factors play a dominant role in determining leverage in Kazakhstan. Specifically, it seeks to understand whether firm-specific characteristics or macroeconomic conditions are more influential.

The motivation for this research arises from the need to provide empirical evidence for a relatively understudied market and to contribute to a better understanding of financial decision-making in emerging economies.

1.4 Research Aims, Objectives and Questions

The main aim of this study is to analyze the determinants of capital structure of companies in Kazakhstan using panel data methods.

To achieve this aim, the following objectives are defined:

- To examine the impact of firm-specific variables on leverage
- To analyze the role of macroeconomic factors in capital structure decisions
- To evaluate the effect of external shocks using time dummy variables
- To apply appropriate econometric techniques to ensure robust results

Based on these objectives, the study addresses the following research questions:

- What are the key determinants of capital structure in Kazakhstan?
- Do firm-specific variables significantly influence leverage?
- How do macroeconomic factors affect financing decisions?
- What is the impact of external economic shocks on corporate leverage?

1.5 Scientific and Practical Significance of the Study

The scientific significance of this study lies in its contribution to the existing literature on capital structure, particularly in the context of emerging markets. By focusing on Kazakhstan, the study provides new empirical evidence that helps to extend traditional financial theories to less developed financial systems.

The research also contributes methodologically by applying panel data techniques and robust estimation methods, ensuring the reliability of results.

From a practical perspective, the findings of this study are relevant for several stakeholders. Managers can use the results to improve their financial decision-making and optimize capital structure. Investors may gain insights into the financial behavior of firms, while policymakers can better understand how macroeconomic conditions influence corporate financing

1.6 Structure of the Thesis

This thesis is organized into five main chapters.

The first chapter introduces the research topic, outlines its relevance, and defines the research problem, objectives, and significance.

The second chapter presents the literature review, including theoretical frameworks and empirical studies related to capital structure.

The third chapter describes the research methodology, including data sources, variable specification, and econometric models.

The fourth chapter provides the empirical analysis and discusses the main findings of the study.

Finally, the fifth chapter summarizes the results, discusses their implications, and outlines limitations and directions for future research.

LITERATURE REVIEW

2.1 Introduction to the Literature Review

The purpose of this chapter is to review the existing theoretical and empirical literature related to capital structure and its determinants. Understanding previous research is essential for identifying the key factors that influence corporate leverage and for positioning the current study within the broader academic context.

Capital structure has been one of the central topics in corporate finance for decades. Numerous studies have attempted to explain how firms choose between debt and equity financing. However, despite extensive research, there is still no universal agreement regarding the determinants of capital structure.

This chapter first discusses the main theoretical frameworks that explain capital structure decisions. It then reviews empirical studies, with a particular focus on emerging markets. Finally, the chapter develops the conceptual framework and research hypotheses used in this study.

2.2 Theoretical Framework of Capital Structure

The theoretical foundation of capital structure is based on several key theories that attempt to explain how firms determine their optimal mix of debt and equity. The most influential among them are Trade-off Theory, Pecking Order Theory, and Agency Theory.

2.2.1 Trade-off Theory

Trade-off Theory suggests that firms determine their optimal capital structure by balancing the benefits and costs of debt financing. One of the primary advantages of debt is the tax shield, as interest payments are tax-deductible. This creates an incentive for firms to use debt in their financing structure.

However, excessive reliance on debt increases the risk of financial distress and bankruptcy. These costs include legal expenses, loss of customers, and reduced operational flexibility. As a result, firms aim to find an optimal level of debt where the marginal benefit equals the marginal cost.

In the context of emerging markets such as Kazakhstan, the application of Trade-off Theory may be limited. Higher economic volatility and weaker financial institutions increase the costs associated with debt, potentially leading firms to adopt more conservative capital structures.

2.2.2 Pecking Order Theory

Pecking Order Theory, developed by Myers and Majluf (1984), is based on the concept of information asymmetry between managers and external investors. According to this theory, firms prefer internal financing over external sources.

The financing hierarchy follows three main steps:

- Internal funds (retained earnings)
- Debt financing
- Equity issuance

This preference arises because external financing may signal negative information to the market, increasing the cost of capital.

Empirical evidence often supports this theory, particularly in emerging markets, where information asymmetry is more pronounced. In such environments, firms rely heavily on internal funds and may use debt only when internal resources are insufficient.

2.2.3 Agency Theory

Agency Theory focuses on conflicts of interest between different stakeholders, particularly between managers and shareholders, as well as between shareholders and creditors.

Debt can act as a disciplinary mechanism by limiting managerial discretion and reducing free cash flow available for inefficient investments. However, excessive debt may also create conflicts between shareholders and creditors, as shareholders may take on higher risk projects that benefit them but harm creditors.

In emerging markets, agency problems may be more significant due to weaker corporate governance and institutional frameworks. As a result, capital structure decisions may reflect not only economic considerations but also governance-related factors.

2.3 Empirical Review of the Literature

Empirical studies on capital structure provide mixed evidence regarding the determinants of leverage. In developed markets, firm-specific variables such as profitability, firm size, asset tangibility, and growth opportunities are commonly found to be significant.

Profitability is often negatively related to leverage, supporting the Pecking Order Theory. More profitable firms tend to rely on internal financing rather than debt. Firm size is usually positively related to leverage, as larger firms have better access to credit markets and lower bankruptcy risk.

However, the results are less consistent in emerging markets. Studies conducted in developing economies often find that macroeconomic factors play a more significant role. Variables such as GDP growth, inflation, and financial market development can strongly influence corporate financing decisions.

For example, economic growth may reduce firms' reliance on debt by increasing internal cash flows. Inflation may affect borrowing costs and investment decisions, while foreign direct investment can influence access to external financing.

In the case of Kazakhstan, empirical research remains limited. Existing studies suggest that firms are highly sensitive to macroeconomic conditions and external shocks. This highlights the importance of including both firm-specific and macroeconomic variables in the analysis.

2.4 Conceptual Framework and Hypotheses

Based on the theoretical and empirical literature, this study develops a conceptual framework that examines the relationship between leverage and its determinants.

The framework includes two main groups of variables:

- Firm-specific variables: ROA, revenue growth, firm size, firm age, liquidity, net profit margin
- Macroeconomic variables: GDP growth, FDI, inflation
- Time effects: dummy variables for 2015 and 2020

These variables are expected to influence the dependent variable, which is the debt-to-equity ratio.

2.4.1 Hypothesis Development

Based on the theoretical discussion, the following hypotheses are formulated:

H1: Profitability (ROA, Net Margin) is negatively related to leverage.

Firms with higher profitability rely less on debt financing.

H2: Firm size is positively related to leverage.

Larger firms have better access to debt markets.

H3: Revenue growth is positively related to leverage.

Growing firms require additional external financing.

H4: Liquidity is negatively related to leverage.

Firms with higher liquidity use internal funds instead of debt.

H5: Firm age is positively related to leverage.

Older firms have more established credit histories.

H6: GDP growth is negatively related to leverage.

Economic expansion reduces the need for borrowing.

H7: Inflation is negatively related to leverage.

Macroeconomic instability discourages borrowing.

H8: FDI has a significant effect on leverage.

External capital flows influence financing conditions.

H9: Time dummy variables capture the impact of external shocks.

2.5 Summary of the Literature Review and Rationale for the Study

This chapter reviewed the main theoretical and empirical literature on capital structure. The analysis shows that while traditional theories provide useful insights, their applicability may be limited in emerging markets.

Empirical studies suggest that the determinants of capital structure vary across countries and depend on institutional and macroeconomic conditions. In the case of Kazakhstan, the limited availability of empirical research highlights the need for further investigation.

The literature also indicates that both firm-specific and macroeconomic variables should be considered when analyzing capital structure decisions. Therefore, this study adopts a comprehensive approach by incorporating both types of factors into the empirical model.

The next chapter presents the research methodology used to test the proposed hypotheses and analyze the determinants of leverage in Kazakhstan.

METHODOLOGY

3.1 Research Design and Sample Selection

This study adopts a quantitative research design aimed at identifying the determinants of capital structure of companies in Kazakhstan. The quantitative approach is appropriate as it allows for the use of numerical data and econometric techniques to test relationships between variables.

The research is based on panel data, which combines both cross-sectional and time-series observations. This approach provides several advantages, including increased variability of data, improved efficiency of estimates, and the ability to control for unobserved heterogeneity across firms.

The sample consists of companies operating in key sectors of the Kazakhstani economy. These sectors were selected due to their relevance to corporate financial decision-making and the availability of data. The study covers the period from 2000 to 2024, which allows capturing both stable economic periods and external shocks.

In addition, the use of panel data regression is justified by its ability to capture both cross-sectional and time-series variations in the data. Compared to simple cross-sectional or time-series models, panel data provides more efficient and reliable estimates by increasing the number of observations and controlling for unobserved firm-specific effects.

A fixed effects model is employed in this study, as it allows controlling for time-invariant characteristics of firms that may influence capital structure decisions. This is particularly relevant in the context of Kazakhstan, where firms differ in terms of size, ownership structure, and industry conditions.

Furthermore, the results of diagnostic tests indicate the presence of heteroskedasticity, autocorrelation, and cross-sectional dependence. To address these issues, Driscoll–Kraay standard errors are applied, as they provide robust estimates under such conditions. This ensures the validity and reliability of the empirical findings.

3.2 Data Sources and Data Collection Procedures

The data used in this study is obtained from reliable financial databases and official statistical sources. Firm-level data is collected from financial statements, while macroeconomic variables are obtained from national and international databases.

The use of secondary data ensures consistency and comparability across firms and time periods. The dataset is structured in panel format, where each observation represents a specific firm in a given year.

Before conducting the analysis, the data is cleaned to remove missing values and outliers. Variables are transformed where necessary to ensure consistency and to meet econometric assumptions.

3.3 Specification of Variables

This study includes one dependent variable and several independent variables, which are divided into firm-specific and macroeconomic categories.

3.3.1 Dependent Variable (Leverage)

The dependent variable in this study is the debt-to-equity ratio, which measures the level of corporate leverage.

Debt-to-Equity is defined as:

$$Debt - to - Equity \ = \ Total\ Debt — Total\ Equity$$

3.3.2 Independent Variables (Firm-Specific)

- The firm-specific variables included in the model are:
- Return on Assets (ROA) – measures profitability

- Revenue Growth – captures growth opportunities
- Firm Size (ln) – measured as the natural logarithm of total assets
- Firm Age (ln) – logarithm of firm age
- Liquidity – reflects short-term financial stability
- Net Profit Margin – measures operational efficiency

Firm size was initially found to be non-stationary. Therefore, the first difference of firm size (ΔFirm Size) was used in the regression analysis to ensure stationarity.

Table 3.1 Variables Description

Variable	Definition	Expected Sign
Debt-to-Equity	Total Debt / Equity	—
ROA	Net Income / Assets	(-)
Revenue Growth	% change in revenue	(+)
Δ Firm Size	Change in ln(Assets)	(+)
Firm Age	ln(years)	(+)
Liquidity	Current Assets / Liabilities	(-)
Net Margin	Net Income / Revenue	(-)

3.3.3 Macroeconomic Variables

The model also includes macroeconomic variables:

- GDP Growth (GDPG) – economic performance
- FDI – foreign investment inflows
- Inflation – price stability

Additionally, time dummy variables are included:

- Dummy 2015
- Dummy 2020

These variables capture the effects of economic shocks.

3.4 Econometric Model Specification

The econometric model used in this study is specified as follows:

$$\begin{aligned} Debt-to-Equity_{it} &= \beta_0 + \beta_1 ROA_{it} + \beta_2 RevenueGrowth_{it} + \beta_3 \Delta FirmSize_{it} \\ &+ \beta_4 FirmAge_{it} + \beta_5 Liquidity_{it} + \beta_6 NetMargin_{it} + \beta_7 GDPG_t \\ &+ \beta_8 FDI_t + \beta_9 Inflation_t + \beta_{10} Dummy2015 + \beta_{11} Dummy2020 \\ &+ \varepsilon_{it} \end{aligned}$$

where:

- i represents firms
- t represents time
- ε is the error term

This model allows for analyzing both firm-level and macroeconomic effects on leverage.

3.5 Econometric Analysis and Diagnostic Tests

Before estimating the regression model, several diagnostic tests are conducted to ensure the validity of the results.

First, the stationarity of variables is tested using the Fisher-type unit root test. This is necessary to avoid spurious regression results. The results show that most variables are stationary, while firm size required transformation into first difference.

Second, multicollinearity is tested using the Variance Inflation Factor (VIF). The results indicate that all VIF values are below critical thresholds, suggesting no multicollinearity problem.

Third, the Wooldridge test is used to detect autocorrelation. The results indicate the presence of serial correlation in the data.

Fourth, heteroskedasticity is tested using the Modified Wald test, which confirms that error variances are not constant.

Finally, cross-sectional dependence is tested using Pesaran's test, which shows that firms are interdependent.

Given these issues, the study applies Driscoll–Kraay standard errors, which are robust to heteroskedasticity, autocorrelation, and cross-sectional dependence.

ANALYSIS AND FINDINGS

4.1 Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Debt-to-Equity	169	174.07	1107.51	0.08	13923.72
ROA	174	8.15	10.60	-22.13	51.13
Revenue Growth	175	46.17	243.81	-87.06	2204.06
Firm Size (ln)	185	10.88	2.10	3.55	15.16
Firm Age (ln)	190	2.86	0.90	0.00	4.13
Liquidity	185	4.01	31.07	0.06	423.63
Net Margin	183	10.49	18.82	-119.44	97.01
GDP Growth	200	5.82	3.66	-2.50	13.50
FDI	200	6.41	4.25	-0.24	13.01
Inflation	200	8.78	3.34	5.20	17.14

Descriptive statistics provide an initial overview of the dataset and help to understand the distribution and variability of the variables included in the analysis. The results presented in Table 4.1 summarize key statistical measures such as mean, standard deviation, minimum, and maximum values.

The debt-to-equity ratio shows a high level of variability across firms, indicating significant differences in leverage decisions. This suggests that companies in Kazakhstan adopt diverse financing strategies depending on their characteristics and external conditions.

Profitability indicators, including ROA and net profit margin, also demonstrate variation, reflecting differences in operational efficiency among firms. Liquidity levels vary considerably, indicating that firms have different capacities to meet short-term obligations.

Macroeconomic variables such as GDP growth, inflation, and FDI also show fluctuations over time, capturing changes in the broader economic environment. These variations are important as they may influence corporate financing decisions.

Overall, the descriptive statistics confirm that the dataset is suitable for further econometric analysis and that there is sufficient variation in the variables to identify meaningful relationships.

4.2 Correlation Matrix

Variable	Debt-to-Equity	ROA	Revenue Growth	Firm Size	Firm Age	Liquidity	Net Margin	GDPG	FDI	Inflation
Debt-to-Equity	1.0000									
ROA	-0.2223	1.0000								
Revenue Growth	0.0224	-0.0063	1.0000							
Firm Size	-0.1358	0.4158	-0.1944	1.0000						
Firm Age	-0.1341	0.2491	-0.2694	0.4453	1.0000					
Liquidity	-0.1167	0.1350	-0.0510	0.1101	0.0477	1.0000				
Net Margin	-0.4265	0.6585	-0.0656	0.5137	0.1224	0.2167	1.0000			
GDPG	-0.0720	0.0188	0.1891	-0.2110	-0.3400	0.2223	-0.0122	1.0000		

FDI	0.1186	-0.2024	0.0240	-0.2816	-0.3482	0.2176	-0.2605	0.1986	1.0000	
Inflation	-0.0465	-0.1181	-0.0584	0.0620	0.0582	-0.0865	-0.0392	-0.1391	0.2324	1.0000

The correlation matrix provides insights into the relationships between variables and helps to detect potential multicollinearity issues.

The results show that most correlations between independent variables are relatively low to moderate. This indicates that the variables do not exhibit strong linear relationships with each other.

The correlation between profitability measures and leverage appears to be negative, suggesting that more profitable firms tend to use less debt. However, correlation analysis alone is insufficient to establish causal relationships, and further regression analysis is required.

Overall, the absence of high correlations supports the validity of including all variables in the regression model.

4.3 Diagnostic Tests

Before conducting the regression analysis, it is necessary to verify that the assumptions of the econometric model are satisfied.

Stationarity

Variable	Inverse Chi-square (P)	Z-statistic	p-value	Stationarity
Debt-to-Equity	170.41	-7.46	0.0000	Stationary
ROA	63.62	-5.25	0.0000	Stationary
Revenue Growth	229.34	-12.39	0.0000	Stationary
Firm Size (ln)	68.47	-1.70	0.0443	Stationary
Δ Firm Size (ln)	141.63	-9.81	0.0000	Stationary
Firm Age (ln)	576.70	-22.98	0.0000	Stationary
Liquidity	134.15	-7.72	0.0000	Stationary
Net Margin	84.67	-6.82	0.0000	Stationary
GDP Growth	48.27	-4.68	0.0000	Stationary
FDI	147.18	-10.51	0.0000	Stationary
Inflation	62.54	-5.81	0.0000	Stationary
Dummy 2015	123.57	-9.40	0.0000	Stationary
Dummy 2020	140.54	-10.21	0.0000	Stationary

The results of the unit root test indicate that most variables are stationary at levels. However, firm size was found to be non-stationary in its original form. To address this issue, the first difference of firm size was used, which becomes stationary after transformation.

This ensures that the regression results are not spurious and that the relationships identified are valid.

Multicollinearity

Variable	Model (Leverage) VIF	1/VIF
GDP Growth	2.20	0.455
Net Margin	2.20	0.455
ROA	1.99	0.502
Dummy 2020	1.69	0.593
FDI	1.53	0.653
Firm Age (ln)	1.53	0.654
Δ Firm Size (ln)	1.45	0.692
Revenue Growth	1.43	0.698
Liquidity	1.35	0.742
Inflation	1.29	0.773
Dummy 2015	1.27	0.790
Mean VIF	1.63	—

The VIF results indicate that all values are well below the critical threshold. The mean VIF is low, confirming the absence of multicollinearity.

Autocorrelation

Test	Statistic	p-value	Conclusion
Wooldridge Test	F(1,7) = 43.845	0.0003	Autocorrelation present

The Wooldridge test rejects the null hypothesis of no autocorrelation, indicating that error terms are correlated over time.

Heteroskedasticity

Test	Statistic	p-value	Conclusion
Modified Wald Test	$\chi^2(8) = 4663.34$	0.0000	Heteroskedasticity present

The results confirm the presence of heteroskedasticity, suggesting that the variance of errors differs across firms.

Cross-Sectional Dependence

Test	Statistic	p-value	Conclusion
Pesaran Test	2.369	0.0179	Cross-sectional dependence present

The results indicate cross-sectional dependence, meaning that firms are affected by common shocks.

4.4 Choice of Estimation Method

Given the presence of heteroskedasticity, autocorrelation, and cross-sectional dependence, the use of standard estimation techniques may lead to biased results.

Therefore, this study employs Driscoll–Kraay standard errors, which provide robust estimates under these conditions. This approach ensures that the statistical inference remains valid.

4.5 Regression Analysis Results

Variable	**Coefficient**	**P-value**
Firm-Specific Variables		
ROA	17.78	0.312
Revenue Growth	-0.14	0.845
Net Profit Margin	-43.31***	0.000
Δ Firm Size (ln)	114.08	0.276
Firm Age (ln)	-189.46	0.411
Liquidity	10.69	0.693
Macroeconomic Variables		
GDP Growth	-97.41**	0.032
FDI	-3.89	0.624
Inflation	-39.43	0.118
Time Effects		
Dummy 2015	-1166.97**	0.021
Dummy 2020	-814.08*	0.079
Constant	(если есть)	(если есть)

4.5.1 Model 1: Firm-Specific Variables

The first model examines the impact of firm-specific variables on leverage.

The results show that net profit margin has a statistically significant negative effect ($p = 0.000$), indicating that more profitable firms rely less on debt. This supports the Pecking Order Theory.

Other variables such as ROA, firm size, liquidity, and revenue growth are not statistically significant, suggesting limited influence on capital structure.

4.5.2 Model 2: Including Macroeconomic Variables

The second model introduces macroeconomic variables.

The results indicate that GDP growth has a statistically significant negative effect on leverage ($p = 0.032$). This suggests that firms reduce borrowing during periods of economic growth.

Inflation and FDI are not statistically significant, although their coefficients are negative.

4.5.3 Model 3: Full Model with Time Dummies

The final model includes time dummy variables.

The results show that the 2015 dummy is statistically significant ($p = 0.021$), indicating that firms reduced leverage during that period.

The 2020 dummy is weakly significant ($p = 0.079$), reflecting the impact of global shocks.

Overall Interpretation

Overall, the regression results suggest that macroeconomic factors play a more important role than firm-specific variables in determining capital structure in Kazakhstan.

While profitability remains significant, most firm-level variables are not statistically significant. This indicates that external conditions and economic shocks are key drivers of leverage decisions.

DISCUSSION AND CONCLUSION

5.1 Interpretation of Results in the Context of Existing Literature

This section provides a detailed interpretation of the empirical findings and compares them with existing theoretical and empirical studies on capital structure.

The results of this study indicate that capital structure decisions in Kazakhstan are influenced by a combination of firm-specific and macroeconomic factors. However, the relative importance of these factors differs from the patterns commonly observed in developed markets.

In particular, the findings suggest that macroeconomic variables play a dominant role, while most firm-specific characteristics are not statistically significant. This highlights the importance of considering the institutional and economic environment when analyzing capital structure in emerging economies.

5.1.1 Profitability and Leverage

One of the most robust findings of this study is the statistically significant negative relationship between net profit margin and leverage. This result strongly supports the Pecking Order Theory, which argues that firms prefer internal financing over external sources of capital.

The negative coefficient indicates that firms with higher profitability rely less on debt financing. This can be explained by the fact that profitable firms generate sufficient internal funds, reducing their need to borrow. As a result, they avoid the costs and risks associated with debt, such as interest payments and financial distress.

This finding is consistent with a large body of empirical literature, which identifies profitability as a key determinant of capital structure. However, it is important to note that not all profitability measures behave in the same way. In this study, ROA is not statistically significant, which may suggest that different indicators capture different aspects of firm performance.

The significance of net profit margin highlights the importance of operational efficiency in financing decisions. Firms that are able to maintain high margins are less dependent on external financing and are therefore more financially stable.

5.1.2 Macroeconomic Factors and Leverage

The analysis reveals that macroeconomic variables, particularly GDP growth, have a significant impact on leverage. The negative relationship between GDP growth and leverage suggests that firms reduce their reliance on debt during periods of economic expansion.

This result can be explained by several factors. First, economic growth increases firms' revenues and internal cash flows, allowing them to finance investments without resorting to borrowing. Second, firms may adopt more conservative financing strategies during uncertain periods, especially in emerging markets where economic volatility is high.

The findings differ from some studies conducted in developed economies, where economic growth is often associated with increased borrowing. In contrast, the behavior observed in Kazakhstan reflects a more cautious approach to financial management.

Inflation also shows a negative relationship with leverage, although it is not statistically significant. This may indicate that firms perceive inflation as a source of uncertainty and risk, leading them to avoid debt financing. However, the lack of statistical significance suggests that this effect is not strong enough to be generalized.

FDI does not appear to have a significant impact on leverage. This may be due to the fact that foreign investment does not directly translate into increased access to debt financing for domestic firms.

Overall, the results emphasize the importance of macroeconomic stability in shaping corporate financial decisions.

5.1.3 Sectoral Differences

Although this study does not explicitly estimate separate models for different sectors, the observed variation in the data suggests that sectoral differences may play a role in capital structure decisions.

Firms operating in capital-intensive industries, such as energy or manufacturing, are likely to rely more on debt financing due to higher investment requirements. In contrast, firms in service sectors may depend more on internal funds.

Additionally, firms that are more integrated into global markets may have better access to external financing, which could influence their leverage decisions.

Future research could explore these differences in more detail by conducting sector-specific analyses or incorporating interaction effects into the model.

5.2 Practical Implications of the Study

The findings of this study have important implications for various stakeholders, including companies, policymakers, and investors.

5.2.1 Recommendations for Companies

The results suggest that companies should adopt a balanced approach to capital structure decisions, taking into account both internal performance and external economic conditions.

Firms with strong profitability should prioritize internal financing, as this reduces financial risk and dependence on external capital. At the same time, companies should carefully monitor macroeconomic indicators when planning their financing strategies.

In addition, firms should maintain financial flexibility to adapt to changing economic conditions. The significant impact of time dummy variables demonstrates that external shocks can influence leverage decisions, making it important for firms to be prepared for unexpected events.

Companies should also focus on improving operational efficiency, as this has been shown to reduce reliance on debt.

5.2.2 Recommendations for Policymakers

Policymakers play a crucial role in creating an environment that supports efficient capital structure decisions.

The findings of this study suggest that stable macroeconomic conditions are essential for corporate financial stability. Therefore, policies aimed at reducing economic volatility, controlling inflation, and promoting sustainable growth can have a positive impact on corporate financing.

In addition, improving the development of financial markets can enhance firms' access to capital. Strengthening regulatory frameworks, increasing transparency, and encouraging investment can contribute to more efficient allocation of resources.

Policymakers should also consider measures to reduce information asymmetry and improve corporate governance, as these factors influence financing decisions.

5.2.3 Recommendations for Investors

Investors can benefit from understanding the determinants of capital structure when making investment decisions.

The negative relationship between profitability and leverage suggests that highly profitable firms may be less risky, as they rely less on debt financing. This makes them potentially more attractive for long-term investment.

At the same time, the importance of macroeconomic factors indicates that investors should consider the broader economic environment when evaluating firms. Economic growth, inflation, and external shocks can all influence corporate performance and risk.

Investors should therefore adopt a holistic approach that combines firm-level analysis with macroeconomic assessment.

5.3 Limitations of the Study and Directions for Future Research

Despite its contributions, this study has several limitations that should be acknowledged.

First, the sample size is limited to available data, which may affect the representativeness of the results. Second, the study focuses on a specific set of variables, and other potentially important factors, such as corporate governance, ownership structure, or market conditions, are not included.

Third, the use of secondary data may introduce measurement errors or inconsistencies, particularly in emerging markets where data quality may vary.

In addition, the model does not account for dynamic adjustments in capital structure, which may occur over time.

Future research could address these limitations by expanding the dataset, incorporating additional variables, and applying dynamic panel models. Sector-specific analysis and comparative studies across countries could also provide deeper insights into capital structure decisions.

5.4 Conclusion

This study examined the determinants of capital structure of companies in Kazakhstan using panel data analysis over the period from 2000 to 2024.

The results show that macroeconomic factors, particularly GDP growth, play a significant role in determining leverage. Firms tend to reduce their reliance on debt during periods of economic expansion, reflecting increased internal financing capacity.

At the same time, profitability, measured by net profit margin, is found to be an important firm-specific determinant, with a strong negative relationship with leverage.

However, most other firm-specific variables, including firm size, liquidity, and revenue growth, are not statistically significant. This suggests that capital structure decisions in Kazakhstan are influenced more by external economic conditions than by internal firm characteristics.

Overall, the study contributes to the limited empirical literature on capital structure in emerging markets and provides valuable insights for managers, investors, and policymakers.

The findings highlight the importance of considering both firm-level and macroeconomic factors in financial analysis and emphasize the need for further research in this area.

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The Role of Artificial Intelligence in Building Consumer Trust in Digital Marketing

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Artificial intelligence (AI) has become one of the most transformative technologies in the digital economy, fundamentally reshaping marketing practices and consumer interactions. In recent years, rapid advancements in machine learning, big data analytics, and automation technologies have enabled organizations to shift from traditional marketing approaches to more intelligent, data-driven strategies. In the context of digital marketing, AI allows firms to process vast amounts of structured and unstructured data, identify hidden patterns, and generate predictive insights about consumer behavior. These capabilities enable marketers to better understand customer needs, segment audiences more precisely, and deliver highly personalized experiences.

One of the most significant contributions of AI to digital marketing lies in its ability to enhance personalization. Through algorithms that analyze browsing history, purchase behavior, and user preferences, companies can provide tailored recommendations and targeted advertisements. This level of personalization not only improves user experience but also increases the likelihood of consumer engagement and conversion. In addition, AI-powered chatbots and virtual assistants offer real-time customer support, allowing businesses to respond to inquiries efficiently and consistently. These technologies reduce operational costs while improving service quality, thereby strengthening customer relationships.

Furthermore, AI contributes to marketing optimization by enabling real-time decision-making. Traditional marketing strategies often rely on historical data and delayed feedback, whereas AI systems can continuously learn from new data and adjust strategies dynamically. For example, programmatic advertising platforms use AI to automatically optimize ad placements, ensuring that content reaches the most relevant audiences at the right time. Similarly, predictive analytics can forecast future consumer behavior, allowing firms to proactively design marketing campaigns. As a result, AI not only enhances efficiency but also increases the effectiveness of marketing efforts.

However, despite these advantages, the widespread adoption of AI technologies raises an important issue: consumer trust. Trust is a fundamental element in any exchange relationship, but it becomes particularly critical in digital environments where direct human interaction is limited or entirely absent. In traditional face-to-face transactions, trust can be established through interpersonal communication, physical presence, and social cues. In contrast, digital interactions are mediated by technology, which creates a sense of distance and uncertainty for consumers.

In online environments, consumers often rely on digital interfaces, algorithms, and automated systems to make purchasing decisions. This reliance introduces a higher degree of perceived uncertainty, as consumers cannot directly verify product quality, assess seller credibility,

or fully understand how decisions are made. As a result, trust becomes a key determinant of consumer behavior. Without sufficient trust, consumers may hesitate to share personal information, complete transactions, or engage with digital platforms, regardless of how advanced or efficient the underlying technology may be.

The issue of trust becomes even more complex in the context of AI. While AI enhances convenience and efficiency, it also introduces new forms of uncertainty. One of the main concerns is the lack of transparency in AI systems. Many AI algorithms operate as "black boxes," meaning that their decision-making processes are not easily understandable to users. This opacity can lead to skepticism and reduce consumers' willingness to rely on AI-driven recommendations. For example, when a recommendation system suggests a product, consumers may question how and why that suggestion was generated, especially if the logic behind it is not clearly explained.

Another important concern relates to data privacy. AI systems rely heavily on data, including personal and behavioral information, to function effectively. While data collection enables personalization and improved service, it also raises questions about how data is stored, used, and protected. Consumers may worry about unauthorized access, data breaches, or misuse of their personal information. These concerns can significantly undermine trust, even if the technology itself is highly efficient. Therefore, the success of AI in digital marketing depends not only on technological capabilities but also on the ability of organizations to address privacy and security issues.

In addition, ethical considerations play a crucial role in shaping consumer trust. Issues such as algorithmic bias, discrimination, and lack of accountability can negatively affect public perception of AI systems. If consumers believe that AI decisions are unfair or biased, their trust in the system may decrease. For example, biased recommendation algorithms may favor certain products or groups, leading to unequal treatment of users. Addressing these ethical challenges is essential for building long-term trust in AI-driven marketing systems.

Previous research has demonstrated that trust is closely related to perceived risk in online environments. Perceived risk refers to the degree of uncertainty and potential negative consequences that consumers associate with a particular action, such as making an online purchase. In digital contexts, perceived risk can take multiple forms, including financial risk, privacy risk, and performance risk. Consumers often experience uncertainty regarding product quality, data security, and transaction reliability. Studies indicate that higher perceived risk leads to lower levels of trust, which in turn reduces purchase intention [1].

The relationship between risk and trust is particularly important in understanding consumer behavior in digital environments. When consumers perceive a high level of risk, they are more likely to adopt cautious behavior, such as avoiding transactions or seeking additional information. Conversely, when perceived risk is low, consumers are more willing to engage with digital platforms. This inverse relationship highlights the importance of risk reduction strategies in

building consumer trust. For example, mechanisms such as secure payment systems, clear return policies, and third-party certifications can help reduce perceived risk and enhance trust.

At the same time, perceived usefulness and ease of use positively influence consumer acceptance of online systems [2]. According to the Technology Acceptance Model (TAM), these two factors are key determinants of technology adoption. Perceived usefulness refers to the extent to which a consumer believes that using a particular system will improve their performance or provide value, while perceived ease of use refers to the degree to which a system is perceived as user-friendly and easy to operate. When consumers perceive a system as useful and easy to use, they are more likely to adopt it and develop trust in it.

In the context of AI, perceived usefulness may be reflected in the system's ability to provide accurate recommendations, save time, and enhance decision-making. Perceived ease of use, on the other hand, may relate to the simplicity of the interface and the clarity of interactions with AI systems. These factors contribute to a positive user experience, which in turn strengthens trust. However, if AI systems are perceived as complex, confusing, or difficult to use, consumer trust may be negatively affected.

These findings suggest that trust acts as a mediating factor between technological features and consumer behavior. In other words, the impact of AI technologies on consumer behavior is not direct but is influenced by the level of trust that consumers have in these technologies. Even if a system is highly advanced, it may not lead to increased usage or purchase intention unless consumers trust it. Therefore, building trust is a critical step in the successful implementation of AI in digital marketing.

In summary, while artificial intelligence offers significant opportunities to enhance digital marketing through personalization, automation, and data-driven decision-making, it also introduces new challenges related to trust and risk. The balance between these factors determines the effectiveness of AI in influencing consumer behavior. Understanding the complex relationship between AI, trust, and perceived risk is therefore essential for both researchers and practitioners in the field of digital marketing.

The integration of AI into digital marketing introduces both opportunities and challenges for trust formation. On the one hand, AI enhances user experience through personalization, automation, and predictive analytics. For example, recommendation systems can provide relevant product suggestions, while chatbots can offer real-time customer support. These features improve convenience and efficiency, thereby strengthening consumer trust. On the other hand, AI systems are often perceived as opaque and difficult to understand. The "black-box" nature of algorithms, combined with concerns about data privacy and surveillance, may increase perceived risk and reduce trust [3]. Therefore, AI plays a dual role in digital marketing: it can both build and undermine consumer trust.

To better understand this relationship, this study develops a conceptual model that integrates traditional trust theories with specific AI-related factors. The model assumes that

consumer trust is not a static reaction but a result of distinct AI-driven elements, namely transparency, personalization, and data security. Transparency refers to the "explainability" of the AI how clearly the system communicates its decision-making logic to the user. Personalization involves the system's ability to tailor experiences to individual needs, creating a sense of "benevolence" or care. When these elements are supported by rigorous data security, they function as high-quality signals that demonstrate the system's competence and integrity, thereby laying the groundwork for a trusting relationship.

Within this framework, trust serves as the pivotal psychological bridge between the technological features of the AI and the user's ultimate purchase intention. While transparency and personalization provide the functional and emotional "inputs," it is the internal state of trust that converts these inputs into a willingness to commit to a transaction. In digital environments characterized by high information asymmetry, trust acts as a complexity-reduction mechanism. By fostering a belief in the reliability of the AI-driven platform, trust effectively lowers the consumer's psychological barriers, making the transition from "browsing" to "purchasing" a more seamless and confident process.

At the same time, the model recognizes that this relationship does not exist in a vacuum; perceived risk serves as a critical negative moderator. Even when an AI system is perceived as transparent or highly personalized, a high level of perceived risk whether financial, privacy-related, or performance-based can dampen or "bottleneck" the positive influence of trust on purchase intention. In this moderating role, risk acts as a boundary condition: if the perceived threat of data misuse or system failure exceeds a certain threshold, the strength of the trust-purchase link is significantly weakened. Therefore, the model posits that the success of AI adoption depends not only on building positive trust drivers but also on actively suppressing these inhibitory risk factors.

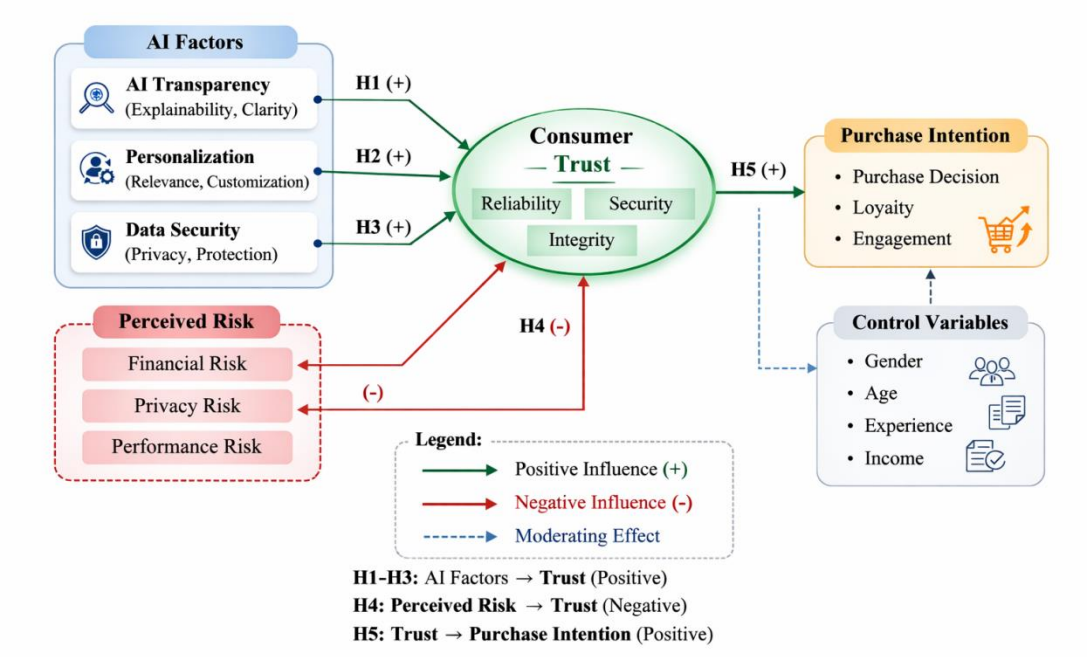


Figure 1. Conceptual model of AI and consumer trust in digital marketing

The theoretical foundation of the proposed model is rooted in the classic Technology Acceptance Model (TAM), which posits that user acceptance is primarily driven by two cognitive determinants: perceived usefulness and perceived ease of use [2]. While TAM has been highly influential in explaining the functional motivations behind technology adoption, modern digital interactions have become increasingly complex. Consequently, subsequent scholarly work has sought to enhance the model's explanatory power by integrating psychological variables, most notably trust and perceived risk, to better capture the nuances of user behavior in online and e-commerce environments [4].

In this context, trust is conceptualized as a psychological state wherein an individual is willing to accept vulnerability and rely on a system or entity despite the inherent uncertainties of the digital landscape [5]. Unlike face-to-face interactions, trust in virtual environments is mediated by various technical and informational cues. These include system reliability, which ensures consistent performance; information quality, which relates to the accuracy and relevance of the data provided; and robust security mechanisms that safeguard user privacy. Together, these factors serve as the critical infrastructure that mitigates the perceived "leap of faith" required when engaging with new technologies.

By synthesizing TAM with trust theory, this study proposes a more holistic framework that accounts for both the functional and relational aspects of technology adoption. Perceived ease of use and usefulness do not operate in a vacuum; rather, they are often reinforced by the presence of a trusted interface. For instance, when a system demonstrates high security and reliability, it reduces the cognitive burden on the user, thereby enhancing the overall perception of utility. This

integrated approach allows for a deeper exploration of how trust acts as a bridge between a user's initial hesitation and their eventual commitment to utilizing a digital platform.

Perceived risk remains a formidable barrier to the formation of trust, acting as a cognitive tax that users must calculate before engaging with a new system. This construct is rarely monolithic; rather, it is composed of several distinct dimensions, including financial risk, privacy risk, and performance risk [4]. Financial risk involves the potential for monetary loss or fraudulent transactions, while performance risk pertains to the possibility that the technology will fail to deliver its promised utility. In modern digital ecosystems, these risks do not exist in isolation but often overlap, creating a cumulative sense of uncertainty that can deter even the most tech-savvy users from full adoption.

Empirical studies consistently demonstrate that consumers are particularly sensitive to privacy concerns in digital environments, a sensitivity that is significantly amplified when personal data is collected and processed by AI systems [6]. Because AI technologies are inherently data-driven, relying on massive datasets to refine their algorithms and predictive capabilities, the "black box" nature of these systems often leads to user apprehension. Users are frequently concerned with how their data is being "mined" and whether the AI might uncover sensitive patterns or associations that they did not explicitly consent to share, leading to a heightened state of perceived vulnerability.

As AI technologies rely heavily on the continuous ingestion of data, concerns regarding misuse, unauthorized access, or algorithmic bias become more significant to the end-user. Consequently, the implementation of robust data security measures is no longer just a technical requirement; it is a strategic necessity for building and sustaining trust. By prioritizing transparency in data processing and deploying advanced encryption or anonymization protocols, organizations can mitigate the perceived risk of data breaches. Ensuring a secure environment effectively lowers the "trust threshold," allowing users to focus on the functional benefits of the AI rather than the potential for privacy infringement.

At the same time, AI-driven personalization plays a crucial role in enhancing trust. Personalized recommendations reduce information overload and improve decision-making efficiency. When consumers perceive that a system understands their preferences and provides relevant suggestions, they are more likely to trust it [7]. However, excessive personalization may also lead to discomfort if consumers feel that their privacy is being violated.

Transparency is a critical antecedent in the formation of digital trust, acting as the primary mechanism through which "black-box" technologies become accessible to the average user. AI systems that provide clear, human-readable explanations of their decisions are significantly more likely to be trusted than those that operate in an opaque manner. In this context, transparency is not merely the disclosure of data but the active communication of the system's underlying logic. By making the decision-making process visible, organizations demonstrate a commitment to accountability, which directly signals to the consumer that the system is functioning within ethical and predictable boundaries.

The emergence of Explainable AI (XAI) serves as a technical bridge to reduce the inherent uncertainty associated with complex algorithms. XAI functions by deconstructing the "why" and "how" behind a specific output, helping consumers understand exactly how their personalized recommendations or data assessments are generated. When a user can trace the path from their input to the AI's suggestion, the "psychological distance" between the human and the machine is minimized. This reduction in perceived complexity transforms a potentially intimidating technological encounter into a predictable and manageable interaction, thereby lowering the cognitive barriers to adoption.

This focus on openness aligns with previous findings that information clarity and system transparency positively influence trust [8]. In the broader digital environment, users rely on clarity to assess the integrity of the platform they are engaging with. When an AI system provides high-quality, clear information regarding its operations, it validates the user's autonomy and allows for informed consent. Ultimately, this transparency does more than just inform; it reinforces the reliability of the system, ensuring that the user feels empowered rather than manipulated by the technology.

To operationalize these concepts, the following variables are defined:

table 1.

Variables and their descriptions

Variable	Description
AI Transparency	The degree to which AI decisions are understandable
Personalization	The extent of customized recommendations
Data Security	Protection of user data and privacy
Perceived Risk	Consumer perception of uncertainty and potential loss
Consumer Trust	Confidence in the digital platform
Purchase Intention	Likelihood of buying behavior

The research methodology of this study is grounded in a quantitative approach, which is widely adopted in the field of digital marketing and consumer behavior analysis. Quantitative research allows for the systematic examination of relationships between variables and provides statistically reliable results. In this study, survey data is utilized as the primary source of empirical evidence, as it enables the collection of standardized responses from a relatively large number of participants. This approach is particularly suitable for investigating abstract constructs such as trust, perceived risk, and attitudes toward artificial intelligence.

Respondents are selected from individuals who have prior experience with digital platforms, including online shopping websites, mobile applications, and AI-driven services such

as recommendation systems or chatbots. The selection of experienced users is essential, as it ensures that participants are familiar with the context of digital interactions and can provide informed responses. In addition, the sample may include users from different demographic backgrounds, such as age groups, educational levels, and income categories, in order to enhance the generalizability of the findings.

The data collection instrument is a structured questionnaire consisting of multiple sections. The first section gathers demographic information, which is useful for understanding the characteristics of the sample and for conducting further analysis if needed. The second section focuses on measuring consumer trust, which is treated as the central variable of the study. Trust is operationalized as the degree of confidence that consumers have in digital platforms and AI systems to perform reliably, securely, and in their best interest. The third section measures perceived risk, including concerns related to privacy, financial security, and uncertainty in AI-driven decision-making. The final section evaluates AI-related factors such as transparency, personalization, and data security.

Each construct is measured using multiple items based on established scales from previous research, ensuring both reliability and validity. For example, trust can be assessed through statements related to reliability, security, and integrity, while perceived risk can be measured through items reflecting uncertainty and potential loss. Respondents are asked to indicate their level of agreement using a Likert scale, typically ranging from “strongly disagree” to “strongly agree.” This standardized format allows for easy quantification and statistical analysis.

The analytical approach involves the use of correlation and regression techniques to test the proposed hypotheses. Correlation analysis is first conducted to examine the relationships between variables and to identify whether significant associations exist. Following this, regression analysis is used to determine the strength and direction of the relationships, particularly the impact of AI-related factors on consumer trust and the effect of trust on purchase intention. These methods are widely used in previous studies on online shopping behavior and technology adoption, providing a solid methodological foundation for this research [1].

The expected results of the study suggest that AI-related factors have a significant and measurable impact on consumer trust. In particular, transparency is anticipated to play a crucial role in trust formation. When AI systems provide clear explanations of how decisions are made, consumers are more likely to perceive them as reliable and fair. Similarly, data security is expected to have a strong positive influence on trust, as consumers place high importance on the protection of their personal information. In an environment where data breaches and privacy violations are common concerns, robust security measures can significantly enhance consumer confidence.

Personalization is also expected to positively influence trust, although its effect may vary depending on context. On the one hand, personalized recommendations improve user experience by making interactions more relevant and efficient. On the other hand, excessive personalization may lead to concerns about privacy and data usage, which can reduce trust.

Therefore, the impact of personalization is likely to be conditional, depending on how it is implemented and communicated to users.

At the same time, perceived risk is expected to have a negative effect on consumer trust. When users perceive high levels of risk, such as uncertainty about data usage or fear of financial loss, they are less likely to trust digital platforms. This finding is consistent with earlier research, which identifies perceived risk as one of the main barriers to online consumer behavior [9]. The negative relationship between risk and trust highlights the importance of risk reduction strategies in digital marketing.

The discussion of the findings emphasizes that artificial intelligence is not inherently trustworthy. Rather, trust is a result of how AI technologies are designed, implemented, and perceived by users. Simply introducing advanced technologies does not guarantee higher trust; instead, organizations must actively manage consumer perceptions. Transparency, communication, and user control are essential components of this process. For example, providing users with clear information about how their data is collected and used can reduce uncertainty and increase trust.

Moreover, ethical considerations play a critical role in shaping trust in AI systems. Issues such as data protection, algorithmic bias, and fairness must be carefully addressed to ensure that AI applications are aligned with consumer expectations. Failure to address these concerns may lead to distrust and resistance, even if the technology itself is highly efficient. Therefore, companies must adopt a responsible approach to AI implementation, balancing innovation with ethical responsibility.

Another important implication of the study is that trust should be viewed as a dynamic and context-dependent construct. Consumer trust can change over time based on experiences, information, and external factors such as regulations or public discourse. For instance, increased awareness of data privacy issues may lead to higher sensitivity to perceived risks. As a result, organizations must continuously monitor and adapt their strategies to maintain trust in a rapidly evolving digital environment.

In conclusion, this study demonstrates that artificial intelligence plays a crucial role in shaping consumer trust in digital marketing. While AI technologies provide significant benefits in terms of efficiency, personalization, and decision-making, they also introduce new challenges related to risk and transparency. The findings suggest that trust acts as a key mediator between AI applications and consumer behavior, influencing purchase intention and long-term engagement.

The balance between technological innovation and ethical responsibility is therefore essential. Companies that prioritize transparency, data security, and user-centered design are more likely to build and sustain consumer trust. Conversely, neglecting these aspects may lead to increased skepticism and reduced adoption of AI-driven services.

Future research should explore additional factors that may influence trust in AI, such as cultural differences, regulatory frameworks, and the role of explainable AI. Comparative studies across different countries or industries may provide deeper insights into how trust is formed and

maintained in diverse contexts. Furthermore, longitudinal studies could examine how consumer trust evolves over time as AI technologies continue to develop.

Overall, this study contributes to the growing body of literature on artificial intelligence and digital marketing by highlighting the central role of trust and providing a comprehensive framework for understanding its determinants in the digital age.

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Современные подходы к мотивации персонала на предприятиях нефтеперерабатывающего комплекса: теория и практика

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Аннотация:

Статья посвящена исследованию современных подходов к мотивации персонала в нефтеперерабатывающем комплексе, где высокая технологическая сложность, риски и повышенные требования к квалификации работников делают проблему мотивации особенно актуальной. Цель исследования заключается в выявлении ключевых факторов, формирующих эффективность мотивационных систем, и определении специфики мотивации в условиях нефтеперерабатывающего производства. Во введении рассмотрены теоретические подходы к мотивации, роль корпоративной культуры, организационной сопричастности, качества трудовой жизни и карьерного развития. Методологическая основа исследования включает анализ научной литературы и качественный контент-анализ официальных отчётов Компании с Ограниченной Ответственностью «Аджип Карачаганак Б.В.», что позволило оценить реальные механизмы стимулирования и определить их соответствие современным отраслевым стандартам. Полученные результаты показывают, что эффективность мотивации в нефтеперерабатывающем комплексе обеспечивается сочетанием материальных стимулов, развитой корпоративной культуры, высоким уровнем безопасности труда, возможностями профессионального развития и поддержанием эмоционального благополучия сотрудников, а нематериальные факторы приобретают всё более значимую роль. Основные выводы исследования подтверждают необходимость применения интегрированных мотивационных моделей, учитывающих психологические, организационные и социокультурные особенности отрасли. Интерпретация результатов демонстрирует, что успешная мотивационная система способствует снижению текучести кадров, повышению производственной эффективности и укреплению корпоративной устойчивости.

Ключевые слова: мотивация персонала; нефтеперерабатывающий комплекс; корпоративная культура; качество трудовой жизни; профессиональное развитие.

I. Введение

В условиях усиления глобальной конкуренции, повышенной волатильности сырьевых рынков и ускоряющейся технологической трансформации нефтеперерабатывающий комплекс (НПК) сталкивается с необходимостью обеспечения высокой эффективности использования трудовых ресурсов. Предприятия отрасли функционируют в сложной производственной среде, характеризующейся высокой степенью автоматизации процессов,

жёсткими требованиями к безопасности, потребностью в высококвалифицированном персонале и постоянным внедрением инновационных технологий. В этих условиях вопросы мотивации работников становятся ключевым фактором устойчивого развития, влияющим не только на производительность труда, но и на качество продукции, соблюдение технологических регламентов, дисциплину, повышение культуры безопасности и минимизацию производственных рисков.

Современные исследования подтверждают, что традиционные формы мотивации – преимущественно материальные стимулы – в нефтеперерабатывающей отрасли уже не обеспечивают необходимого уровня вовлечённости и преданности персонала. Появляется необходимость в комплексных и гибких системах мотивации, сочетающих материальные и нематериальные стимулы, современные цифровые инструменты оценки эффективности, элементы корпоративной культуры и практики социально-психологической поддержки сотрудников. При этом специфика НПК – повышенная опасность производственных процессов, строгость регламентов, ответственность за предотвращение аварий и экологических инцидентов – делает задачу разработки эффективных мотивационных механизмов особенно значимой и требует учета отраслевых особенностей.

Цель статьи заключается в анализе современных теоретических подходов и практических методов мотивации персонала на предприятиях нефтеперерабатывающего комплекса, а также в обобщении и оценке наиболее эффективных инструментов стимулирования работников с учётом отраслевой специфики и современных тенденций развития НПК.

II. Обзор литературы

Современные исследования в области мотивации персонала предприятий нефтегазовой и нефтеперерабатывающей отрасли подчеркивают необходимость комплексного рассмотрения факторов, влияющих на вовлеченность, продуктивность и удовлетворённость работников. В научном дискурсе доминирует междисциплинарный подход, объединяющий элементы организационной психологии, стратегического управления персоналом, социологии труда и промышленной экономики. При этом в последние годы акценты смещаются в сторону изучения нематериальных аспектов мотивации, организационной культуры, сопричастности работников и качества трудовой жизни, особенно в условиях цифровизации, усложнения технологических процессов и возрастания требований к безопасности.

Одним из фундаментальных направлений анализа является влияние корпоративной культуры на мотивацию персонала. В работе И. Н. Глазковой и К. В. Батяевой (2020) корпоративная культура рассматривается как системообразующий фактор мотивации работников нефтегазовой отрасли. Авторы, исследуя примеры ПАО «ЛУКОЙЛ», ОАО «Газпром» и ПАО «НК Роснефть», демонстрируют, что корпоративные нормы, ценности и ритуалы формируют не только трудовое поведение, но и степень вовлечённости сотрудников. Тем самым корпоративная культура выступает не просто фоном мотивации, а

ее структурообразующим элементом.

Продолжая развивать тему нематериальных аспектов мотивации, С. М. Самохвалова и А. Н. Малюгина (2022) сосредотачиваются на феномене организационной сопричастности персонала – глубокой психологической связи сотрудника с организацией. Авторы уточняют понятие организационной сопричастности применительно к нефтегазовой отрасли, характеризующейся высокой степенью ответственности, рисками и необходимостью соблюдения регламентов. Исследователями представлена логическая модель идентификации мотивационного профиля работников, подчеркивающая необходимость сочетания индивидуальных и коллективных стимулов. Систематизация факторов организационной сопричастности показывает, что её формирование требует адресной работы с ценностями, эмоциональной вовлечённостью, идентификацией с корпоративной миссией и укреплением внутрикорпоративных коммуникаций. Таким образом, в нефте- и газодобывающей отрасли нематериальные аспекты играют роль не меньшую, чем материальные стимулы, поскольку эмоциональная устойчивость и осознанность работников напрямую связаны с безопасностью производства.

Вопрос совершенствования системы мотивации через управление организацией труда и кадровыми процессами затрагивают Н. А. Владимиров и Е. О. Аквабза (2020). В центре их исследования – проблема текучести кадров, обусловленная недостатками существующих мотивационных практик. Авторы выявляют слабые стороны традиционных систем стимулирования: ограниченный набор материальных стимулов, слабая связь мотивации с результатами работы, отсутствие мер, направленных на вовлечение сотрудников в улучшение производственных процессов. Предложенная программа совершенствования включает развитие механизмов участия работников, системы признания заслуг, увеличение прозрачности карьерных траекторий.

Многочисленные исследования подчеркивают, что мотивация в нефтегазовой отрасли невозможна без эффективной системы стимулирования. Именно эту тему раскрывают Е. М. Кобозева и М. С. Тараненко (2022). Авторы анализируют структуру мотивационной системы предприятий нефтегазовой отрасли и выделяют ключевые факторы её эффективности: уровень оплаты труда, безопасность труда, возможности карьерного продвижения, поддержка профессионального развития. Указывая, что значительная часть производственных процессов требует высокой компетентности и дисциплины, исследователи приходят к выводу о необходимости интеграции материальных и нематериальных стимулов. Тем самым их работа дополняет исследования, ориентированные на корпоративные и культурные механизмы мотивации.

Отдельного внимания заслуживают исследования В. Д. Фадеева (2024; 2025), предлагающего современную концептуализацию мотивации в условиях цифровизации и перехода к Индустрии 4.0–5.0. В статье 2024 года Фадеев фокусируется на стимулировании инновационной активности персонала нефтегазовой отрасли. Он демонстрирует, что традиционные методы материального стимулирования оказываются недостаточными для

развития инициативности и творчества персонала. Исследователь классифицирует наиболее эффективные инструменты мотивации, применяемые в компаниях «Транснефть» и «Сургутнефтегаз», указывая на важность гибридных моделей стимулирования, где сочетаются оплата результатов, поддержка инициатив, диалоговый менеджмент и культурные механизмы, направленные на формирование инновационной среды.

В другой работе (2025) Фадеев предлагает кластерный подход к моделированию систем мотивации, позволяющий учитывать региональные, отраслевые и технологические особенности предприятий нефтегазового сектора. По данным автора, более 65% работников малых и средних нефтегазовых предприятий испытывают недостаточную удовлетворённость мотивационной системой. Ключевой вывод Фадеева состоит в том, что существующие модели мотивации требуют адаптации к вызовам цифровизации, расширению автоматизированных систем и росту требований к квалификации работников.

Зарубежные исследования подтверждают важность карьерного развития и качества трудовой жизни как мощных факторов мотивации и удовлетворённости работников. Так, H. Pillay, Q. Dawood и A. Karodia (2015), анализируя южноафриканский нефтеперерабатывающий завод, выявили, что карьерное продвижение и доступ к обучению – ключевые факторы мотивации работников. Исследование показало, что отсутствие прозрачных карьерных траекторий снижает вовлеченность и увеличивает текучесть кадров, тогда как инвестиции в обучение укрепляют трудовую дисциплину и повышают удовлетворённость. Схожие выводы представляют M. Hammond, N. O. Owusu, E. K. Nunoo и др. (2023), исследовавшие влияние качества трудовой жизни на удовлетворённость персонала газоперерабатывающего завода в Гане. Авторы подтверждают статистически значимую связь между удовлетворённостью трудовой жизнью и такими факторами, как эмоциональное благополучие, баланс работа–жизнь, личностное развитие и безопасная среда. Эмоциональное благополучие оказалось наиболее сильным предиктором удовлетворённости, что ещё раз подтверждает значимость нематериальных факторов.

С точки зрения казахстанской специфики, значительный вклад в понимание кадрового развития нефтегазовых компаний внесли М. А. Мансурова, А. Д. Махмудов и Л. В. Федорченко (2020), исследовавшие систему обучения и развития персонала компании «Карачаганак Петролеум Оперейтинг Б.В.». Авторы подчёркивают, что эффективное обучение непосредственно влияет на мотивацию через повышение профессиональной уверенности, возможность карьерного роста и участие в международных программах. Системность обучения, наличие дуального образования, формирование национального кадрового резерва – всё это формирует условия для роста мотивации персонала на долгосрочном уровне. Интересный вклад в изучение мотивационных факторов в Казахстане внесла Г. С. Bilashova (2022), проведшая исследование удовлетворенности работой сотрудников компании Maersk Oil в Казахстане. Исследование показало, что значимыми факторами удержания работников и повышения их мотивации являются организационная поддержка, признание заслуг, справедливая система вознаграждения и возможности

профессионального роста. Особое внимание автор уделяет тому, что уровень управления персоналом в Казахстане отстаёт от мировых практик, что повышает ценность адаптации современных мотивационных моделей.

Обобщение рассмотренных теоретических и эмпирических исследований позволяет сформировать ключевую гипотезу: эффективность мотивации персонала на предприятиях нефтеперерабатывающего комплекса напрямую зависит от интеграции материальных и нематериальных стимулов, включающих развитие корпоративной культуры, повышение организационной сопричастности, обеспечение возможностей профессионального роста и формирование высокого качества трудовой жизни; при этом наибольшее влияние на мотивацию оказывают нематериальные факторы, связанные с эмоциональным благополучием, обучением и карьерным развитием.

III. Методология исследования (и инструменты сбора данных)

Методологическая основа исследования обусловлена необходимостью комплексного анализа современных подходов к мотивации персонала в нефтеперерабатывающем секторе, а также выявления отраслевой специфики формирования мотивационных моделей на примере конкретной компании. В рамках статьи применяется сочетание теоретических и эмпирических методов. Теоретический компонент исследования основан на систематизации научных источников, включающих работы российских, казахстанских и зарубежных авторов, посвящённые вопросам построения систем мотивации и стимулирования персонала в нефтегазовой отрасли. Эмпирическая часть исследования основана на анализе официальных годовых и социальных отчётов Компании с Ограниченной Ответственностью «Аджип Карачаганак Б.В.» (Agip/Eni), являющейся одним из ключевых операторов крупнейшего в мире газоконденсатного месторождения Карачаганак. Данный выбор обусловлен тем, что структура управления персоналом, корпоративная культура, система мотивации и социальная политика этой компании отражают типичные особенности нефтеперерабатывающей отрасли Казахстана, а также демонстрируют уровень соответствия международным отраслевым стандартам.

В рамках исследования были использованы следующие методы:

– контент-анализ отчетов компании, включающих корпоративные программы по обучению и развитию, систему вознаграждения, социальные инициативы, меры по обеспечению безопасности и внутренние коммуникации;

– структурно-функциональный анализ, направленный на выявление элементов мотивационной системы и их взаимосвязи;

– метод качественной интерпретации, применяемый для определения специфических характеристик мотивации персонала в условиях высокотехнологичного, капиталоёмкого и экологически чувствительного производства.

Использование отчетов компании в качестве эмпирической базы позволяет установить реальные, а не теоретически предполагаемые особенности мотивации персонала, оценить практическую эффективность инструментов стимулирования.

IV. Результаты

Для подтверждения гипотезы данного исследования был проведен анализ системы мотивации компании «Аджип Карачаганак Б.В.», которая представляет собой новый современный производственный комплекс, входящий в число ведущих нефтеперерабатывающих заводов страны и располагается в промышленной зоне одного из наиболее экономически перспективных областных центров Казахстана – городе Актобе. Вся производимая продукция сертифицирована в государственной системе технического регулирования Республики Казахстан (agipkaragachanakbv.kz, 2025).

На основе анализа ESG-отчётов компании выявлено, что система мотивации компании «Аджип Карачаганак Б.В.» выстроена в соответствии с международными стандартами управления персоналом и адаптирована к особенностям высокотехнологичной, опасной и капиталоёмкой нефтеперерабатывающей отрасли. Прежде всего, необходимо отметить, что мотивационная система компании «Аджип Карачаганак Б.В.» интегрирована в корпоративную стратегию «КПО 365», определяющую ключевые направления развития персонала: безопасность, вовлечённость, национализация кадров, развитие компетенций, поддержание многообразия и равных возможностей (kpo.kz, 2025). Для компании «Аджип Карачаганак Б.В.» это означает, что HR-политика не ограничивается материальными стимулами, а строится вокруг ценностей устойчивого развития, этических норм и долгосрочных социальных обязательств.

Миссия и стратегические цели компании подчёркивают приоритет заботы о сотрудниках, что формирует основу для нематериальных аспектов мотивации – доверия, сопричастности, стабильности и предсказуемости карьерного развития. Такая концептуальная рамка является ключевой особенностью мотивации в компании «Аджип Карачаганак Б.В.», где работа каждого сотрудника тесно связана с рисками эксплуатации опасного производственного объекта.

Система материального вознаграждения в компании «Аджип Карачаганак Б.В.» является одной из наиболее привлекательных в отрасли, что подтверждается стабильным уровнем занятости и высокой лояльностью персонала. Основные элементы включают:

– конкурентные уровни заработной платы, сопоставимые с международными компаниями нефтегазового сектора;

– ежегодные бонусы, привязанные к результатам компании и индивидуальному вкладу сотрудника;

– расширенный социальный пакет, включающий медицинское страхование, жильё, транспорт, питание и другие формы поддержки;

– дополнительные выплаты за работу в условиях повышенной опасности, вахтовый метод, ночные смены и участие в проектах по реконструкции и модернизации установок.

Всем работникам, имеющим трудовой договор с Компанией, предоставляется пакет льгот, состоящий из денежных выплат и неденежных льгот. Большая часть льгот

предусмотрена коллективным договором. В соответствии с условиями коллективного договора КПО выплачивает премию ко Дню работника нефтегазового комплекса, премию в конце года, премию к годовщине подписания ОСРП, а также материальную помощь для восстановления здоровья. Размер данных выплат также зависит от персонального грейда работника. Персонал компании «Аджип Карачаганак Б.В.» получает доступ к программам материальной поддержки, связанным с обучением детей, льготными условиями кредитования и корпоративными компенсациями.

Особенностью компании «Аджип Карачаганак Б.В.» является то, что безопасность труда выступает не только обязательством, но и одной из центральных форм нематериальной мотивации. Так, к примеру, в 2024 году компания реализовала масштабные инициативы в области охраны труда и здоровья: комплексная система обучения и ежегодной сертификации работников по ТБ; регулярные тренировки по готовности к ЧС; внедрение цифровых систем мониторинга опасных факторов; программы по снижению травматизма «Ноль происшествий». Для сотрудников участие в таких инициативах не только повышает личную безопасность, но и формирует чувство стабильности и защищённости, что является важным элементом мотивации в условиях опасного производства. Кроме того, компания «Аджип Карачаганак Б.В.» уделяет особое внимание психологическому благополучию сотрудников. В компании созданы программы поддержки, консультации специалистов, механизмы раннего выявления эмоциональных перегрузок, что особенно актуально в условиях высокой производственной ответственности.

Обучение и развитие сотрудников входит в топ-приоритетов компании. Для компании «Аджип Карачаганак Б.В.» это выражается в многоуровневой системе профессионального роста, включающей: внутренние тренинги и техническое обучение; международные сертификационные программы; стажировки в зарубежных филиалах материнских компаний («Эни», «Шелл», «Шеврон»); дуальные программы подготовки молодых специалистов; инициатива развития национального кадрового резерва. Динамика количества обученных работников компании в рамках международных сертифицированных программ за 2021-2024 гг. приведена в таблице 1.

Таблица 1 - Динамика количества обученных работников компании в рамках международных сертифицированных программ за 2021-2024 гг.

Название программы	2021	2022	2023	2024
Управление скважиной / Контроль давления в скважине при газонефтеводопроявления (IWCF)	61	46	59	22
Сертификация по неразрушающему контролю (NDT)	13	20	50	30
Международный диплом института CIPS в области закупок и поставок по базовому курсу	13	19	19	43
Курс по аварийному реагированию на чрезвычайные ситуации MEMIR по стандарту OPITO	17	17	11	8
Международный сертификат в области охраны здоровья,	9		12	17

окружающей среды и техники безопасности (NEBOSH)				
Дипломированный внутренний аудитор (CIA)			4	2
Сертификация по международной финансовой отчетности ACCA	2		3	1
Магистр делового администрирования	1	1	6	4
Сертификация по техническим стандартам API	10	9	8	12
Сертификация по курсу «Профессиональное управление проектом» (PMP) ®	1		13	
Международный сертификат IEMA в области экологического менеджмента	1	1		2
Инспектор завода по стандартам ASME		23	17	17
Коучинг в организации и бизнесе (ICF)			12	8
Международный сертификат по безопасной организации работ (IOSH)				10
Сертифицированный специалист по международным закупкам (CIPP)				3
Общее количество сотрудников, прошедших программы сертифицированного обучения	128	136	214	179

Такой подход обеспечивает высокую квалификацию персонала и формирует уверенность сотрудников в карьерных перспективах. Помимо этого, возможность горизонтальной мобильности между подразделениями КПО и участие в крупных проектах модернизации также являются значимыми мотивирующими факторами.

В 2024 году компания организовала многочисленные корпоративные мероприятия, программы признания заслуг, ежегодные церемонии награждения работников и подрядчиков. Эти инструменты являются важной частью нематериальной мотивации, укрепляя чувство принадлежности к компании. В частности, регулярные встречи с HR и руководством; информационная поддержка через корпоративный журнал, интранет-портал, электронные дисплеи; мероприятия, посвящённые профессиональным праздникам; цифровые опросы работников по ключевым аспектам работы. Акцент на диалоге и обратной связи позволяет руководству учитывать реальные потребности персонала и адаптировать мотивационные механизмы.

Эффективность системы мотивации персонала подтверждается достаточно низкими показателями текучести (рисунок 1).

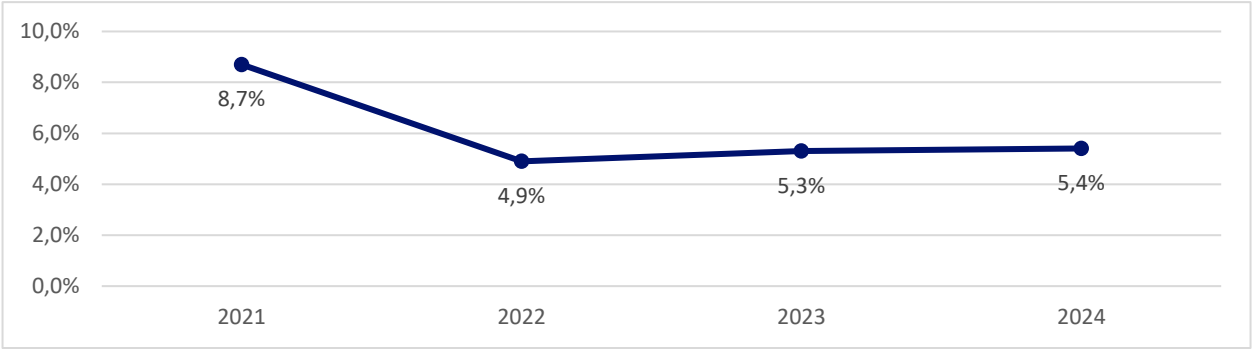


Рисунок 1 - Показатели текучести кадров (наемного персонала) компании, 2021–2024 гг., в процентах

В целом, проведённый анализ демонстрирует, что система мотивации персонала компании «Аджип Карачаганак Б.В.» является комплексной и ориентированной на долгосрочное развитие человеческих ресурсов. Её ключевые особенности включают: высокий уровень материального вознаграждения; гибкую систему социальной поддержки; стратегический акцент на безопасности труда; развитую инфраструктуру профессионального роста; продвижение корпоративных ценностей; постоянный диалог с персоналом; акцент на психологическое благополучие и вовлечённость. Эта система отвечает современным требованиям нефтеперерабатывающей отрасли и соответствует лучшим международным практикам, что позволяет компании «Аджип Карачаганак Б.В.» удерживать высококвалифицированных специалистов и поддерживать устойчивое развитие компании.

V. Общее обсуждение

Проведённое исследование позволило выявить ключевые тенденции и закономерности формирования мотивационных стратегий в отрасли, характеризующейся высоким уровнем технологической сложности, повышенными рисками и строгими требованиями к квалификации работников. Анализ научной литературы показал, что мотивация в нефтегазовом секторе формируется под влиянием сочетания материальных, нематериальных, культурных и профессионально-ориентированных факторов. Особую роль играют корпоративная культура, организационная сопричастность, карьерное развитие, качество трудовой жизни и эмоциональное благополучие работников. Эмпирическая часть исследования – анализ системы мотивации персонала Компании с ограниченной ответственностью «Аджип Карачаганак Б.В.» – продемонстрировала, что в реальной практике современные компании используют интегрированные модели мотивации, включающие конкурентную оплату труда, расширенные социальные пакеты, инструменты безопасности, программы обучения, элементы культуры признания, диалог с персоналом и корпоративную социальную ответственность. Специфика нефтеперерабатывающего производства усиливает роль нематериальных факторов, прежде всего безопасности,

эмоциональной устойчивости, квалификационного роста и доверия к корпоративной политике.

Теоретический вклад исследования заключается в уточнении роли нематериальных стимулов в условиях высокорисковой и капиталоёмкой отрасли. В отличие от классических мотивационных моделей, где приоритет принадлежит материальному вознаграждению и условиям труда, результаты настоящей работы демонстрируют, что в нефтегазовом секторе «высшие» потребности, связанные с чувством сопричастности, уверенностью в будущем, возможностью профессионального роста и качественным взаимодействием с организацией, оказывают более сильное влияние на трудовое поведение сотрудников. Таким образом, мотивация работников в нефтегазовой отрасли приобретает многомерный характер, что требует переосмысления традиционных теоретических подходов и обоснования интегративных моделей мотивации, объединяющих экономические, социально-психологические и культурные компоненты.

Практическое значение работы состоит в том, что выявленные закономерности и особенности мотивации могут служить основанием для совершенствования корпоративных HR-практик. На примере компании «Аджип Карачаганак Б.В.» становится очевидно, что наиболее эффективной является такая система мотивации, которая не только обеспечивает конкурентную компенсацию и качественные условия труда, но и формирует культуру безопасности, поддерживает профессиональное развитие, укрепляет эмоциональное благополучие сотрудников и обеспечивает их устойчивую вовлечённость. Для компаний нефтеперерабатывающего комплекса важным представляется развитие систем внутреннего обучения и наставничества, расширение программ поддержки персонала, формирование механизмов признания достижений, повышение прозрачности корпоративных коммуникаций и укрепление корпоративной идентичности. В бизнес-практике такие меры способствуют снижению текучести, повышению дисциплины, росту производственной эффективности и формированию устойчивой корпоративной среды.

В целом работа подчёркивает, что эффективная мотивация персонала в нефтеперерабатывающей отрасли должна рассматриваться как многокомпонентная система, основанная на сочетании экономических стимулов, корпоративных ценностей, развития компетенций и психологического благополучия. Современные тенденции свидетельствуют о растущей значимости нематериальных факторов мотивации, что открывает новые направления для дальнейших теоретических разработок и совершенствования управленческих практик.

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Artificial Intelligence Adoption among Micro and Small Enterprises in Kazakhstan

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The diffusion of Artificial Intelligence (AI) technologies among micro and small enterprises (MSEs) has emerged as a critical component of digital transformation, productivity enhancement, and competitiveness in developing and transition economies. While existing literature provides substantial evidence on technology adoption in large firms, it also identifies that firms in Kazakhstan struggle to identify the most effective applications of AI solutions. There remains a significant empirical gap regarding the patterns, drivers, and constraints of AI uptake among MSEs, particularly in Central Asia. This study addresses this gap by examining the current landscape of AI use and the underlying individual and institutional factors influencing adoption among MSEs in Kazakhstan.

The study addresses two core questions:

1. What is the current landscape of AI use among MSEs in Kazakhstan?

2. What individual and institutional factors shape the adoption of AI technologies among these firms?

The study is guided by an integrated conceptual framework drawing on the Unified Theory of Acceptance and Use of Technology model framework, which enables a structured analysis of individual-level characteristics such as performance and effort expectancy, as well as institutional environments, jointly shaping technology adoption decisions.

Methodologically, the pilot study employs a qualitative research design based on semi-structured interviews with owners and managers of MSEs across retail and service sectors. The interview instrument was designed to capture (i) firm characteristics (industry, size, and years of operation); (ii) the adoption and application of AI-based technologies; and (iii) perceived barriers and enablers of AI adoption, including individual attitudes and institutional support mechanisms.

The data analysis followed a thematic analysis for an in-depth exploration of both observable adoption patterns and underlying behavioral and institutional drivers.

Preliminary findings suggest that AI adoption among MSEs in Kazakhstan remains at an early stage, with most firms relying primarily on basic digital tools rather than advanced AI

applications. AI use among MSEs remains limited and largely on easily accessible applications, particularly in marketing automation and customer engagement. Rather than fundamentally transforming business models, AI is primarily used to optimize existing processes, suggesting an incremental rather than transformative adoption.

At the individual level, adoption decisions are strongly influenced by the cost of use, digital literacy, perceived usefulness of AI technologies, and risk tolerance. Many respondents expressed interest in AI but reported limited technical knowledge and uncertainty regarding implementation costs and returns, which constrains adoption. Behavioral factors such as lack of trust in the accuracy of information and data privacy, as well as the need to retain the client's trust and relationship, arise as factors leading to adoption hesitancy. The most referenced constraint being lack of confidence in using advanced technologies.

Despite limited adoption, firms report tangible benefits in terms of time savings and improved customer interaction. These gains indicate that even basic AI tools can contribute to sustainable value creation, particularly by enhancing operational resilience and resource efficiency.

At the institutional level, while policy initiatives aimed at digitalization exist, their visibility, accessibility, and practical relevance to MSEs remain limited. While some respondents acknowledged the existence of initiatives aimed at supporting AI use, most respondents reported low awareness of support programs and limited engagement with institutional actors, indicating a disconnect between policy design and firm-level realities.

The study contributes to the technology adoption in business literature in two key ways. First, it provides context-specific empirical evidence on AI adoption in a relatively under-researched region. Second, it highlights the importance of non-technical barriers, particularly managerial perceptions and institutional awareness, in shaping adoption outcomes.

From a policy perspective, the findings underscore the need for integrated digitalization strategies that align technological infrastructure, human capital development, and institutional support. Enhancing the visibility and usability of support programs, alongside fostering digital skills among entrepreneurs, will be critical to accelerating AI adoption and ensuring inclusive digital transformation.

An Ecofeminist Critique of Environmental Governance in Kazakhstan Since 2019

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Chapter 1. Introduction

Environmental policy is often described as a matter of regulation, targets, and technical solutions. It promises efficiency, control, and measurable progress. Yet this way of thinking quietly assumes that environmental problems affect everyone in the same way. In reality, they do not. Environmental risks are lived differently, shaped by everyday responsibilities, access to resources, and social roles that remain largely invisible in policy discussions.

In Kazakhstan, this tension has become more visible in recent years. Since the first term of President Tokayev, the country has introduced a series of environmental reforms, including the adoption of the Environmental Code of the Republic of Kazakhstan and the development of long-term climate strategies aligned with international commitments under the UNFCCC. These changes signal an effort to modernize environmental governance and position Kazakhstan within global sustainability agendas. At the same time, they continue to frame environmental governance primarily as a technical and administrative task.

This raises a broader concern. When environmental governance is reduced to technical management, important social questions tend to disappear. Who is affected most by environmental risks? Whose knowledge is recognized in decision-making? And who remains unheard? While these questions have been explored in international research, they remain largely absent in discussions of environmental governance in Kazakhstan.

This paper builds on the existing literature but shifts the focus. Instead of treating environmental governance as a neutral system of policies and institutions, it approaches it as a field shaped by power relations and social differences. Drawing on ecofeminism and feminist political ecology, the study asks whether the apparent neutrality of environmental governance masks deeper forms of exclusion.

The central research question guiding this paper is: why does environmental governance in Kazakhstan remain gender-blind despite recent policy reforms? To address this question, the study analyzes environmental policy documents adopted since 2019, focusing on how environmental problems are framed and what is left unspoken within official discourse.

By doing so, the paper does not aim to provide a comprehensive evaluation of policy effectiveness. Instead, it seeks to offer a different perspective—one that highlights how environmental governance is constructed, whose experiences it reflects, and whose views it overlooks. In this sense, the study contributes to a more critical and socially grounded understanding of environmental governance in Kazakhstan.

Chapter 2. Literature Review

2.1. Environmental Governance in Kazakhstan since 2019

In recent years, academic attention to environmental governance in Kazakhstan has increased. This is closely linked to a series of reforms introduced after 2019, as well as to growing public concern about pollution, climate change, and environmental safety. Most studies, however, still approach environmental governance from a rather narrow angle. They focus on institutions, legal frameworks, and administrative capacity, and tend to evaluate governance in terms of efficiency, coordination, and compliance with international standards (Nugumanova & Frey, 2017).

Within this body of literature, environmental governance is usually described as a state-driven process. Scholars pay close attention to laws, permits, and policy instruments, while broader political and social dynamics receive less discussion. Power relations, conflicts of interest, and questions of inequality are often treated as secondary issues rather than as central features of governance itself.

The adoption of the Environmental Code in 2021 is commonly presented as a key moment in Kazakhstan's environmental policy development. The Code is described as an attempt to systematize environmental regulation and modernize environmental management practices (Government of Kazakhstan, 2021). Around the same period, climate policy became more visible through updated Nationally Determined Contributions, which outline Kazakhstan's commitments under the global climate framework (UNFCCC, 2025). The Strategy for Achieving Carbon Neutrality by 2060 further reinforces this direction by setting long-term targets and identifying priority sectors for emission reduction (UNFCCC, 2024).

These documents present environmental governance mainly as a technical task. Emphasis is placed on targets, indicators, and institutional coordination. Social questions are largely absent from this framing. As Poberezhskaya (2022) points out, environmental governance in Kazakhstan remains deeply embedded in an extractive economic model and centralized political system. These structural conditions shape not only how policies are designed, but also how they are implemented. While official discourse increasingly refers to sustainability and green development, economic stability and industrial interests continue to dominate policy priorities. As a result, environmental governance is often discussed as a managerial challenge rather than as a political process with uneven social consequences.

2.2. Environmental Activism, Participation, and Governance Struggles

A different perspective on environmental governance emerges from studies on civic participation and environmental activism. This literature documents a noticeable increase in environmental protests and local initiatives across Kazakhstan, particularly in response to industrial

pollution, waste management problems, and health risks. At the same time, researchers consistently emphasize the limits of civic influence within the existing political system (Sari, 2023).

Although participation is formally included in environmental decision-making procedures, its practical impact remains restricted. Environmental activism operates in a space where public engagement is allowed, but carefully controlled. Dialogue with authorities does take place, yet it is shaped by bureaucratic rules and institutional boundaries. In many cases, environmental conflicts are handled through administrative mechanisms that frame them as technical problems rather than as issues of responsibility or justice (Kopack, 2025).

This way of managing environmental conflict reduces the scope for public debate. It also limits the ability of affected communities to challenge official priorities. As a result, environmental governance appears less as an open arena for negotiation and more as a managed process in which certain voices carry more weight than others.

What is largely missing from this literature is a gender perspective. Participation is usually discussed in general terms, without asking who participates and under what conditions. Gendered expectations, care responsibilities, and everyday constraints are rarely considered. This absence is striking given the visible role of women in local environmental initiatives and community responses to environmental risks.

2.3. Gender and Environment in Kazakhstan and Central Asia

Academic research that directly links gender and environmental governance in Kazakhstan remains limited. National policy documents do refer to gender equality, including the Concept of Family and Gender Policy until 2030, yet these policies are rarely connected to environmental governance in scholarly analysis (Government of Kazakhstan, 2016). Gender tends to appear as a separate issue rather than as a factor shaping environmental decision-making.

Some attention to gender can be found in reports produced by international organizations. UNDP highlights women's involvement in renewable energy projects and community-based environmental management (UNDP, 2023). UN Women draws attention to women's underrepresentation in leadership positions related to climate and environmental policy (UN Women, 2024). While these reports are informative, they mostly remain within the sphere of development practice and do not engage deeply with academic debates on governance.

One of the few academic studies that addresses this gap is the work by Kovaleva and colleagues, who show that gender remains marginal in climate change research across Central Asia (Kovaleva et al., 2023). Gender is often mentioned, but rarely analyzed in a systematic or theoretical way. In Kazakhstan, studies of environmental governance continue to prioritize institutions and policies, leaving everyday experiences and social differences largely unexplored.

Quantitative research does point to gender differences in environmental behavior. For example, studies on household waste sorting show that gender can influence everyday environmental practices (Zhidebekkyzy et al., 2023). However, this type of research treats gender

mainly as a measurable characteristic. It does not examine how environmental governance itself is shaped by gendered power relations, norms, and expectations.

2.4. Ecofeminism as a Critical Theoretical Framework

Ecofeminism offers a way to think about environmental problems that goes beyond technical explanations. At its core, it connects environmental degradation with unequal power relations between women and men. The term was first introduced by Françoise d'Eaubonne in the 1970s. She argued that the ecological crisis and the oppression of women are not separate issues, but instead emerge from the same patriarchal and extractive social systems (d'Eaubonne, 1974). Over time, ecofeminism has grown into a broad and diverse field that includes philosophical, political, and materialist perspectives.

Many ecofeminist scholars question the assumptions that shape dominant models of development and governance. They point out that these models rely on sharp divisions, such as nature versus culture or rationality versus care. These divisions often place higher value on what is associated with control, production, and technical expertise, while devaluing activities linked to care and social reproduction, which are commonly associated with women (Plumwood, 1993). Karen Warren further explains that these hierarchies influence whose knowledge is treated as legitimate and whose contributions remain invisible in political and institutional decision-making (Warren, 2000). From this point of view, environmental governance is never neutral. It reflects social choices about whose voices matter and whose labor sustains ecological and social systems.

Materialist ecofeminist thinkers focus more directly on political economy. Maria Mies and Vandana Shiva show how women's unpaid labor often absorbs the hidden costs of environmental degradation, especially in economies built on resource extraction (Mies & Shiva, 1993). Ariel Salleh expands this argument by highlighting how care work and social reproduction are systematically overlooked in dominant economic and governance models (Salleh, 2017). These ideas are particularly relevant in the context of Kazakhstan, where pollution, water shortages, and energy insecurity frequently increase women's responsibilities within households and communities.

Despite its relevance, ecofeminism has rarely been used to study environmental governance in post-Soviet countries. Centralized political systems and resource-dependent economies, such as Kazakhstan's, remain largely absent from ecofeminist analysis. This gap limits our understanding of how gendered power relations shape environmental governance in these contexts and why women's experiences often remain excluded from policy debates.

2.5. Feminist Political Ecology and Feminist Climate Governance

Feminist political ecology helps explain how environmental governance works in practice by paying attention to power relations and everyday life. Instead of focusing only on laws and institutions, this approach looks at how environmental decisions affect people differently depending on their social position. Early work in this field highlights the importance of local

knowledge and daily experience in understanding environmental problems (Rocheleau et al., 1996).

Later studies stress that women should not be treated as a single or uniform group. Gender is shaped by social roles, economic conditions, and institutional structures, and it intersects with factors such as class and place (Nightingale, 2006). This perspective is useful for Kazakhstan, where environmental risks and access to decision-making differ significantly between regions and social groups.

Feminist research on climate governance shows that policies presented as gender-neutral often overlook social needs. When climate strategies focus mainly on technical solutions, they tend to ignore care work and everyday responsibilities (Gonda, 2019). In the case of Kazakhstan, this approach helps reveal why climate policies may fail to address the social and gendered impacts of environmental change.

2.6. Synthesis and Research Gap

Much of the existing literature treats environmental governance in Kazakhstan as a question of policy design and institutional reform. While these studies provide useful descriptions of laws and strategies, they rarely examine how environmental decisions are connected to power, inequality, or everyday experience. Gender is mentioned only occasionally and usually without deeper analysis. In Central Asia more broadly, academic work that links gender to environmental governance remains limited, even though policy documents increasingly acknowledge gender issues.

Another gap concerns theory. Ecofeminist and feminist political ecology approaches are almost never used to study environmental governance in post-Soviet, resource-dependent states. As a result, little is known about how gendered power relations shape environmental policy and participation in centralized governance systems such as Kazakhstan's.

This study addresses these gaps by examining environmental governance in Kazakhstan since 2019 through an ecofeminist lens. Using document analysis and qualitative interviews, it focuses on how women interpret environmental policies, how they experience environmental risks, and how gender influences access to decision-making. By centering women's perspectives, the study offers a different way of understanding environmental governance and extends ecofeminist analysis to the Central Asian context.

Chapter 3. Research Gap and Problem Statement

3.1. Research Gap

The literature reviewed in the previous chapter demonstrates that environmental governance in Kazakhstan has been actively studied in recent years, particularly in relation to legal reforms, climate policy development, and institutional modernization. Scholars have paid close attention to the adoption of the Environmental Code, the evolution of climate commitments, and Kazakhstan's

alignment with international environmental frameworks (Poberezhskaya, 2022). These studies provide valuable insights into how environmental governance is formally designed and implemented at the state level.

At the same time, this body of research reveals a significant limitation. Environmental governance is predominantly analyzed as a technical and administrative process, with a strong emphasis on regulatory instruments, institutional capacity, and policy efficiency. Social relations, power asymmetries, and lived experience remain largely outside the analytical focus. As a result, environmental governance is often treated as politically neutral, even though environmental decisions have uneven social consequences and affect different groups in different ways.

One of the most striking gaps concerns gender. Despite the growing visibility of gender equality in international climate discourse and development practice, gender remains marginal in academic research on environmental governance in Kazakhstan. Existing studies rarely examine how environmental policies are experienced by women, how gendered responsibilities shape responses to environmental risks, or how access to environmental decision-making is structured along gender lines (Kovaleva et al., 2023). When gender does appear, it is often treated as a background characteristic rather than as a central analytical dimension.

This gap is particularly evident when comparing academic research with policy and development reports. International organizations working in Kazakhstan increasingly highlight women's roles in community-level environmental management and renewable energy initiatives, while also pointing to women's underrepresentation in leadership and governance structures (UNDP, 2023; UN Women, 2024). However, these insights remain largely disconnected from scholarly analyses of environmental governance. As a result, there is a disconnect between what is acknowledged in policy-oriented discussions and what is systematically studied in academic research.

Another important gap concerns theory. Ecofeminism and feminist political ecology offer well-developed frameworks for analyzing the relationship between environmental degradation, gendered power relations, and governance. These approaches emphasize that environmental problems cannot be separated from social hierarchies, care work, and unequal access to authority and knowledge (Warren, 2000). Yet, these theoretical perspectives have rarely been applied to post-Soviet and resource-dependent contexts such as Kazakhstan. As a result, existing ecofeminist scholarship remains geographically and politically uneven, while studies of Kazakhstan's environmental governance lack a critical gender-sensitive lens.

Taken together, these gaps point to a broader absence in the literature: there is little research that examines environmental governance in Kazakhstan as a gendered and power-laden process, informed by ecofeminist theory and grounded in women's lived experiences. This absence limits our understanding of how environmental policies are interpreted, contested, and reproduced in everyday life.

3.2. Problem Statement

The absence of a gender-sensitive and ecofeminist perspective in the study of environmental governance in Kazakhstan has important implications for both research and policy. When environmental governance is approached primarily as a technical and institutional challenge, critical questions about social inequality, care responsibilities, and participation remain unaddressed. This creates an incomplete picture of how environmental governance actually functions and whom it serves.

Since 2019, Kazakhstan has presented itself as a country moving toward greener development and stronger environmental regulation. Yet, without examining how these policies are experienced on the ground, it is difficult to assess their social relevance and inclusiveness. Women often play a central role in managing household resources, responding to environmental risks, and participating in local environmental initiatives. Ignoring these experiences means overlooking a key dimension of environmental governance and missing opportunities to understand its social effects more fully.

From a theoretical perspective, the lack of ecofeminist analysis reinforces the idea that environmental governance can be gender-neutral. Ecofeminist scholars have long argued that such neutrality is misleading, as governance structures tend to privilege certain forms of knowledge, authority, and labor while marginalizing others (Plumwood, 1993). Applying ecofeminist and feminist political ecology perspectives to Kazakhstan allows for a critical rethinking of environmental governance as a field shaped by power relations, rather than as a purely managerial system.

Empirically, this study addresses the problem that women's voices remain underrepresented in analyses of environmental governance in Kazakhstan. By focusing on women's interpretations of environmental policy, their experiences of environmental risk, and their access to decision-making processes, the research seeks to uncover dimensions of governance that are currently overlooked. This is particularly important in a centralized political system, where formal participation mechanisms exist but meaningful influence is unevenly distributed.

Addressing this problem is necessary not only to advance academic knowledge, but also to inform more inclusive approaches to environmental governance. Without understanding how environmental policies interact with gendered realities, governance reforms risk reproducing existing inequalities rather than addressing them. This study therefore positions itself at the intersection of environmental governance research and feminist theory, aiming to contribute both empirically and conceptually to debates on sustainability, gender, and power in Kazakhstan.

Chapter. 4. Methodology

4.1 Research Design

This study is based on a qualitative research design and follows an interpretive approach. Instead of trying to measure variables or test clear causal relationships, the research focuses on how environmental governance is actually constructed through policy language, institutional logic, and the way problems are framed. The aim is not to assess whether environmental policy in Kazakhstan

is effective or not, but to understand how it is presented and what kinds of perspectives are included or left out in this process.

An interpretive approach is useful here because it allows the analysis to go beyond what is explicitly written in policy documents and to pay attention to meaning, tone, and underlying assumptions. Environmental governance is treated not as a neutral system of rules, but as something shaped by social and political contexts. This is important because policies often appear objective, while in practice they reflect specific priorities and ways of thinking. Drawing on ecofeminism and feminist political ecology, this study approaches governance as a field where power relations matter, including those related to gender, even when they are not openly discussed.

Focusing on discourse rather than outcomes makes it possible to notice patterns that are usually overlooked. In particular, it helps to question the idea that environmental policy is neutral and to explore how certain topics, such as gender, can remain invisible without being explicitly excluded.

4.2 Data and Case Selection

The analysis is based on a set of official environmental and climate policy documents adopted in Kazakhstan between 2019 and 2024. This period was chosen because it reflects a time when environmental governance became more visible in the country, with new reforms, updated legislation, and stronger engagement with international climate commitments.

The main document examined is the Environmental Code adopted in 2021, which serves as the central legal framework for environmental regulation. In addition to this, the study includes national climate policy documents, such as the Strategy for Achieving Carbon Neutrality by 2060 and the updated Nationally Determined Contributions. These are complemented by official reports and materials produced by state institutions and international organizations working in Kazakhstan, including UNDP and UN Women.

These documents were selected because they represent the official narrative of environmental governance. They show how environmental problems are defined at the national level, what kinds of solutions are prioritized, and which actors are recognized as relevant. By focusing on these texts, the study examines governance at the point where decisions are formalized and justified. This also makes it possible to look not only at what policies aim to do, but at how they describe reality and structure the way environmental issues are understood.

4.3 Method of Analysis

The study uses qualitative content analysis with elements of discourse analysis. Rather than simply identifying keywords or counting how often certain terms appear, the analysis focuses on how environmental governance is framed and what kinds of assumptions are embedded in policy

language. Particular attention is given not only to what is present in the documents, but also to what is missing.

The analysis began with a close reading of all selected documents in order to identify recurring themes and general patterns. During this stage, it became clear that environmental governance is consistently described through technical terms, with a strong focus on regulation, indicators, and institutional coordination. Environmental problems are framed in ways that emphasize management and control, while social aspects receive little attention.

The next step involved a more detailed examination of language. This included looking at how environmental issues are described, whether social differences are acknowledged, and how responsibility is distributed between different actors. The analysis specifically searched for references to gender, women, or inequality. The fact that such references are largely absent is treated here as meaningful, rather than accidental. Absence itself becomes part of the analysis, as it reflects what is not considered relevant within policy discourse.

Finally, the identified patterns were interpreted through the lens of ecofeminism and feminist political ecology. These frameworks make it possible to connect the observed absence of gender with broader questions of power and knowledge. For example, the dominance of technical language can be understood as privileging certain types of expertise, while excluding others that are based on everyday experience. In the same way, the lack of attention to gender points to a broader tendency to overlook social differences in environmental governance.

Throughout the analysis, the focus remains on identifying consistent patterns across documents rather than isolated examples. The goal is to show how environmental governance is shaped at a structural level, not to evaluate individual policies separately.

4.4 Scope and Limitations

This study is based entirely on document analysis and does not include interviews or fieldwork at this stage. This means that it does not directly capture how environmental policies are experienced by different groups in practice. Instead, the research focuses on how environmental governance is presented at the official level, where policies are defined and communicated.

This can be seen as both a limitation and a deliberate choice. On the one hand, the absence of interviews means that the study cannot fully explore lived experiences or local perspectives. On the other hand, analyzing policy documents makes it possible to examine how environmental governance is framed from the top, which is often where certain perspectives are excluded from the outset. In this sense, the study focuses on the level at which categories, priorities, and forms of knowledge are established.

Future research could expand this approach by including interviews with women involved in environmental activism, community initiatives, or local governance. This would provide a more detailed understanding of how policies are interpreted and negotiated in everyday life. At the same

time, even without this additional data, the current approach allows for a clear analysis of how environmental governance is constructed and what kinds of perspectives it leaves out.

Chapter 5. Analysis: Gendered Absences in Environmental Governance

This section explores how environmental governance in Kazakhstan is constructed through official policy documents and what this construction reveals about the role of gender. The analysis focuses on the Environmental Code (Government of Kazakhstan, 2021), climate strategies, and related policy materials. It pays attention not only to what is included in these documents, but also to what is left unspoken.

5.1 What the Law Says and What It Does Not Say

A close reading of the Environmental Code shows that it is written in a highly formal and technical language. The document defines environmental protection in terms of standards, permits, emissions, and compliance procedures. It sets out responsibilities for state bodies, businesses, and regulatory institutions. It also introduces mechanisms such as environmental impact assessment, monitoring systems, and liability for violations.

What is noticeable is not only what the Code contains, but also what it does not contain. There is no reference to gender as a relevant category in environmental governance. The law does not mention differences in how environmental harm may affect different groups. It does not consider how responsibilities for dealing with environmental risks may be distributed within households or communities. It does not recognize women as a distinct group of stakeholders.

This absence is important because laws do more than regulate behavior. They define what counts as a problem. When gender is not included in the legal framework, it is effectively treated as irrelevant to environmental governance. This creates a situation where policies are designed without considering how they interact with existing social inequalities.

In contrast, Kazakhstan does have a national framework that addresses gender equality. The Concept of Family and Gender Policy until 2030 (Government of Kazakhstan, 2016) outlines goals related to equal participation, social protection, and access to opportunities. However, this framework operates separately from environmental policy. There is no clear connection between gender policy and environmental governance. As a result, gender equality remains a formal commitment rather than a practical element of environmental decision-making.

5.2 Environmental Governance as a Technical System

Environmental governance in Kazakhstan is built around the idea that environmental problems can be managed through technical solutions. Policy documents focus on emissions targets, energy transitions, and regulatory compliance. Climate strategies linked to international

commitments emphasize measurable indicators and sectoral reforms (UNFCCC, 2024; UNFCCC, 2025).

This approach creates a particular image of environmental governance. It presents it as a system that operates through expertise, data, and control. It suggests that environmental problems can be solved by improving efficiency and strengthening institutions.

Such a framework leaves little space for social questions. It does not ask who is more exposed to pollution. It does not consider who carries the burden of adapting to environmental change. It does not examine how environmental risks are experienced in everyday life.

Research on Kazakhstan shows that environmental governance is closely tied to economic priorities and state structures (Poberezhskaya, 2022). Industrial development, energy production, and economic stability remain central concerns. Environmental policy is often integrated into these

priorities rather than challenging them. This reinforces a model in which environmental governance is treated as a management issue rather than a social or political one.

5.3 Why Gender Matters Here

Ignoring gender in environmental governance has real consequences. Environmental risks are not distributed evenly. In many contexts, women are more involved in managing water, food, and household energy. They are often responsible for care work, which becomes more difficult under conditions of environmental stress.

Studies in Kazakhstan suggest that gender shapes everyday environmental behavior, including waste management and resource use (Zhidebekkyzy et al., 2023). . At the same time, women remain underrepresented in decision-making positions (UN Women, 2024).

When policy frameworks ignore these dynamics, they risk overlooking how environmental governance actually works in practice. Policies may appear effective on paper but fail to address the realities of those who implement them in daily life.

This issue is not unique to Kazakhstan. Many countries have faced similar challenges. Over the past two decades, international climate governance has increasingly recognized the importance of gender. Gender Action Plans under global climate frameworks encourage governments to integrate gender into climate policy. In some countries, this has led to concrete changes.

For example, gender-responsive budgeting has been introduced in environmental programs in parts of the European Union. Climate adaptation projects in countries such as Bangladesh have incorporated women’s knowledge in managing water and agriculture. These approaches do not simply “add women” to existing policies. They change how problems are defined and how solutions are designed.

Compared to these developments, Kazakhstan’s environmental governance remains at an earlier stage. Gender is acknowledged in general policy frameworks but is not integrated into

environmental law or climate strategy. This creates a gap between global discourse and national practice.

5.4 Participation Without Visibility

Another important aspect of environmental governance in Kazakhstan is the limited role of public participation. Formal procedures exist, but their impact is constrained. Environmental activism has grown in recent years, especially in response to pollution and industrial risks (Sari, 2023).

Case studies show that local communities do engage with environmental issues. In industrial regions, residents have organized protests and raised concerns about health and environmental safety (Kopack, 2025). These actions demonstrate that environmental governance is not only a top-down process. It is also shaped by local responses and social pressure.

However, these forms of participation are not fully reflected in official policy frameworks. Environmental conflicts are often treated as technical issues that require administrative solutions. This reduces the space for broader discussions about responsibility, justice, and inequality.

Within this context, women's participation becomes even less visible. Their involvement in community initiatives and everyday environmental management is rarely documented in policy discourse. This does not mean that women are absent. It means that their contributions are not recognized as part of governance.

5.5 Knowledge, Power, and What Counts

The absence of gender in environmental governance is closely linked to the way knowledge is valued. Policy frameworks prioritize scientific data, technical expertise, and institutional authority. These forms of knowledge are treated as objective and reliable. Other forms of knowledge are less visible. Everyday experience, local practices, and informal knowledge systems are rarely included in policy discussions. This creates a hierarchy in which some voices are considered more legitimate than others.

Feminist political ecology helps explain why this matters. It shows that knowledge is shaped by social position and power (Rocheleau et al., 1996; Nightingale, 2006). What is considered "objective" often reflects the perspectives of those who have access to institutions and decision-making processes.

Ecofeminist theory goes further by questioning the underlying assumptions of this hierarchy. It argues that modern systems of governance tend to separate reason from care and production from social reproduction (Plumwood, 1993; Warren, 2000). Activities linked to care, maintenance, and everyday survival are often undervalued.

Materialist ecofeminist thinkers connect this to economic systems. They show how environmental costs are often shifted onto households and communities, where they are absorbed

through unpaid labor (Mies & Shiva, 1993; Salleh, 2017). In such systems, the work that sustains both society and the environment remains largely invisible.

In Kazakhstan, this dynamic can be seen in the gap between formal policy and lived experience. Environmental governance is built around technical solutions and institutional authority. The knowledge that comes from everyday life is rarely included. This contributes to the broader invisibility of gender in environmental policy.

Chapter 6. Discussion

The analysis shows that the absence of gender in environmental governance in Kazakhstan is not simply a gap in policy language. It reflects a deeper way in which governance itself is understood and organized. Environmental policy is built around technical expertise, institutional authority, and measurable outcomes. Within this framework, social differences are not actively denied, but they are not treated as relevant.

This has important implications. When environmental governance is presented as neutral, it creates the impression that policies operate equally for everyone. In practice, this neutrality hides uneven impacts. It allows existing social structures to remain unexamined. Gender does not appear in policy not because it has been considered and rejected, but because the system does not recognize it as part of the problem.

Ecofeminist theory helps to make sense of this pattern. It argues that modern systems of governance are shaped by hierarchies that separate what is seen as rational and productive from what is associated with care and everyday life (Plumwood, 1993; Warren, 2000). Environmental governance in Kazakhstan follows this logic. It values scientific knowledge, regulatory control, and institutional coordination. It pays far less attention to the kinds of practices that sustain daily life and often fall outside formal systems.

This division is not neutral. It privileges certain forms of knowledge while marginalizing others. Technical expertise becomes the main source of authority, while lived experience is treated as secondary. As a result, the people who deal with environmental problems on a daily basis are rarely seen as contributors to governance. Their knowledge is not integrated into policy, even though it is essential for understanding how environmental issues unfold in practice.

Feminist political ecology offers a complementary perspective by focusing on how these dynamics operate on the ground. It shows that environmental governance is shaped not only by formal institutions, but also by social relations that influence access to resources and decision-making (Rocheleau et al., 1996; Nightingale, 2006). In a centralized system, these patterns become more pronounced. Decision-making is concentrated, and participation is structured in ways that limit the influence of those outside formal institutions.

In Kazakhstan, this results in a form of governance where environmental issues are managed rather than debated. Conflicts are framed as technical problems that require administrative solutions. This reduces the space for questioning how environmental risks are distributed and who

bears their consequences. It also makes it harder to bring attention to forms of inequality that are not easily measured.

The absence of gender fits into this broader pattern. Gender is not excluded through explicit policy decisions. It is excluded through the way environmental governance defines what matters. When policy focuses on emissions, infrastructure, and regulation, it leaves little room for examining how environmental change affects social roles, responsibilities, and everyday practices.

At the same time, this does not mean that gender is irrelevant in practice. Evidence from Kazakhstan suggests that women play an active role in responding to environmental challenges, particularly at the household and community levels (UNDP, 2023; UN Women, 2024). Their work often involves managing resources, adapting to environmental stress, and supporting family and community resilience. However, these contributions remain largely invisible in formal governance structures.

This creates a disconnect between policy and practice. Environmental governance appears coherent and complete when viewed through official documents. Yet this image does not fully reflect how environmental issues are experienced and managed in everyday life. What is missing is not only a category, but a different way of understanding governance itself.

Seen in a broader perspective, Kazakhstan is not an isolated case. Many resource-dependent and centralized systems rely on similar models of governance. They prioritize technical solutions, emphasize economic stability, and limit the role of social analysis. In such contexts, gender often remains outside the scope of environmental policy, even when it is recognized in other areas.

This suggests that addressing gender in environmental governance requires more than adding new language to existing policies. It requires a shift in how governance is approached. Environmental issues need to be understood not only as technical challenges, but also as social processes shaped by power, knowledge, and inequality.

Without this shift, efforts to improve environmental governance may remain incomplete. Policies can become more efficient and more aligned with international standards, yet still fail to address the realities of those most affected. Recognizing gender is one step in this process, but it also opens a broader question about whose experiences are included in governance and whose remain outside its boundaries.

Chapter 7. Conclusion

This study set out to examine how environmental governance in Kazakhstan is constructed and why gender remains largely absent within it. By focusing on policy documents adopted since 2019, the analysis has shown that this absence is not an accidental detail. It reflects a broader way of thinking about environmental governance, where technical solutions, institutional control, and measurable outcomes define what is considered relevant.

The findings suggest that environmental governance in Kazakhstan operates within a narrow framework that prioritizes regulation and efficiency while overlooking social complexity. Within this framework, differences in experience, responsibility, and vulnerability remain outside the

scope of policy attention. Gender does not enter governance debates because the system itself is not designed to recognize it as meaningful.

Approaching this issue through ecofeminism and feminist political ecology makes it possible to see what remains hidden in more conventional analyses. These perspectives show that environmental governance is not only about managing natural resources. It also involves decisions about whose knowledge matters, whose work is visible, and whose experiences shape policy priorities. In this sense, the absence of gender is closely linked to broader hierarchies of knowledge and power.

The case of Kazakhstan highlights a wider pattern found in many centralized and resource-dependent systems. Environmental governance tends to develop as a technical field, closely connected to economic planning and state-led decision-making. This creates limited space for alternative perspectives, especially those rooted in everyday life. As a result, important dimensions of environmental change remain underexplored, even when they are visible in practice.

Recognizing this gap is important for both research and policy. Without a clearer understanding of how environmental governance interacts with social realities, efforts to improve sustainability risk remaining incomplete. Policies may become more advanced in formal terms, yet still fail to address how environmental problems are experienced and managed on the ground.

This study does not aim to provide final answers. Instead, it opens a direction for further research. Future work could build on this analysis by exploring how women and other groups engage with environmental governance in practice, and how their perspectives might reshape policy approaches. Bringing these experiences into analysis is not simply a matter of inclusion. It is essential for developing a more accurate and grounded understanding of environmental governance.

In the end, the question is not only whether gender should be included in environmental policy. It is whether environmental governance can be fully understood without considering the social relations that shape it. This study suggests that it cannot.

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Beyond Demographics: Using Behavior and Sentiment for Customer Segmentation

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BACKGROUND AND MOTIVATION

Customer segmentation has long served as a fundamental tool of marketing strategy, allowing companies to identify different customer groups and adapt value propositions accordingly. Traditional approaches, in particular demographic-based segmentation, have given way to more data-driven methods as digital platforms generate more and more extensive behavioral data. Among them, one of the most widely used segmentation models has become the Novelty-Frequency-Cost (RFM) system, which is valued for its simplicity, interpretability, and close relationship to the value of a customer's life (Ernawati, Baharin, & Kasmin, 2021; Fader et al., 2005).

At the same time, the digital environment has fundamentally changed the way customers express their impressions. Online review platforms are now creating vast repositories of user-generated texts reflecting not only what customers are doing, but also how they feel. Sentiment analysis, the automatic extraction of emotional coloring from text data, has been widely proven to capture aspects of consumer experience that cannot be obtained solely through behavioral indicators: satisfaction, perceived quality, emotional engagement, and loyalty (Liu, 2012; Hu, Pavlou, & Zhang, 2009). It is important to note that two customers may have the same RFM characteristics, but completely different attitudes towards the product. One may make a repeat purchase out of genuine enthusiasm, the other out of habit, due to limited alternatives or high transition costs (Burnham, Frels, & Mahajan, 2003). Behavioral data does not allow us to distinguish between these cases, but feelings can do it.

Despite the growing interest in behavioral analytics and sentiment analysis, there is a continuing gap in the literature: most studies consider these data streams separately. Behavioral segmentation research focuses on transactional data, while sentiment research typically focuses on measuring satisfaction or analyzing usefulness rather than segmentation outcomes. Only a few studies have attempted to integrate both types of data, and almost none of them directly compare behavior-only, sentiment-based segmentation models and combined segmentation models in terms of cluster quality and managerial interpretability. This gap motivates this study.

RESEARCH QUESTIONS AND HYPOTHESES

This study addresses three main issues. First, how does sentiment-based segmentation differ from RFM segmentation by the customer groups it defines? Secondly, does adding sentiment

characteristics to the RFM allow for more consistent and interpretable customer clusters? Third, what additional practical value, if any, does the combined model offer for targeting and customer retention strategies?

During the analysis, three hypotheses were put forward. In H1, it was predicted that sentiment-only segmentation would identify customer groups other than those obtained through RFM, based on the fact that sentiment reflects attitude rather than behavior. In H2, it was predicted that a combination of behavioral and emotional characteristics would produce clusters with higher rates of internal validity. H3 predicted that the combined model would provide more useful marketing information than any of them individually.

METHODOLOGY

The study used the Amazon Reviews dataset for 2023 (Movies and TV category), released by McAuley Lab and publicly available on the Hugging Face platform. This dataset contains more than two million reviews with fields that include text reviews, star ratings, reviewer IDs, product IDs, timestamps, and confirmed purchase flags -all variables necessary to build behavior and sentiment profiles are taken from a single source.

Three segmentation models were developed and compared using an identical analytical pipeline. The RFM-only model took into account novelty (the number of days since the last review), frequency (the total number of reviews), and an adapted monetary indicator (the average number of words per review, reflecting the depth of engagement) at the user level. The sentiment-only model extracted polarity scores from the review text using VADER (Valence Aware Dictionary and sEntiment Reasoner), a vocabulary-based tool specifically designed for short, informal, and user-generated texts, and combined them into an average, median, and variance of polarity for each user (Hutto & Gilbert, 2014). The choice in favor of VADER among transformer-based alternatives was made due to its high performance in processing consumer feedback data, large-scale computational efficiency and interpretability, all of which are important given the research nature and large volume of the dataset. The combined model combined all RFM and sentiment functions into a single vector of functions for each user.

All characteristics were standardized using z-point normalization before clustering. K-mean clustering was used as the main algorithm, with k values ranging from 3 to 7; hierarchical clustering served as a secondary verification method. Due to the large size of the complete dataset, a two-step analytical approach was implemented: first, the pipeline was developed and tested on a sample of about 100,000 observations, and then applied to the entire dataset using a streaming method that combined user-level functions without simultaneously loading all observations into memory. Cluster quality was assessed using three standard internal validation indicators: the Silhouette score, the Davis-Boulden Index (DBI), and the Kalinski-Kharabash index (CHI).

KEY FINDINGS

The results obtained made it possible to obtain a complex and, in one important aspect, counterintuitive result. Unlike H2, the combined RFM and sentiment model did not surpass the RFM-only model in any clustering quality indicators. The RFM-only model allowed us to obtain more compact and better separated clusters for all three evaluation indices. The conclusion of H1 was confirmed: sentiment-based segmentation did indeed identify clear customer groups compared to RFM, reflecting emotional differences that are not visible in behavioral data. H3 received partial support - while the combined model did not improve the quality of statistical clusters, sentiment data increased the depth of segment interpretation, even if they were used along with behavioral characteristics.

The main explanation for the low efficiency of the combined model lies in the distribution characteristics of the dataset. Reviews of movies and TV shows on Amazon are strongly biased towards positive ratings and sentiments. When sentiment estimates are not variable - when most users are grouped around a high polarity - the variable makes little contribution to the clustering process and can create interference that reduces the separation of clusters. A secondary factor is the potential overlap between ratings (used as a monetary indicator) and sentiment ratings, since both partially reflect customer satisfaction. When two variables encode similar information, including both may reduce rather than increase the clarity of the model.

Despite the fact that clustering efficiency has not improved, sentiment analysis has proved to be a valuable additional interpretative tool. The analysis revealed four significant customer segments: (1) active, very satisfied customers representing the group with the highest value; (2) inactive, but satisfied customers who, despite positive sentiments, stopped cooperating, which indicates the risk of outflow; (3) dissatisfied customers characterized by low ratings and negative reviews; and (4) a segment with moderate engagement and mixed feedback. Notably, the sentiment data showed that some customers with identical RFM profiles held significantly different views - a difference that behavioral data alone cannot make obvious, and which is directly relevant to personalized marketing.

The consistency of segmentation results between sample and complete datasets provides additional confidence in the reliability of the methodology and demonstrates that traditional segmentation approaches can be effectively applied to large-scale data from a real-world digital platform.

CONTRIBUTIONS AND IMPLICATIONS

This study makes a definite contribution. Theoretically, it fills a gap in the literature by providing a direct empirical comparison of behavior-only, sentiment-only, and combined segmentation models - a comparison that, to the author's knowledge, has not previously been conducted within a single unified framework. Methodologically, it demonstrates a scalable pipeline for applying segmentation to over two million records and validates the use of an adapted RFM framework in non-transactional digital platform contexts.

Perhaps the most important theoretical contribution is to refute the generally accepted assumption that including more data or more complex data types automatically improves analysis results. This study shows that integration should be evaluated empirically, not assumed. The meaning of sentiment in segmentation depends on the context and is determined by the properties of the data distribution and the degree to which behavioral signals and attitudes match.

From a managerial point of view, the results have a number of practical implications. RFM remains a reliable, interpretable, and effective framework for customer segmentation, especially for organizations that lack the resources to build more complex models. Identifying an inactive but satisfied segment is a high-priority customer retention opportunity: these customers have demonstrated a positive attitude and can be re-engaged through targeted re-engagement campaigns, personalized recommendations, or loyalty incentives. An unsatisfied segment signals the need for active efforts to restore the service based on the specific topics indicated in the text of the review. More broadly, the study suggests that sentiment analysis is best used not as a driving force for clustering, but as an interpretive layer after segmentation, which allows for a better understanding of what each cluster is and why they behave the way they do, rather than defining the cluster structure itself.

CONCLUSION

This study examined whether integrating mood characteristics into behavioral segmentation improves the quality and interpretability of customer clusters, using the Amazon Reviews film and TV dataset for 2023 as a single empirical base. The results show that the RFM system remains a powerful and effective segmentation tool, while sentiment analysis, while not improving clustering efficiency in this context, adds significant interpretive value that supports more nuanced and targeted marketing strategies. The study concludes that the effectiveness of segmentation is determined not by the volume or complexity of the data, but by the relevance, variability and complementarity of the selected variables. Future research should explore alternative sentiment assessment methods, include factual transaction data, and explore dynamic segmentation approaches that take into account the temporal evolution of customer behavior and attitudes.

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Bridging the Gap: Aligning Graduate Skills with HR Needs in Kazakhstan's Public Sector

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ABSTRACT

This study examines the alignment between Master's-level public-administration education in Kazakhstan and the competency needs documented for the country's public sector. Adopting a qualitative document-analysis design framed as a single instrumental case study, it compares two documentary corpora against a common five-domain competency framework: the curricula of seven Master's programmes in public and local administration (174 course disciplines), representing the competency 'supply'; and a demand-side corpus of six National Reports on the State of the Civil Service (2018–2024) together with five OECD policy reports, representing the documented competency 'demand'. The analysis finds a consistently knowledge-centered curricular profile: public-sector knowledge and, increasingly, digital competence are well represented, whereas experiential learning is confined to the nationally mandated professional and research internships and structured employer engagement is largely absent. Set against the documented demand, curricula align well on digital competence, ethics, and strategic and financial management, but align weakly on the service-oriented, citizen-centered competencies the state increasingly emphasizes and on sector-specialist provision, which the National Reports record as persistently scarce despite high formal qualification levels. The study contributes a document-grounded, supply-and-demand account of graduate–employer alignment in a transitional governance setting, and identifies reform toward applied, service-oriented, and sector-specific competencies, together with stronger education–employer coordination, as priorities. Extending the analysis to practitioner perspectives is identified as a direction for future research.

Keywords: graduate employability; public administration; competency frameworks; curriculum alignment.

INTRODUCTION

1.1 Background and Context

Across the world, higher education systems are under growing pressure to produce graduates who can function effectively in rapidly transforming labor markets. These markets are

being reshaped by digitalization, automation, public-sector modernization, and the transition toward greener and more adaptive economies. Such structural transformations have significantly altered the competency profiles expected of graduates, especially those entering public administration and civil service roles. Governments increasingly require employees who possess not only technical knowledge of public institutions but also analytical reasoning, digital literacy, communication capacity, policy adaptability, and problem-solving skills suitable for complex governance environments (OECD, 2023; UNDP, 2020). In this context, employability is no longer understood merely as the possession of a degree; it is increasingly framed as the capacity to apply interdisciplinary, transferable, and context-sensitive competencies in dynamic organizational settings (Yorke, 2006; Tomlinson, 2017).

These pressures have generated sustained policy responses in Europe that emphasize employability, lifelong learning, competence-based curricula, and stronger alignment between higher education and labour-market demands. The European Skills Agenda calls for educational institutions to prepare learners for sustainable competitiveness, social resilience, and digital transformation by embedding future-oriented competencies into teaching and training systems (European Commission, 2020), while CEDEFOP has positioned skills intelligence, labor-market forecasting, and employer engagement as central mechanisms for improving graduate readiness (CEDEFOP, 2022, 2023). OECD analyses of European skills strategies further show that countries achieving stronger alignment rely on integrated, cross-sectoral coordination among ministries of education, labor, and public administration (OECD, 2024). These policy currents are anchored in the European Higher Education Area (EHEA) and the Bologna Process, which have progressively pushed institutions toward learning outcomes, competence-based education, and employability-oriented programme design. The Rome Communiqué reaffirmed that higher education must equip students with competencies for democratic participation, employability, innovation, and resilience (EHEA, 2020), and the Tirana Communiqué strengthened this direction by emphasizing inclusion, relevance, and the role of higher education in supporting digitally capable societies (EHEA, 2024).

Kazakhstan has pursued many of these reforms as part of its long-term modernisation agenda. Since joining the Bologna Process, the country has aligned its higher education system with EHEA principles, including the three-cycle degree structure, learning outcomes, credit transfer mechanisms, and stronger emphasis on quality assurance and internationalization. In parallel, Kazakhstan has launched major initiatives to modernize its civil service. The Concept for Civil Service Development 2023–2029 reflects a strategic commitment to professionalization, competency development, digital transformation, and more effective human-resource practices in the state apparatus (ACSAK, 2023). The National Project for Higher Education Development 2025–2029 similarly emphasizes modernization of academic programmers, graduate employability, and stronger connections between universities and labor-market needs (MSHE, 2023).

However, the implementation of these reforms must be understood within Kazakhstan's post-Soviet institutional context. Although formal reforms have advanced, post-Soviet administrative systems often retain legacies of bureaucratic rigidity, hierarchical management, fragmented institutional coordination, and limited responsiveness to labor-market feedback. These historical features can weaken the effectiveness of both human-resource reform and curriculum modernization by sustaining a gap between formal policy design and actual institutional practice (Verheijen, 2007). The challenge is therefore not only to introduce competence-based models on paper, but to embed them in the everyday practices of universities, ministries, and public organizations.

This tension is particularly visible in the public sector, where graduate readiness is especially important. Public institutions require young professionals who can operate within increasingly digitalized administrative systems, communicate effectively with citizens and stakeholders, understand policy implementation, and adapt to ongoing governance reforms. These expectations often evolve faster than university curricula. As a result, the question of whether public-administration graduates are adequately prepared for contemporary public-sector work has become a critical issue for both educational institutions and government employers in Kazakhstan.

The present study is therefore situated at the intersection of three broader transformations: the global skills transition, European higher-education reform, and Kazakhstan's public-sector modernization agenda. It addresses a central concern that lies beneath all three: whether universities are producing graduates whose competencies meaningfully align with the realities and expectations of public-sector employment.

1.2 Problem Statement

Despite extensive higher education and civil-service reforms, evidence suggests that Kazakhstan continues to face a persistent mismatch between the competencies produced by universities and the skills required in the public sector. This mismatch is not unique to Kazakhstan; it is widely documented in both developed and transitional economies (McGuinness et al., 2018). However, in Kazakhstan, the problem is particularly significant because it affects the state's capacity to modernize governance, improve administrative effectiveness, and deliver more citizen-oriented public services.

OECD assessments indicate that employers in Kazakhstan continue to identify notable gaps in the analytical, digital, and communication competencies of graduates, particularly in areas requiring applied problem-solving and adaptive performance rather than purely theoretical knowledge (OECD, 2020). Domestic quality-assurance evidence echoes these concerns. The Independent Agency for Quality Assurance in Education reported that a substantial proportion of employers, including those in public institutions, perceive graduate preparedness as below expectations, especially in practical policy work, e-governance capacities, and workplace-ready

communication skills (IQAA, 2023). The World Bank has noted that while Kazakhstan has made substantial progress in modernizing higher education and public administration, curriculum renewal has often not kept pace with the changing competency demands generated by digital government, administrative innovation, and public-service transformation (World Bank, 2021).

This creates a structural problem. Public institutions in Kazakhstan increasingly require employees who can navigate digital systems, work with data, engage in policy analysis, communicate across departments and with the public, and adapt to evolving regulatory and technological environments (Bokayev et al., 2024; Sabdenov et al., 2025). Yet evidence from curriculum analyses suggests that universities continue to prioritize content coverage and discipline-based knowledge at the expense of integrated, practice-oriented competency development (Iskindirova et al., 2024). As a result, graduates may enter public-sector roles with academic qualifications but without the full set of applied competencies needed for effective job performance.

Comparative evidence suggests that countries addressing such mismatch more successfully tend to rely on coordinated skills-ecosystem approaches rather than isolated reforms. In many European systems, stronger alignment is achieved through structured employer feedback, labour-market intelligence, curriculum co-design, internships, competency frameworks, and policy coordination across sectors (CEDEFOP, 2022; OECD, 2024). In Kazakhstan, by contrast, reforms often remain fragmented across education, public administration, and labor-market governance institutions.

The central problem, therefore, is that Kazakhstan's higher education and public-sector HR systems appear insufficiently aligned in practice, resulting in a persistent gap between graduate competencies and the real needs of public institutions. This study addresses that problem by examining how the public sector's documented competency needs—articulated in national civil-service reporting and international policy reviews—correspond to the formal competency signals embedded in public-administration curricula.

1.3 Purpose of the Study

The purpose of this study is to investigate whether higher education in Kazakhstan is producing the competencies that the public sector documents as needed, by comparing the competency requirements articulated in national and international policy records with the competency signals embedded in formal public-administration curricula, within a focused qualitative document-analysis design. Specifically, the study seeks to identify which competencies the curricula appear to supply adequately, which appear under-supplied relative to documented needs, and what curricular or policy changes may improve alignment between higher-education provision and public-sector competency requirements.

This purpose is grounded in the assumption that alignment cannot be assessed from a single vantage point. The documented competency demands of the public sector and the formal competency intentions of curricula each offer a distinct, evidentiary perspective on readiness. By triangulating the demand-side documentary record against the curricular supply, the study aims to move beyond single-source description toward a more integrated, document-grounded assessment of the competency alignment problem.

The study also contributes a more practice-oriented understanding of graduate employability in the public sector. Much of the existing literature focuses broadly on graduate outcomes, labour-market transitions, or employer expectations across sectors. While valuable, such literature does not sufficiently capture the distinctive competency needs of public institutions, especially in transitional governance contexts such as Kazakhstan. By focusing specifically on the public sector's own documented competency requirements—articulated in national civil-service reporting and international policy reviews—alongside curriculum content, this study provides a document-grounded lens on a domain where employability is linked not only to individual career success but also to state capacity, public-service quality, and administrative modernization.

In addition, the study seeks to generate actionable recommendations for policymakers, universities, and public organizations. By identifying the most frequently observed gaps and the institutional barriers that sustain them, the research can inform curriculum improvement, employer engagement strategies, internship and practicum design, competency-based learning, and policy coordination between higher education and civil-service systems.

1.4 Research Questions

To achieve the purpose of the study, the following research questions guide the inquiry:

RQ1. What competencies does the documentary record—Kazakhstan's National Reports on the State of the Civil Service and comparative OECD policy reports—identify as required for entry-level public-sector work?

RQ2. What gaps between graduate preparation and public-sector competency needs are evident in the documentary and curricular record?

RQ3. How do the formal curricula of selected Master's-level public-administration programs reflect these documented competency requirements?

RQ4. To what extent do the competencies embedded in public-administration curricula align with the competencies documented as needed by Kazakhstan's public sector?

These research questions are answered through qualitative document analysis. RQ1 is addressed through analysis of the demand-side documentary corpus—the National Reports on the State of the Civil Service (Appendix B) and comparative OECD reports. RQ2 is addressed by

comparing that documented demand with the competency 'supply' coded from curricula, identifying where the record reveals gaps. RQ3 is addressed through structured curriculum document analysis using the coding framework in Appendix A. RQ4 is an integrative question addressed by comparing the curricular and documentary findings within a common competency framework

1.4.1 Operational Definitions

Several terms recur throughout this study and require precise operational definition. These definitions guide the coding framework, corpus selection, and analytic interpretation across the study's documentary sources.

Competency. An observable combination of knowledge, skills, motives, traits, and behaviours that enables successful task execution in a specific context (Spencer & Spencer, 1993). The term thus extends beyond credential possession to include applied behavioural and motivational capabilities.

Skills mismatch. A condition in which the skills possessed by workers do not correspond to those required by their jobs, encompassing over-education, under-skilling, and horizontal mismatch (McGuinness et al., 2018).

Alignment. Used in this study to denote the degree of correspondence between (i) the competencies documented as required by the public sector, as articulated in national civil-service reporting and comparative international policy reviews, and (ii) the curricular intentions encoded in formal programme documents, evaluated within a common five-domain competency framework. The study examines whether these two evidentiary perspectives converge or diverge across the same competency domains.

Public sector. Encompasses central-government ministries, central-government agencies, local executive bodies (akimats), and quasi-public institutions (state-owned enterprises and joint-stock companies with majority state ownership) operating under the Civil Service Law of the Republic of Kazakhstan and related public-administration regulations. The documentary record analysed in this study reports on both the governmental and the quasi-governmental segments of this sector.

Entry-level position. A public-sector position requiring zero to two years of post-graduation professional experience and typically corresponding to junior administrative or specialist grades within the civil-service classification.

Recent graduate. A person who has completed an undergraduate or master's degree in public administration or a closely related field within the past 24 months.

Public-administration programme. An accredited bachelor's or master's degree programme in Kazakhstan whose primary disciplinary focus is public administration, public policy, public management, or state and municipal administration ("gosudarstvennoe i munitsipal'noe upravlenie").

1.5 Significance of the Study

1.5.1 Academic Significance

Academically, the study contributes to the literature on graduate employability, competency development, and public-sector workforce readiness by examining these issues in a post-Soviet governance context. Much of the dominant scholarship on employability and skills alignment has emerged from Western European, Anglo-American, or OECD contexts. Kazakhstan provides a valuable case because it combines formal convergence with European educational standards and continuing institutional legacies from Soviet and post-Soviet governance traditions. The study also extends Competence Theory, Employability Theory, and Skills Ecosystem Theory by integrating them within a single empirical design focused on public-sector alignment in a transitional governance setting.

1.5.2 Policy Significance

At the policy level, the study is directly relevant to Kazakhstan's ongoing reform agendas in both higher education and public administration. The Concept for Civil Service Development 2023–2029 (ACSAK, 2023) and the National Project for Higher Education Development 2025–2029 (MSHE, 2023) both call for stronger links between competency development and labour-market needs. By documenting how the public sector articulates its competency needs and how curricula encode competency intentions, the study provides evidence-based insights for policymakers seeking to improve competency frameworks, graduate tracking, internship pipelines, and employer feedback mechanisms.

1.5.3 Practical Significance

Practically, the study can help universities, departments of public administration, and public-sector employers identify concrete areas for improvement. Findings will inform curriculum redesign, teaching methods, assessment formats, and experiential learning opportunities based on the specific gaps identified. For universities, the study supports the case for stronger use of employer advisory boards, internships, simulation-based learning, case analysis, applied policy writing, and competence-based assessment. For public organisations, it supports more structured engagement with academic partners through co-designed curricula, structured mentoring, and joint employability initiatives.

1.6 Theoretical Framework

This study is guided by a multi-level theoretical framework that combines Competence Theory (micro level), Employability Theory (meso level), and Skills Ecosystem Theory (macro level), with the Bologna Process and EHEA competence-based standards serving as a policy bridge.

1.6.1 Competence Theory (Micro Level)

At the micro level, the study draws on Competence Theory, which argues that effective performance is best understood through competencies—observable combinations of knowledge, skills, motives, traits, and behaviours that enable successful task execution in specific contexts (Spencer & Spencer, 1993). This perspective is highly relevant because HR professionals in public institutions do not assess graduates merely on whether they possess degrees; they assess whether graduates can perform in real workplace situations. The study therefore uses Competence Theory to interpret HR perceptions as judgments about applied capability rather than formal qualification alone.

Competence Theory is operationalised through the documentary sources. Curricula are coded for the competency domains they embed (Domains 1–2 of the framework in Appendix A), while the National Reports and OECD corpus are read for the threshold and differentiating competencies the state and international bodies document as required (Appendix B). Comparing the two locates employer-relevant competencies against curricular intentions within a shared analytic frame.

1.6.2 Employability Theory (Meso Level)

At the meso level, the study is informed by Employability Theory, which conceptualises graduate readiness as a multidimensional construct involving discipline-specific knowledge, transferable skills, reflective capacity, adaptability, identity formation, and social or cultural capital relevant to labour-market transitions (Suleman, 2018; Jackson & Bridgstock, 2021). This framework recognises that graduates succeed not only when they possess knowledge, but when they can mobilise it in unfamiliar settings, communicate effectively, learn continuously, and navigate institutional expectations. In public-sector contexts, a graduate may understand public administration in theory yet still struggle with interdepartmental communication, policy drafting, or digital workflow systems. Research on internships and work-integrated learning further demonstrates that experiential exposure during university strengthens transition readiness (Jackson & Tomlinson, 2021; Silva et al., 2021).

Employability Theory is operationalised by coding the experiential and work-integrated components of curricula (Domains 3–4 of the framework in Appendix A) and by reading the documentary record for the transition supports and applied-readiness expectations it articulates.

1.6.3 Skills Ecosystem Theory (Macro Level)

Skills Ecosystem Theory is operationalised by coding employer-engagement and system-coordination features in curricula (Domain 5 of the framework in Appendix A) and by reading the National Reports and OECD corpus (Appendix B) for the systemic shortages, coordination mechanisms, and in-service development the record documents.

1.6.4 Policy Bridge: Bologna Process and EHEA Standards

The theoretical framework is anchored in the competence-based educational logic promoted by the Bologna Process and the EHEA. For Kazakhstan, this policy bridge is important because many reforms have been formally aligned with EHEA principles. However, the key question is whether this formal alignment has translated into effective competency formation in practice. The present study uses this tension—between formal reform and practical outcomes—as a central interpretive lens. Taken together, these frameworks provide a coherent analytical structure: Competence Theory explains how job readiness is perceived at the individual level, Employability Theory explains how graduates transition into work as multifaceted actors, and Skills Ecosystem Theory explains how institutional coordination shapes the broader conditions of alignment or mismatch.

1.6.5 Framework Synthesis

Table 1 synthesises the multi-level framework, mapping each theoretical level to its analytical level, key constructs, primary authors, the research questions it addresses, and the specific instrument items through which it is operationalised across the two documentary corpora. The table also makes visible how the same competency domains are observed from two perspectives—formal curriculum signals and the documented competency demand—enabling the cross-corpus integration described in Chapter 3.

Table 1 ***Multi-level theoretical framework: theories, levels, key constructs, research questions, and instrument mappings.***

Theory	**Level**	**Key Constructs**	**Primary Authors**	**RQs**	**Instrument Items**
Competence Theory	Micro (individual)	Threshold vs. differentiating competencies; observable knowledge, skills, motives, traits, behaviours	Spencer & Spencer (1993); Kaur & Kaur (2021)	RQ1, RQ2, RQ4	Curriculum coding Domains 1–2 (Appendix A); National Reports and OECD corpus (Appendix B)
Employability Theory	Meso (organisatio	Multidimensional readiness; transferable skills;	Suleman (2018); Jackson & Bridgstock	RQ1, RQ3	Curriculum coding Domains 3–4

	nal / transition)	adaptability; work-integrated learning; reflective capacity	(2021); Jackson & Tomlinson (2021); Silva et al. (2021)		(Appendix A); documentary record (Appendix B)
Skills Ecosystem Theory	Macro (system)	Coordination across education, labour market, policy; structural mismatch; feedback loops	McGuinness et al. (2018); O'Neill (2021); Thake (2025)	RQ2, RQ3, RQ4	Curriculum coding Domain 5 (Appendix A); document analysis (Appendices B–C)
Policy Bridge: Bologna / EHEA	Cross-cutting (policy)	Competence-based education; learning outcomes; employability orientation; formal vs. practical alignment	EHEA (2020, 2024); European Commission (2020); CEDEFOP (2022, 2023)	Cross-cutting	Frames the document-analysis criteria and the alignment assessment

1.7 Research Design Overview

The study employs a qualitative document-analysis design, framed as a single, instrumental case study bounded to the documentary record (Yin, 2018; Stake, 1995). The bounded case is the alignment between Master's-level public-administration education and the documented competency needs of Kazakhstan's public sector, examined to illuminate the wider skills-mismatch problem. Within this case, two documentary corpora are analysed against a common competency framework (Section 1.6): (i) public-administration curricula (the competency 'supply'); and (ii) Kazakhstan's National Reports on the State of the Civil Service together with comparative OECD reports (the documented competency 'demand'). Analysing these corpora within a single bounded case enables data triangulation and a holistic, document-grounded assessment of alignment.

This design is appropriate because the alignment problem is inherently multi-perspectival, and document analysis within a bounded case is well suited to integrating several evidentiary perspectives on a single phenomenon. Curricula encode the formal competency intentions of the education system (the supply side), while the National Reports and OECD evidence articulate the competency demands, recruitment priorities, and skill shortages that the state and international bodies document (the demand side). Their convergence within the case enables a triangulated assessment of where alignment is achieved and where it breaks down. The detailed methodology, including case definition, corpus selection, and analytic procedures, is presented in Chapter 3, with the coding framework and documentary corpus provided in Appendices A and B.

2. Methodology

2.1 Research Approach and Design

This study applies a qualitative document-analysis design, framed as a single, instrumental case study (Yin, 2018; Stake, 1995), to investigate the alignment between graduate competencies and the documented competency needs of Kazakhstan's public sector. A case study is appropriate because the research seeks an in-depth, holistic understanding of a contemporary phenomenon—graduate–employer competency alignment—within its real-world context, where the boundaries between the phenomenon and that context are not clearly separable (Yin, 2018; Stake, 1995). The case is instrumental (Stake, 1995): the bounded case is the alignment between Master's-level public-administration education and the documented competency needs of Kazakhstan's public sector, examined to illuminate the wider skills-mismatch problem. Consistent with case study logic, the design draws on multiple documentary sources of evidence that converge on the same case, enabling triangulation and a more credible account than any single source could provide (Yin, 2018; McGuinness et al., 2018).

The case is bounded analytically and contextually. Analytically, the unit of analysis is the competency alignment between what public-administration programmes formally cultivate and what the public sector documents as needed at entry level. Contextually, the case is bounded to Kazakhstan, to the Master's level of public-administration education, and to the current reform period reflected in the documentary record (2018–2025). Within this single case, two documentary corpora are examined: (i) curriculum documents from Kazakhstani Master's-level public-administration programmes; and (ii) Kazakhstan's annual National Reports on the State of the Civil Service (Agency for Civil Service Affairs, 2019–2025), read alongside comparative OECD policy reports. Both corpora are analyzed against the common competency framework derived from Section 1.6, so that the curricular 'supply' and the documented 'demand' can be compared within the case.

The case is investigated through two converging documentary sources rather than a single method. The first is curricular: curriculum documents from Kazakhstani universities offering Master's-level public-administration programmes are analyzed to identify the formal competency signals embedded in programme learning outcomes, course descriptions, and practical-training components, establishing the competency 'supply' side of the case. The second is the policy record: Kazakhstan's annual National Reports on the State of the Civil Service, read alongside comparative OECD reports, are analyzed to identify the competency demands, recruitment priorities, and skill shortages that the state and international bodies document, establishing the competency 'demand' side. Bringing these sources together within the bounded case allows the study to assess alignment between curricular intentions and documented public-sector competency needs through data triangulation.

2.2 Data Collection Methods

2.2.1 Document Analysis: Population, Sampling, and Materials

The document analysis examines the formal competencies embedded in Kazakhstani Master's-level public-administration programmes. Because the alignment problem under investigation is national in scope but unevenly distributed across the country, the curriculum sample is constructed through stratified purposive sampling rather than ad hoc institutional selection. This sub-section specifies the population, the stratification scheme, the sample-size calculation, the within-stratum selection logic, the resulting sample, and the document types analyzed for each programme.

Population. The population consists of all Kazakhstani higher-education institutions that offer a Master's-level programme in public administration, public policy, public management, or state and municipal administration (Russian: gosudarstvennoe i munitsipal'noe upravlenie). A scoping search of the national programme registry and institutional websites identified 25 such institutions. This is the sampling frame for the document-analysis strand.

Stratification. Institutions are stratified by the macro-region in which their main campus is located, using a five-region scheme: South (Almaty, Shymkent, Taraz, Kyzylorda, Turkistan, Taldykorgan), Centre (Astana), North (Kostanay, Pavlodar), West (Atyrau, Aktobe, Aktau, Uralsk), and East (Oskemen, Semey). The South stratum contains 13 institutions (52% of the population), Centre 3 (12%), North 2 (8%), West 5 (20%), and East 2 (8%). Stratification by region is theoretically justified because public-administration provision in Kazakhstan is shaped by regional labour markets, the spatial distribution of civil-service employers, and historical differences in institutional development; a sample drawn without geographic stratification would systematically over-represent the dominant southern metropolitan tier.

Sample size and proportionate allocation. A sample of seven institutions is selected. This size is determined by two constraints: each stratum must contribute at least one institution to ensure regional representation, and the South—which accounts for more than half of the population—must contribute enough institutions to permit within-stratum variation. Proportionate allocation at $n = 7$ yields three institutions from the South (raw allocation 3.64), and one institution from each of Centre, North, West, and East (raw allocations 0.84, 0.56, 1.40, and 0.56 respectively). The East and North strata are slightly over-represented relative to their population shares because of the floor constraint of one institution per stratum; the West is slightly under-represented for the same reason. This is a known feature of stratified sampling with regional floors and is acknowledged here rather than concealed; the consequence for interpretation is that within-stratum claims about the East, North, and West rest on a single institution and are reported as illustrative rather than representative of those strata.

Within-stratum selection logic. Within each stratum, institutions are selected purposively for maximum variation along a theoretically meaningful axis: institutional type. Four institutional types are distinguished: (a) national flagship research universities; (b) the dedicated civil-service academy; (c) private and internationally accredited universities; and (d) regional state universities. Within the South stratum, where three institutions are selected, the within-stratum sample is stratified along this axis to capture the diversity that a single Almaty pick would mask. Within the other four strata, the single institution selected is the one whose institutional type and curricular reach make it most informative about regional public-administration provision.

Table 3 presents the resulting sample with the rationale for each selection. The proportionate allocation across strata closely tracks the population proportions, with the deviations explained above.

Table 2 *Stratified sample of Kazakhstani universities for curriculum document analysis (n = 7).*

Stratum	**n**	**Institution**	**City**	**Institutional Type**	**Selection Rationale**
South	1	Al-Farabi Kazakh National University	Almaty	National flagship	Largest national research university; early Bologna adopter; benchmark for mainstream Kazakhstani PA provision.
South	2	KIMEP University	Almaty	Private, international-standard	English-medium private institution with international accreditation; benchmark for the international-standard track and a key reference point for employer expectations.
South	3	Akhmet Yassawi International Kazakh-Turkish University	Turkistan	International-cooperation regional	Non-Almaty southern provision under an international cooperation arrangement; captures within-stratum heterogeneity beyond the metropolitan tier.
Centre	1	Academy of Public Administration under the President of the Republic of Kazakhstan	Astana	Civil-service academy	Principal training institution for the civil service; explicitly referenced in the Concept for Civil Service Development 2023–2029 (ACSAK, 2023); uniquely informative for the alignment question.
North	1	A. Baitursynuly Kostanay	Kostanay	Regional state university	Established northern regional university with a full PA cycle; representative of

		Regional University			regional state provision in the North.
West	1	M. Utemisov West Kazakhstan University	Uralsk	Regional state university	Regional university offering all three-degree cycles in PA; representative of established western regional provision.
East	1	S. Amanzholov East Kazakhstan University	Oskemen	Regional state university	The eastern regional flagship offering a full PA cycle; one of only two East-stratum institutions in the population, selected for breadth of provision.

The final sample will be confirmed during the ethics-approval phase contingent on (i) public availability or institutional authorization of the relevant programme documents and (ii) confirmation that each programme remains active in the current admission cycle. If a selected institution declines or its documentation proves insufficient, replacement is made within the same stratum, prioritizing institutional-type equivalence.

The analysis examines four document types per programme: (i) the official programme description and learning outcomes; (ii) course-level syllabi for required modules; (iii) internship and practicum regulations or guidelines; and (iv) graduate competency profiles where published. Documents are coded against a five-domain competency framework derived from the theoretical framework (Section 1.6), ensuring analytical coherence across the documentary corpora. The coding framework comprises five competency domains: (a) general transferable competencies (communication, teamwork, problem-solving, adaptability); (b) digital and analytical competencies (e-governance tools, data-informed reporting, digital document management); (c) public-sector workplace competencies (formal correspondence, procedural compliance, hierarchical navigation, service ethics); (d) experiential and work-integrated components (internship structure, mentoring, assessment); and (e) employer-engagement features (advisory boards, practitioner lectures, co-designed modules). The coding framework is presented in full in Appendix A.

In addition to the curriculum corpus, the document analysis examines a second documentary corpus: Kazakhstan's annual National Reports on the State of the Civil Service, published by the Agency for Civil Service Affairs (Agency for Civil Service Affairs, 2019–2025). These reports are the authoritative public account of the condition of the civil service and are submitted under the Law on Civil Service. Six reports are analyzed, spanning civil-service activity for 2018 and 2020 through 2024. Each report is issued in the year following the period it covers, so the report documenting 2020, for example, is the one published in 2021. Whereas the curriculum corpus encodes the competency 'supply' generated by universities, the National Reports articulate the competency 'demand' the state documents for itself—its recruitment and selection priorities,

the competency standards it applies, the skill shortages it records, and the development pathways it provides. The reports are coded against the same five-domain framework (Appendix A), supplemented by demand-side categories that the framework does not capture at the curriculum level—namely competency standardization (the Single Competency Framework), sector-specialist shortages, graduate-entry pathways such as the Presidential Youth Personnel Reserve, in-service development provision, and service-orientation reforms. The documentary corpus is listed in full, with the principal demand-side themes it surfaces, in Appendix B. The reports are official Russian-language documents; relevant passages are translated by the researcher following the protocol in Section 3.3.2, and original-language wording is retained in the audit trail for verification.

The analysis is conducted by the researcher as sole coder. To strengthen credibility, an audit-trail procedure is maintained throughout, including a coding memo that records definitional decisions, ambiguous cases, and revisions. A 20% sub-sample of coded documents is re-coded after a minimum two-week interval to assess intra-coder consistency, and any disagreements between the two coding passes are resolved through review against the framework definitions and recorded in the audit trail.

3.Results

Document Analysis: National Reports on the State of the Civil Service (2018–2024)

Note. This section forms the national, demand-side layer of the document-analysis strand (Section 3.2.1), read alongside the analysis of university curricula and of the OECD policy corpus that follows. Subsection numbering can be aligned to the final chapter structure.

The National Reports on the State of the Civil Service are the authoritative public account of the condition of Kazakhstan's civil service, published annually by the Agency for Civil Service Affairs. Because they record, in the state's own words, the competencies it requires, the shortages it confronts, and the mechanisms it uses to recruit and develop staff, they constitute the central demand-side evidence in this study. Six reports were available and analysed, spanning civil-service activity for 2018 and 2020 through 2024; as each report is issued in the year following the period it covers, the report documenting 2020 is the one published in 2021, and so on. The reports are official Russian-language documents; passages drawn into the analysis were translated by the researcher, with original wording retained in the audit trail. Each report was read in full and coded against the five-domain competency framework (Appendix A), supplemented by the demand-side categories developed for this corpus (Appendix B). The analysis below is organised thematically across the time series rather than report by report, because the analytic value lies in the consistency and movement of the patterns the reports document. This corpus principally informs RQ1 (the competencies the public sector values), RQ2 (specific gaps), and RQ4 (overall alignment).

Table 3 National Reports analysed in the demand-side document analysis.		
Publication year	**Reporting year**	**Document**
2019	2018	National Report on the State of the Civil Service in the Republic of Kazakhstan
2021	2020	National Report on the State of the Civil Service in the Republic of Kazakhstan
2022	2021	National Report on the State of the Civil Service in the Republic of Kazakhstan
2023	2022	National Report on the State of the Civil Service in the Republic of Kazakhstan
2024	2023	National Report on the State of the Civil Service in the Republic of Kazakhstan
2025	2024	National Report on the State of the Civil Service in the Republic of Kazakhstan

A standardised competency requirement: the Single Competency Framework

From the earliest report in the corpus, the state articulates its competency demand in formal terms. The 2018 report records the introduction of a Single Competency Framework (Единая рамка компетенций) that sets out required knowledge, skills, and abilities differentiated for each category of position, assessed during selection through psychometric instruments. Across later reports this apparatus is progressively digitalized: competitive selection is moved into the 'E-qyzmet' information system, with the 2021 report linking full digitalisation of competition procedures to greater transparency and client-orientation, and the 2024 report describing dynamic, digitally enabled recruitment. For this study, the Framework matters because it gives the demand side a concrete, official reference point. It means the question of alignment can be posed precisely—do the competencies universities cultivate correspond to the categories the state itself defines and tests? In coding terms, it maps chiefly to Domains 1 and 2 and to the selection mechanism through which competency demand is enforced.

The attainment paradox and the sector-specialist deficit

The single most important pattern for this study is the coexistence of high formal education with a persistent shortage of the right competencies. The reports consistently record that around 92% of civil servants hold higher education (2018, 2020, 2021, 2022), with roughly three thousand of them graduates of foreign universities by 2020. Yet high attainment does not resolve the state's skills problem. The 2022 report identifies a substantial imbalance between the need for particular categories of specialist and their actual availability *despite* the stable 92% degree-holding share. Survey evidence in successive reports quantifies the shortfall: 58% of respondents report a shortage of staff in sectoral units (2022), rising to 73% (2023) and standing at 64% (2024). The 2023 report

records roughly 7,500 vacant posts, equal to 8.4% of established positions, of which 1,408 (1.6%) had been vacant for more than three months; the 2024 report still counts around 7,000 vacancies.

This is the empirical heart of the demand-side case. The deficit the state documents is not primarily quantitative—a shortage of degree-holders—but qualitative: a shortage of the right specialization and the right competencies among otherwise well-qualified candidates, a mismatch visible since the 2018 report's observation that sectoral bodies struggled to staff roles with appropriately specialized graduates. This directly substantiates RQ2 and frames RQ4: it establishes that a graduate–employer alignment gap exists in the state's own data, and locates it in competency fit rather than credential supply.

Engineering graduate entry: the Presidential Youth Personnel Reserve

The reports show the state actively shaping how graduates enter the service rather than relying solely on open competition. The Presidential Youth Personnel Reserve (ПМКР) recurs across the corpus as a youth-talent pipeline: the 2020 report records 178 reservists placed in posts (59.6% of the cohort), and later reports describe further selection rounds, the formation of regional reserves, the digitalization of reserve selection within E-qyzmet, and consideration of non-competitive appointment routes for high-performing university graduates. For the present study, these pathways are part of the recruitment architecture into which graduates actually move, and they indicate where graduate readiness is most consequential for the state. They map to the employability and skills-ecosystem levels of the framework (Domains 3–5).

Building competencies after entry: the in-service development system

A consistent feature of the reports is the scale of in-service training the state provides, principally through the Academy of Public Administration under the President. The reports record large annual volumes of retraining and upskilling—28,425 civil servants in 2020, 36,027 in 2021, and roughly 25,000 in 2022—alongside master's and doctoral programmes and tracked satisfaction with training quality. The system is being deepened institutionally: the 2023 report sets out the ambition to make the responsible agency a full strategic-HR institution, and the 2024 report records the creation of a dedicated Institute for Human Resource Management (the 'HR Institute') within the Academy, together with an expanded roster of accredited training providers.

This matters for interpreting graduate readiness. The existence of a large, formalized development system means that a substantial share of competency-building occurs after entry, which both cushions entry-level gaps and raises a pointed question for the study: how much of what this system must teach could, and should, be built earlier by universities? The development system maps to Domain 5 and to the employability dimension of the framework.

A shifting competency profile: service orientation and digitalization

Across the time series the reports signal a gradual reorientation of the competencies the service values. Client-orientation is a recurring theme from the 2018 report, which notes that over 60% of citizens perceived agencies as client-oriented while calling for further improvement; the 2020 report frames a shift toward a 'human-centric' model of public administration that involves citizens in decision-making; and 'debureaucratisation and client-orientation' becomes a standing chapter of the report by 2022 and 2024. Running in parallel is a sustained digitalization agenda—of public services and of HR processes and selection alike. Together these trends indicate that the competency profile demanded of public servants is moving toward service-oriented, citizen-facing, and digitally mediated capability. This convergence with the international evidence (notably OECD, 2023) strengthens the analysis; in coding terms it reinforces Domains 2 and 3.

Retention and early-career attrition

Finally, the reports connect entry-level readiness to retention. The 2021 report finds that 72% of those who left the service voluntarily had been in post for less than three years, attributing departures to workload, pay, a mismatch between the work and employees' expectations, and limited prospects for career growth. Early-career attrition concentrated among new entrants implies that weak alignment at the point of entry carries a downstream cost: graduates who find the work poorly matched to their preparation and expectations are those most likely to leave. This does not bear on a single research question so much as it raises the stakes of the alignment problem as a whole, and it provides important context for the recommendations developed later in the study.

Trends across the corpus

Read as a six-year series, the National Reports are strikingly consistent. They show, throughout: a formal, position-differentiated competency standard enforced through increasingly digital selection; a high and stable level of formal educational attainment that nonetheless coexists with a widening, openly reported shortage of suitably specialised and competent staff; a deliberate set of graduate-entry pathways; heavy and growing reliance on in-service development to bring staff to full effectiveness; a competency profile shifting toward digital and service-oriented capability; and early-career attrition concentrated among recent entrants. Taken together, these patterns answer RQ1 by documenting what the state values and demands, evidence RQ2 by quantifying where supply falls short of that demand, and frame RQ4 by establishing—within the government's own data—that the gap is one of competency fit rather than credential quantity.

Implication for the analysis

Taken together, the comparison yields a robust, triangulated standard of demand—a set of competency signals—digital and analytical capability, transferable and socio-emotional skills, continuous-learning capacity, service orientation, and the governance conditions for alignment—on which an internal national account and an external international benchmark independently agree, with each correcting the other's blind spots. In the joint-display integration (Section 3.4), this standard is set against the competency 'supply' coded from university curricula, enabling the study to identify, across the documentary sources, where graduate preparation aligns with public-sector needs and where it does not. The following section presents the curriculum analysis, read against this documentary benchmark.

4. Discussion

This study aimed to explore the alignment between Master's-level public-administration education in Kazakhstan and the competency needs documented for the country's public sector. The analyses were made to draw a line between theoretical background provided by universities and competency demand indicated by the public sector.

The findings specify that the alignment between public administration education and public sector needs remains deficient, although it goes through different development processes. University programs that have been thoroughly analyzed show an increased demand in competency-based educational approaches. Digital transformation and educational reform also deserve special attention. Nevertheless, differences were mentioned between the set of skills included in universities curricula and those required for effective civil service operation.

The discussion argues that the main challenge is converting university-based knowledge into useful competencies for an effective post-graduation employment process. Young public administration specialists are expected to effectively apply their theoretical knowledge via literate communication, critical thinking, adaptability and digital literacy.

Findings from document analysis suggest several insights into public sector expectations from Kazakhstani universities.

Answering the first research question:

What competencies does the documentary record—Kazakhstan's National Reports on the State of the Civil Service and comparative OECD policy reports—identify as required for entry-level public-sector work?

The analysis allows to highlight specific set of skills required by the public sector:

- Digital competencies are among the most important requirements for successful public sector employment. According to the document analysis, the global shift to digitalization turned digital literacy into an essential part of professional public-service competence rather

than an extra technical skill. Employees who can handle digital information, analyze data, maintain digital communication, and help improve administrative procedures are needed for the expansion of e-government and digital public services.

- Communication is also highlighted to be a key expectation for successful workers in the public sector. It encompasses the capacity to interact with other groups, collaborate in teams, negotiate, and modify communication tactics according to the circumstances.
- Service orientation is highlighted as the main focus on ethical behavior and moral values. Employees in public administration are accountable for representing public interests rather than personal objectives.As a result, competencies in integrity, accountability, transparency, responsibility, and knowledge of professional ethics are necessary for public servants. These skills affect the caliber of public services and increase public confidence in governmental organizations.

Further, the curriculum analysis presents the real value of understanding legal frameworks and policies that are present in programmes of universities in Kazakhstan as separate disciplines.

This difference between theoretical and practical knowledge illustrates the gap between traditional educational models and modern complex civil environments. Therefore, the way to evaluate graduate preparation is to judge not the theoretical knowledge but the performance of professional tasks and challenges.

These findings can be explained through Competence Theory, which views competence as a combination of knowledge, skills, behaviours, and personal characteristics that contribute to effective performance. This perspective is relevant for civil services because the effectiveness of governmental structures depends on employer capabilities.

The difference between knowledge and competence becomes visible when a graduate may understand administrative procedures but still experience difficulties when required to negotiate with stakeholders, analyse uncertain situations, communicate policy decisions, or coordinate between institutions.

Therefore, the development of competencies requires practice such as case studies and simulations or even special projects in collaboration with the public sector.

The study also answered the second research question

What gaps between graduate preparation and public-sector competency needs are evident in the documentary and curricular record?

The results indicate that the most significant gaps relate to the development of applicable competences, employer participation, the practical application of theoretical background, and the relationship between academic preparation and public institutions expectations. These results

accurately show that the biggest issue lies within the ability to implement theoretical knowledge into practical experience and ability to implement the skills obtained in university.

The other important aspect identified in lack of internships and supervised professional experience. The academic-practice gap leads to getting qualifications without the ability to successfully enter the workplace without additional professional training.

A further gap explains the limited cooperation between universities and public sector. The Skills Ecosystem perspective explains the idea of interaction between institutions. From this perspective, skills mismatch emerges from insufficient cooperation. Participation in curriculum discussions and providing meaningful internships will contribute to Kazakhstan's public sector by having prepared workers that match labor market expectations.

The curriculum analysis demonstrates that universities that provide public administration programmes have integrated some elements of modern competency-based education. Nevertheless, some areas appear less developed.

This study contributes to existing research by examining both sides of the skill alignment. Previous studies often explained the curriculum content or employer expectations separately. The analysis of two dimensions, this research shows how alignment and mismatch emerge and affect the public sector..

The findings also support international research by emphasizing the value of practical over theoretical knowledge. Simultaneously, the study adds evidence from Kazakhstan, a transitional governance context where educational reform and administrative modernization occurred.

The results suggest that competency alignment requires not only curriculum reform but also institutional cooperation and continuous feedback between education and employment systems.

Overall, the results show that although Kazakhstan's public administration education system has shifted toward competency-based training, the alignment with public-sector expectations remains a challenge.

This study's primary finding is that graduation preparation is influenced by factors other than course content. It revalues communication between public institutions, employers, and universities. Graduates may be better prepared for modern public service if practical learning, employer involvement, and competency-based approaches are properly integrated.

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DISRUPTING THE INSTITUTIONAL STATUS QUO THROUGH A BIMODAL ARCHITECTURAL FRAMEWORK FOR RAILWAY MACRO-SYSTEMS

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ABSTRACT

The global economy is currently navigating a period of unprecedented chaos. Traditional railway networks find themselves caught in a structural trap. They are forced to maintain absolute safety on the tracks, yet they are simultaneously expected to act like agile commercial startups. This paper digs into the institutional limits of the mechanical bureaucracy inside Kazakhstan's national railway operator. By using a qualitative case study approach and benchmarking against World Bank guidelines, I argue that the only real way out of this paralysis is a bimodal organizational architecture. Basically, the system needs to be unbundled. Separating the heavily subsidized infrastructure core from a fast-moving commercial logistics shell disrupts the current, inefficient status quo and builds genuine strategic resilience.

KEYWORDS: strategic resilience, bimodal architecture, organizational design, institutional decoupling.

1 INTRODUCTION

1.1 Macroeconomic Turbulence and the Vulnerability of Logistics Networks

Nowadays, global economic situation has transitioned into an era which is characterized by continuous turbulence and profound nonlinearity. To this end, major transport and logistics systems that serve as the critical infrastructural backbone of national economies around the world, face never seen exposure to external shocks. Traditional corporate risk management approaches, which are historically based on linear projection algorithms and static compliance matrices, demonstrate substantial operational limitations when it comes to mitigating the unpredictable impacts of modern systemic crises (Hubbard, 2009). As defined and described in global guidelines, effective risk management is found to be a dynamic and iterative process, which should create and

protect value in highly uncertain or unpredictable contexts, rather than a static bureaucratic exercise (ISO, 2018). According to the theory of disorder, complex systems that are designed to stabilize volatility anyway accumulate hidden defects. In turn, this often leads to highly fragile structures (Taleb, 2012). Such systemic fragility is considered as an unfavourable asymmetry, where the organization is severely exposed to unanticipated external stress triggers. Therefore, the adherence to a highly centralized organizational architecture within a company, especially, in a national transport monopoly, can no longer guarantee operational safety. In contrast, it actively paralyzes the dynamic capabilities of the organization required for resilient performance and rapid market adaptation (Weick and Sutcliffe, 2007).

1.2 The Phenomenon of Institutional Decoupling in State Monopolies

As it is officially presented in its corporate development strategies, the strategic ambition of the national railway operator is to meet the requirements of the national economy and transform into a highly competitive Eurasian transit and logistics hub. However, this ambition contradicts the company's structural hierarchy, which still relies on a multi-tiered system of corporate control comprising the Board of Directors, the Management Board, and numerous compliance functions. In organizational theory, this contradiction is systematically explained through the phenomenon of institutional decoupling (Meyer and Rowan, 1977). Decoupling occurs when a company's formal structure and strategic facade are purposefully separated from its actual operational core in order to maintain legitimacy in the eyes of its stakeholders. The headquarters remains focused on static risk management and only formal control to prevent operational failures and ensure strict infrastructural safety. Eventually, decoupling paralyzes the commercial logistics units. Consequently, the transit divisions lack the necessary operational autonomy, which results in severe managerial friction and an inability to immediately capitalize on emerging transit opportunities in the global market. This gap between the declared corporate strategy and the mechanistic operational reality severely undermines the organization's overall strategic resilience and reveals an urgent need for a fundamental architectural redesign.

1.3 Research Objectives and Problem Statement

On the one hand, the specificity of the transportation infrastructure requires absolute safety, zero tolerance for errors, and a specialized structural design that allows people to detect and manage the unexpected as early as possible (Weick and Sutcliffe, 2007). Such high-reliability organizations require strong standardization and an intense reliance on technical staff groups to minimize output variance (Mintzberg, 1979). On the other hand, if the organization is aimed at successful competition in the highly volatile transit logistics market, it should implement an organizational flexibility, decentralized decision-making, and rapid resource deployment. An attempt to meet both of these mutually exclusive requirements within a single hierarchy eventually blocks operational efficiency and generates accumulation of internal friction and financial burden.

Therefore, the main objective of this research is to disrupt this institutional status quo by designing and conceptualizing a bimodal organizational architecture.

2 THEORETICAL FRAMEWORK AND METHODOLOGY

2.1 Foundations of High Reliability Organizations and Mechanical Bureaucracy

Railway macro-systems operate under demanding conditions where the potential cost of systemic error is catastrophic. Therefore, they need to be developed into highly centralized administrative structures. According to Mintzberg (1980), such organizations adopt the configuration of a Machine Bureaucracy with highly formalized operating work, loads of rules, and concentrated decision-making power at the strategic issues. However, this architectural configuration is effective for minimizing variance in stable environments only. And it becomes a severe structural burden during periods of external turbulence. The need for managing the unexpected requires the compliance with the principles of High Reliability Management.

2.2 Qualitative Case Study Design and Institutional Benchmarking

To overcome the asymmetry associated with large state-owned enterprises, this research applies a qualitative case study design combined with the method of scientific data triangulation (Schindler, 2018). The empirical foundation is based on publicly available integrated annual reports of the national railway operator. Furthermore, institutional benchmarking is used as the main analytical tool. Having evaluated the internal architectural constraints of the macro-system against established global transformation patterns, the research ensures that the proposed organizational design resides in verifiable empirical data, not abstract theoretical assumptions.

2.3 Global Patterns of Railway Transformation

The conceptualization of the bimodal architecture is strongly supported by the evolution of leading international logistics operators. For instance, the operational models of Canadian National demonstrate that strategical separation of the core infrastructure maintenance from agile freight operations allows for more efficient capital allocation and enhanced technological integration in the transit sector. Similarly, the structural evolution within the Deutsche Bahn Group illustrates the strategic necessity of distinguishing between state-subsidized infrastructure networks and autonomous, market-driven logistics subsidiaries.

3 CONCEPTUALIZING THE BIMODAL ORGANIZATIONAL ARCHITECTURE

3.1 The Imperative of Structural Unbundling

The qualitative synthesis of the empirical data and the theoretical framework demonstrates that the monolithic architecture of the national railway operator is structurally incapable of executing infrastructural maintenance and commercial expansion. To resolve the institutional decoupling diagnosed in the preceding sections, the macro-system must undergo a fundamental architectural redesign. Based on the theory of dynamic capabilities, an organization must possess the inherent capacity to integrate, build, and reconfigure internal competencies to address ever changing global environments (Teece, 2007). However, attempts to cultivate such dynamic capabilities within a traditional Machine Bureaucracy inevitably generates significant managerial friction, as the administrative apparatus is initially designed to suppress deviations and enforce standardization. Therefore, the optimal scientific solution to ensure long-term strategic resilience is the institutional separation, or unbundling, of the organization's conflicting functions. As it is described in global railway reform methodologies, structural unbundling makes it possible to isolate distinct operational objectives, prevent systemic inefficiencies and eliminate the administrative friction caused by competing corporate cultures. Through a transition to a bimodal organizational architecture, the macro-system is deliberately divided into two independent, yet symbiotic, operational contours. This strategic separation allows to harmonize the state's requirements for infrastructural safety with the global market's demand for commercial agility.

3.2 Designing the Infrastructure Core for Absolute Reliability

The first contour of the bimodal architecture, defined as the Infrastructure Core, includes the national railway network, heavy traction assets, and station complexes. This fundamental entity must remain under strict state control and subsidization, and operate according to the principles of a High Reliability Organization (Rochlin et al., 1987). Its strategic objectives are minimizing operational failures, ensuring absolute infrastructural safety, and executing long-term capital investments in asset modernization. Thi contour preserves the classical elements of a Machine Bureaucracy, compliance procedures and centralized risk management protocols (Mintzberg, 1979). Such isolation of these heavy assets from market volatility guarantees uninterrupted functioning of the major transport backbone.

3.3 Developing the Commercial Shell for Agile Market Adaptation

The second contour, designated as the Commercial Shell, represents the transit and logistics business units functioning within the competitive global market. Once liberated from the bureaucratic compliance requirements of the infrastructure core, this entity is structurally designed to operate with maximal strategic autonomy. The organizational architecture of the Commercial Shell must incorporate principles of dynamic capabilities and lean management, focusing exclusively on customer satisfaction, immediate resource deployment, and the maximization of high-margin transit revenues (Teece, 2007). Due to decentralized decision-making authority, this agile unit can smoothly adapt to the nonlinear fluctuations and uncertainties of the Eurasian logistics market (Taleb, 2012). Finally, this structural decoupling allows the commercial shell to

capture external economic value without exposing the stability of the underlying national infrastructure to risks.

4 CONCLUSION AND IMPLICATIONS

This study conceptually proves that the implementation of a bimodal organizational architecture is not only an administrative optimization, but a critical condition for the strategic survival of railway macro-systems. By unbundling the state monopoly into distinct operational contours, the proposed framework effectively eliminates the diagnosed institutional decoupling (Meyer and Rowan, 1977). Furthermore, the research contributes to the broader strategic management discourse by providing a pragmatic architectural solution for mitigating the impact of external turbulence. Development of robust dynamic capabilities within a commercial shell, while protecting the infrastructure core, allows the enterprise to achieve its long-term strategic objectives (Teece, 2007). It actively prevents the accumulation of hidden structural vulnerabilities, enabling the macro-system to transform into a truly antifragile entity capable of surviving in highly unpredictable environments (Taleb, 2012).

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ASSESSMENT OF THE SMPACT OF A VAT RATE INCREASE ON KAZAKHSTAN'S TAX POTENTIAL

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ABSTRACT

Purpose: This study evaluates the impact of value-added tax (VAT) rate changes on Kazakhstan's macroeconomic indicators, including tax revenues, GDP, and the shadow economy. Given the country's 3.2% budget deficit (2023) and frequent tax law amendments, assessing VAT's effectiveness is crucial.

Research methodology: The study employs econometric analysis, including regression modeling and elasticity estimation, to assess VAT's impact on tax revenues. Two periods are analyzed: one with a variable VAT rate and the other with a stable 12% VAT rate. Scenario forecasting evaluates potential VAT policy outcomes.

Findings: The results indicate that GDP fluctuations significantly impact tax revenues, whereas VAT rate changes have an insignificant effect. This confirms that economic growth, rather than tax rate adjustments, is key to revenue generation.

Research limitations: The model does not account for intersectoral effects or long-term dynamic responses. Future research should incorporate sectoral analysis and dynamic modeling.

Practical implications: The findings assist policymakers in assessing VAT changes and improving fiscal policy planning.

Originality/Value: This research provides a simplified yet effective approach for evaluating

tax policy in Kazakhstan, bridging theoretical models and practical applications.

KEYWORDS: Value-added tax (VAT), tax potential, tax reform, fiscal policy, Kazakhstan, budget revenues, tax capacity, economic impact

INTRODUCTION

In the context of the current economic situation in Kazakhstan—marked by a significant budget deficit—questions of optimizing tax policy have taken on particular urgency. According to data from the Ministry of National Economy of the Republic of Kazakhstan, the country's state budget deficit stood at approximately 3.2% of GDP at the end of 2023, highlighting the need for effective strategies to increase budget revenues.

The importance of this study is further underscored by frequent changes to Kazakhstan's tax legislation, which are often enacted without in-depth economic analysis or thorough impact assessments. This is exemplified by the numerous amendments to the Tax Code: over the past five years alone, dozens of revisions have been introduced to adjust tax rates and collection methods.

An increase in the VAT rate, discussed as part of a new tax reform, has sparked extensive debate among economists and policymakers. The lack of robust economic models and calculations capable of accurately forecasting the effects of such decisions leads to high risks of adverse outcomes for both the economy and social stability.

In this regard, the development of a clear and straightforward methodology for assessing how changes in tax legislation—particularly VAT—affect key macroeconomic indicators is both timely and essential. The model proposed in this article aims to fill these gaps and enhance the quality of policy decisions within Kazakhstan's tax framework.

LITERATURE REVIEW

The Role and Impact of VAT on Tax Potential and Budget Revenues

Historically, value-added tax (VAT) has been regarded as one of the most efficient and universal forms of indirect taxation. In many developing countries, its role has significantly expanded over recent decades, owing to its relatively high revenue-generating capacity, broad tax base, and neutrality toward business activities (Tait, 1988). Beyond its contribution to budget revenues, VAT also influences the broader concept of "tax capacity," that is, a government's ability to mobilize the fiscal resources needed over the long term (Fenochietto & Pessino, 2013).

VAT is levied on the added value at each stage of production and distribution of goods and services; compared to traditional turnover taxes, this mechanism reduces the cumulative effect of tax payments (Ebrill et al., 2001). By mitigating double taxation and distortions in supply chains, VAT can lead to a more efficient distribution of resources. In developing countries, its introduction is often accompanied by the optimization or elimination of other indirect taxes (e.g., excise taxes

or trade fees), resulting in a more integrated tax system (Bird & Gendron, 2007). VAT can cover a wide range of transactions—goods, services, and imports—thus broadening the taxpayer base and enhancing the transparency of the fiscal system.

VAT's effectiveness hinges on the sophistication of the tax administration, the clarity of the legal framework, and the rigor of oversight (Bird & De Jantscher, 1992). In countries plagued by a large informal sector and pervasive corruption, risks of under-collection persist, diminishing VAT's overall fiscal impact (Aizenman & Jinjarak, 2008).

Compared with direct taxes, VAT tends to exhibit relatively high elasticity, as consumption in developing economies generally grows in tandem with rising income levels (Keen & Lockwood, 2010). However, consumption patterns can be uneven, and failing to account fully for the shadow economy and informal sectors reduces VAT's effective elasticity (Aizenman & Jinjarak, 2008).

A reliable stream of VAT revenues can help narrow the budget deficit and reduce reliance on external financing sources. According to various authors (Le et al., 2012; Fenochietto & Pessino, 2013), one of VAT's defining strengths is its ability to encompass a broad spectrum of economic activities, thereby spurring the formalization of businesses and contributing to an overall increase in "tax capacity." Over the long term, the gradual formalization of the economy facilitated by VAT—through mechanisms such as tax offsets and reporting—can also improve collection in other tax categories.

By its very design, VAT fosters close relationships between suppliers and buyers, which improves record-keeping, accounting practices, and mutual oversight. As the share of formal transactions grows, the tax base expands and institutional frameworks are strengthened (Keen & Lockwood, 2010). Accordingly, VAT can act as a "transition bridge" toward developing a more transparent fiscal system, thereby boosting overall tax-collection capacity.

Nevertheless, introducing or raising VAT rates can spark public concern about price inflation and provoke significant political debate (Bird & Gendron, 2007). Governments must consider social factors, including the provision of targeted compensations for low-income populations. Such measures ultimately preserve the tax's legitimacy and reinforce the stability of budget revenues.

Over time, the concept of "tax potential" has broadened to include structural factors and contextual conditions in a given region or country. New approaches have emerged that examine not only economic but also institutional, social, and legal aspects (e.g., the availability of investment infrastructure, the digitization level of tax administration, and the degree of shadow economic activity).

Table 1. Overview of Key Approaches to Tax Potential Assessment

Approach	The essence of the approach	Methods	Conclusions

Resource-based approach	Identification and analysis of the resource base that can generate tax revenues	Assessment and analysis of the volume of manufactured goods, economic structure, and investment climate.	Without taking into account organizational and institutional factors, the assessment turns out to be too aggregated; it is difficult to take into account the actual collection of taxes and the influence of the shadow sector.
Macroeconomic approach	Based on the use of aggregated macroeconomic indicators	Statistical models (regression equations, balance equations) for establishing relationships between macro-indicators and actually collected taxes.	Relative simplicity of constructing forecast models. Error is possible due to heterogeneity of regions, as well as due to the influence of illegal or semi-legal economic activity.
Structural (industry) approach	Assesses tax potential through the prism of the sectoral structure of the economy. For example, for industrially developed regions	Analysis of potential tax revenues by leading sectors (mining, manufacturing, energy, etc.).	Convenient for point forecasting: you can separately model the potential of key industries and combine the results into a general assessment. Difficulty in taking into account inter-industry connections and the dynamics of technology development (for example, digitalization or the emergence of new industries).
Comparative approach	Comparison of tax indicators of the region or country under study with a “standard” territory that is similar in economic structure, population size and other parameters.	Assess whether there are reserves for increasing tax collection by identifying gaps with comparable regions	A correct selection of regions for comparison (similar socio-economic conditions) is required, as well as a detailed analysis of the reasons for deviations.

Model and integrated approaches	Modern authors propose to combine several methods in a single model. These can be multivariate regression models, variations based on production functions, factor models, index methods, etc.	Take into account the widest possible set of parameters (economic, social, institutional) in order to get closer to a "realistic" assessment of tax potential.	Higher forecast accuracy, the possibility of scenario modeling (optimistic, baseline, pessimistic scenarios). High complexity of data collection, the need for regular updating of the methodology and consideration of the correlation of factors.

Modernization of the Tax System and the introduction of new amendments must be grounded in a thorough justification of their fiscal productivity, future consequences, and administrative feasibility. The complexity of tax-policy justification calls for the use of an appropriate planning and assessment framework to evaluate the impact on tax potential. Absent such an evaluation, implementing changes in tax regulation may become one of the root causes of long-term budget deficits and an erosion of the tax base.

The quality of well-substantiated tax decisions is reflected in a balanced budget and the frequency of tax legislation revisions. Scholars note that Kazakhstan's tax legislation has been amended at a high rate. From 2009 to 2015, the Tax Code underwent changes through 111 separate laws—an average of 16 laws per year—with a total of 2,314 amendments. Frequent modifications to tax regulations hinder business activity and deter investment.

Table 2. Amendments and Additions to the Tax Code, 2009–2015

Year	Number of laws	Number of amendments	Number of norms retrospectively
2009	8	381	164
2010	12	205	36
2011	15	280	49
2012	20	359	51
2013	13	201	56
2014	18	386	52
2015	25	502	22
Summary	**111**	**2314**	**430**

On the other hand, this trend of frequent amendments to tax legislation may also signal a lack of systematic long-term planning in budgeting and socioeconomic policy. Tax reforms and adjustments are often undertaken without a thorough examination of potential repercussions, frequently aiming to address short-term or transitory economic challenges. Although comprehensive, systemic reforms are needed to ensure long-term impact, many of the recent changes to the tax code have instead been reactive and narrowly focused.

In many developing countries, VAT is seen by researchers as an effective instrument for increasing government revenue and expanding tax potential. Because of its broad tax base, the built-in "self-monitoring" mechanism between economic agents, and its elasticity with respect to changes in consumer demand, VAT can provide a stable revenue flow and encourage the formalization of the economy. However, its successful implementation largely depends on institutional factors, the quality of tax administration, and the level of transparency in economic transactions.

Taken together, prior studies suggest that a well-designed and effectively administered VAT can bolster a country's or region's "tax potential," strengthen fiscal sustainability, and create favorable conditions for further financial system development. Yet a comprehensive approach is required—ranging from adapting tax legislation to local contexts and refining tax administration practices to designing social and economic measures that mitigate the potentially regressive nature of the tax.

RESEARCH METHODS

Data Sources

Historical Data on VAT, GDP, and Tax Revenues (2000–2023). Collected from official statistical reports and government agencies.

Tax-Revenue Elasticity. Estimated on the basis of actual changes in tax revenues under different VAT rates.

Macroeconomic Indicators. Consumption, investment, and shadow-economy data were sourced from national statistics and international reports.

Previous Research. Theoretical models of tax elasticity and the economic impact of taxation (Atkinson & Stiglitz, 1976; Keen & Lockwood, 2010) were also utilized.

Research Stages

2.1. Data Collection and Processing

Data on VAT revenues, GDP, and tax rates from 2000 to 2023 were compiled. Since Kazakhstan's VAT rate has remained at 12% since 2009, capturing a period with different rates was essential for a more precise calculation of VAT-based tax-revenue elasticity. Therefore, the dataset was divided into two periods: 2000–2005 (variable VAT rate) and 2014–2023 (fixed 12% VAT rate). Indicators were then standardized (through log transformations and annual indexing).

2.2. Calculation of Tax-Revenue Elasticity

The following elasticity formula was employed:

$$\eta_T = \frac{{}^{0}/_{0}\Delta T}{{}^{0}/_{0}\Delta VAT} \qquad (1)$$

where,

n_T – elasticity of tax revenues,

ΔT – change in VAT receipts,

ΔVAT – change in VAT rate.

Elasticity is calculated in two key periods in Table 3.

Table 3. Results of elasticity calculation in two key periods

Periods	Change in VAT rate	Elasticity of tax revenue n_T
2001-2002	VAT: 20% → 16%	-0,5
2004-2005	VAT: 16% → 15%	-2,08
2014-2023	stable rate 12%	1,72

Average elasticity is found, taking into account all periods.

Calculation of GDP elasticity by VAT (η_GDP)

$$\eta_{GDP} = \frac{\%\Delta\text{GDP}}{\%\Delta\text{VAT}} \quad (2)$$

2.3. Forecasting tax revenues when VAT changes

Model used:

$$Tnew = Tbase * \left(1 + \eta_T * \frac{\Delta VAT}{VATbase}\right) \quad (3)$$

The forecast was made for VAT of 15%, 18% and 20%. It was found that with an increase in VAT, tax revenues may increase slightly or even decrease, which indicates a possible reduction in the tax base.

2.4. Impact on GDP, consumption and shadow economy

The following empirical elasticity coefficients were used for the assessment:

Impact on GDP: In the period 2000-2005, the elasticity of VAT on GDP η_{GDP} = -0,81, and in the period 2014 – 2023 года η_{GDP} = -4,69.

The average elasticity of GDP to VAT was -2.75, which means that with a 1% increase in VAT, GDP could decrease by 2.75%.

For the forecasts, typical elasticity values from other studies were used: Impact on consumption: $\eta_C = -0.35$ (Gemmell & Hasseldine, 2012) the study was conducted to assess the impact of indirect taxes on demand.

Impact on the shadow economy: $\eta_{informal} = 0.25$ based on Bird & Gendron (2007), who studied the impact of VAT on the movement of businesses into the shadows (Bird & Gendron, 2007).

2.5 Econometric analysis of the impact of VAT on tax revenues

To test the impact of VAT, GDP and the shadow economy on tax revenues, a multiple linear regression model was constructed, which has the following form:

$$\ln T = \alpha + \beta_1 \ln VAT + \beta_2 \ln GDP + \beta_3 \ln Informal + \epsilon \qquad (4)$$

где,
T – VAT tax revenues,
VAT – VAT rate,
GDP – GDP,
$Informal$ – level of shadow economy,
$\beta_1\ \beta_2\ \beta_3$ – elasticity coefficients.

RESULTS

VAT Rate Dynamics in Kazakhstan Over Two Periods: 2000–2005 and 2014–2023

During the 2000s, Kazakhstan's VAT rate underwent a significant reduction, likely intended to stimulate economic activity and lower the tax burden on businesses.

Since 2014, the VAT rate has been held at 12%, highlighting the stability of recent tax policy.

From 2000 to 2005, the gradual decline in VAT made it possible to trace the effects of tax reforms on the economy.

Between 2014 and 2023, the tax system functioned without any change to the VAT rate, offering an opportunity to assess the long-term effects of a stable tax burden in Figure 1.

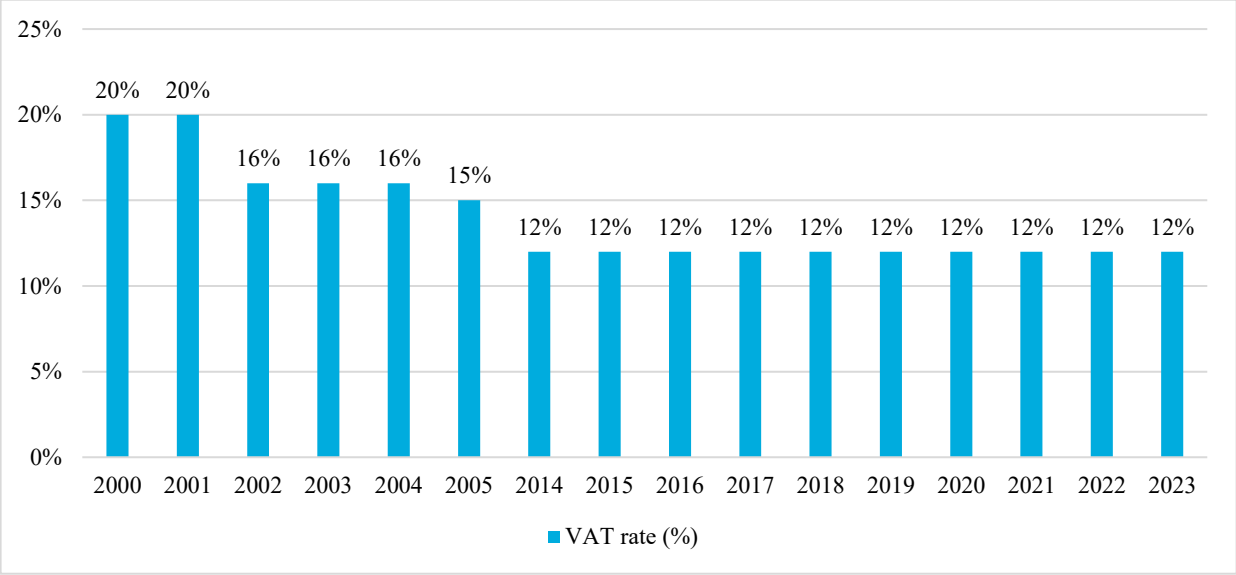


Figure 1. Dynamics of VAT rate changes in the periods 2000–2005 and 2014–2023 (Mybuh.kz. 2021)

Table 4. Dynamics of the main macroeconomic indicators in Kazakhstan

Year	VAT rate (%)	VAT revenues (billion KZT)	GDP (KZT billion)	Shadow economy (%)
2000	20	115,15	2559	-
2001	20	159,9	3250	-
2002	16	175,9	3776	-
2003	16	208,5	4612	-
2004	16	276,5	5870	-
2005	15	312,4	7590	-
2014	12	1200	39676	28,06
2015	12	970	40884	27,51
2016	12	944,4	46971	25,84
2017	12	1500	54379	28,75
2018	12	1730	61820	27,02
2019	12	2700	69533	23,69
2020	12	2500	70649	20,23
2021	12	2800	83952	19,75
2022	12	4200	103766	18,78
2023	12	5700	119442	17,52

Regression Analysis Results

An examination of the regression model reveals that approximately 94.6% of the variation in tax revenues is explained by the model (R-squared = 0.946). The adjusted R-squared of 0.930 further underscores the model's robustness, indicating that the additional variables meaningfully enhance its explanatory power. Both the F-statistic (60.74) and its corresponding probability (3.77e-05) confirm that the null hypothesis—stating all coefficients are zero—can be rejected, underscoring the overall significance of the model.

β_1 (VAT rate): An increase in the VAT rate by 1% is associated with a 3.53% drop in tax revenues; however, the result is statistically insignificant ($p = 0.183$).

β_2 (GDP): A 1% increase in GDP correlates with a 1.52% rise in tax revenues, and this coefficient is statistically significant ($p = 0.003$).

β_3 (shadow economy): Although the coefficient is slightly negative, it is statistically insignificant ($p = 0.850$).

Overall, the analysis demonstrates that GDP is the key determinant of growth in tax revenues, while the impact of the VAT rate is statistically insignificant. This finding suggests that Kazakhstan's tax base is less sensitive to changes in the VAT rate than to broader economic growth.

Two additional scenarios further illuminate the potential effects of raising the VAT rate:

At a 20% VAT rate, GDP declines by 20%, consumption falls by 21.7%, and the shadow economy rises to 20.6%.

At a 15% VAT rate, GDP declines by 12.7%, consumption by 16%, and the shadow economy increases to 19.1%.

DISCUSSION

Kazakhstan is currently contending with a budget deficit, a factor that has prompted the development of new tax reforms. However, such reforms often proceed on a piecemeal basis, necessitating frequent changes to tax legislation. The availability of effective tools for evaluating the macroeconomic implications of these reforms would enable the formulation of more precise, long-range tax-policy decisions.

A core objective of this study was to devise a simplified model to assess how changes in tax legislation, particularly VAT increases, influence the national economy. By employing econometric techniques and elasticity calculations, this research evaluates how shifts in the VAT rate affect tax revenues, GDP, and the shadow economy.

Previous scholarship offers several insights into the complexities of VAT. Atkinson and Stiglitz (1976) argue that raising VAT in economies with a sizable informal sector can lead to lower tax revenues. Keen and Lockwood (2010) demonstrate that the elasticity of tax revenues can shift over time depending on how effectively tax administration is carried out. Boccanfuso et al. (2011) note that beyond a certain threshold, higher VAT rates stimulate tax evasion, while Bird and Gendron (2007) show that elevated VAT rates in developing economies may increase the tax gap and expand the informal sector.

Compared with earlier research (e.g., Atkinson & Stiglitz, 1976; Keen & Lockwood, 2010; Bird & Gendron, 2007), the methodology presented here offers the following advantages:

Model Simplicity and Applicability. Our model relies on a straightforward supply-and-demand framework, enabling rapid evaluations of potential tax-policy changes.

Focus on Kazakhstan's Context. While most international research addresses tax reforms in developed countries, this study is tailored to Kazakhstan's distinct economic conditions.

Use of Multiple Methods. Instead of adhering to a standard CGE (Computable General Equilibrium) approach, this research combines regression analysis, elasticity estimation, and scenario forecasting.

Despite these strengths, certain limitations exist:

Lack of Intersectoral Analysis. The study is based on macroeconomic aggregates and does not incorporate industry-level effects.

Absence of a Dynamic Component. Unlike DSGE models, this framework does not consider the long-term impacts of tax changes over multiple periods.

The study's findings do not validate the primary hypothesis that "changes in the VAT rate significantly affect tax revenues and economic growth in Kazakhstan." While the VAT rate coefficient is negative, it is statistically insignificant ($p = 0.183$), implying that variations in the VAT rate alone do not substantially influence tax revenues or economic expansion.

Conversely, the alternative hypothesis—namely, that "changes in the VAT rate do not exert a significant influence on tax revenues, and that GDP is the main factor determining tax potential and economic growth"—is confirmed by the analysis. The effect of GDP on tax revenues is both positive and statistically significant (coefficient = 1.5194, p = 0.003). In other words, economic growth itself, rather than the VAT rate, is the principal driver of the country's tax potential.

Raising the VAT rate without implementing complementary measures to stimulate economic growth does not lead to a meaningful improvement in the nation's tax potential. Stimulating overall economic expansion and developing productive capacity are more effective means of boosting tax revenues. Frequent changes in tax legislation, undertaken without analyzing their economic implications, are inefficient and fail to produce the anticipated fiscal gains. It is therefore crucial to develop and employ simplified, transparent models—such as the one proposed here—to guide evidence-based and more effective tax policymaking in Kazakhstan.

CONCLUSIONS

The elasticity of tax revenues varies with each period, highlighting the importance of accounting for historical shifts.

Raising the VAT rate above 15% reduces GDP and consumption, potentially undermining the effectiveness of such tax reforms.

VAT rates of 18–20% can drive an expansion of the shadow economy, thereby shrinking the tax base.

The proposed methodology can be applied to assess tax potential in other countries with similar economic conditions.

The approach used here not only gauges how altering the VAT rate affects Kazakhstan's economy but also enables forecasting the possible outcomes of various tax reforms. These methods can be adapted for further research and for testing alternative tax-policy scenarios.

Recommendation: Future studies could explore how different economic sectors respond to VAT rate adjustments and include additional variables, such as international tax flows and consumption elasticity across diverse social groups.

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The Association Between Advertising Language Preferences and Consumer Brand Goodwill among Gen Z in Astana and Almaty

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ABSTRACT

This paper reports a pilot study of how the language of digital advertising (Kazakh versus Russian) relates to brand goodwill among Generation Z consumers in Almaty and Astana, and whether dominant language identity moderates that relationship as a form of linguistic congruence. Grounded in research on language effects in advertising and in signaling theory, the study proposes a within-person survey design in which each respondent recalls and evaluates one brand encountered mostly in Kazakh and one encountered mostly in Russian, so that advertising language operates as a within-subject factor and brand goodwill can be compared within the same person. The purpose of the pilot is not to confirm the congruence hypotheses but to test whether the proposed design and recruitment strategy can produce the data such a test would require, to evaluate the questionnaire, and to surface preliminary patterns ahead of a larger main study. A bilingual online questionnaire was administered to Gen Z social media users; 35 responses were collected and 29 retained after eligibility screening. Preliminary findings show very high goodwill-scale reliability, an informative divergence between language proficiency (higher for Russian) and language identity and emotional attachment (higher for Kazakh), and a gap between roughly balanced language preferences and a Russian-skewed perceived advertising environment. Critically, only about a third of respondents could name a language-specific brand, so most goodwill ratings were left unanchored and the within-person congruence contrast could not be computed validly. The pilot therefore establishes the design's feasibility requirements and identifies concrete instrument and recruitment refinements for the main study.

KEYWORDS: advertising language; brand goodwill; linguistic congruence; language identity; Generation Z; Kazakhstan; within-person design; pilot study

1 INTRODUCTION

Language is a central element of advertising communication, especially in digital environments where consumers encounter brand messages on a daily basis. In social media advertising, language is not only a channel for delivering information but also a symbolic resource that conveys meanings related to identity, emotion, and cultural belonging. Multilingual advertising research has consistently shown that language choice can shape how consumers

interpret marketing messages, evaluate brands, and form attitudes toward products and services (Kelly-Holmes, 2005; Hornikx et al., 2013). As Instagram and TikTok have become dominant spaces for marketing communication, understanding how advertising language relates to consumer brand evaluations has become increasingly important. These effects are particularly salient in bilingual and multilingual societies, where languages carry distinct symbolic, emotional, and social meanings. Advertising in a consumer's native or emotionally dominant language is often processed more fluently and perceived as more authentic and credible, while non-dominant or high-status languages may signal modernity, prestige, or cosmopolitan orientation (Koslow et al., 1994; Puntoni et al., 2009).

At the same time, bilingual consumers do not respond uniformly to advertising language; their reactions depend on proficiency, linguistic identity, emotional attachment to particular languages, and the social meanings those languages carry (Luna and Peracchio, 2005; Noriega and Blair, 2008). This body of work points to a congruence logic: advertising tends to be evaluated most favourably when the language in which it is encountered matches the consumer's dominant linguistic orientation.

Kazakhstan offers a particularly valuable context for examining these dynamics. Kazakh and Russian coexist as socially significant languages but often carry different symbolic and cultural associations: Kazakh is frequently linked to national identity, authenticity, and cultural belonging, whereas Russian remains strongly associated with urban life, education, media consumption, and cosmopolitan orientation, especially among younger generations (Smagulova, 2008; Koptleuova et al., 2023). Generation Z consumers in Almaty and Astana are exposed to branded content in both languages on Instagram and TikTok, yet it remains unclear how encountering advertising in Kazakh versus Russian relates to brand trust, credibility, emotional attachment, and perceived reputation, and whether these relationships depend on dominant language identity.

1.1 Research Problem and Purpose

Although Kazakh and Russian are both widely used in digital advertising in Kazakhstan, there is limited empirical evidence on how the language in which advertising is encountered relates to brand goodwill among Gen Z consumers, and on whether that relationship depends on the match between advertising language and the consumer's dominant language. The congruence logic that the literature implies has not been tested in this setting, particularly for Instagram and TikTok. A confirmatory test, however, depends on methodological conditions — a within-person measurement that works as intended, a sample balanced across identity groups, and goodwill ratings anchored to genuinely recalled, language-specific brands — whose feasibility is itself unknown. The problem this study addresses, as a pilot, is therefore twofold: whether the proposed design can produce data capable of testing congruence, and what the preliminary data suggest about the constructs and their relationships.

The purpose of this pilot study is to evaluate the feasibility and performance of a within-person survey design intended to test linguistic congruence between advertising language and consumer language identity, and to generate preliminary descriptive evidence to inform a

subsequent main study. Throughout, a distinction is drawn between advertising language (the language advertisers actually use), treated as the primary mechanism, and advertising language preference (the language consumers say they prefer), measured as a related disposition.

1.2 Aims and Research Questions

The pilot pursues three feasibility- and instrument-focused aims. Aim 1 (feasibility) assesses whether a purposive online recruitment strategy can reach Gen Z consumers in Almaty and Astana in adequate and balanced numbers, and in particular whether Kazakh-dominant respondents can be recruited sufficiently. Aim 2 (instrument) evaluates the within-person dual-brand goodwill instrument: the reliability of the goodwill scale, and the rate at which respondents can recall and name a brand encountered in Kazakh and in Russian — the anchoring rate that determines whether the congruence contrast is computable. Aim 3 (preliminary patterns) describes the distribution of language identity, the relationship between stated preference and perceived exposure, and the preliminary direction of the within-person goodwill contrast.

These aims serve the substantive research questions the main study will answer. RQ1: How does the language in which Gen Z consumers encounter brand advertising (Kazakh vs. Russian) relate to brand goodwill? RQ2: How does dominant language identity moderate that relationship — is the goodwill advantage of a language greatest when it matches the consumer's dominant language? RQ3: How do consumers' advertising-language preferences relate to the language they perceive they encounter in advertising?

The study is significant both academically and practically. Academically, it contributes to research on multilingual advertising, consumer behaviour, and digital marketing in a post-Soviet bilingual setting that differs from the contexts in which most language-in-advertising research has been conducted, and it makes a methodological contribution by developing a within-person congruence design and demonstrating, through a pilot, what that design requires to succeed. Practically, brands operating in Kazakhstan make daily decisions about which language to use in social media campaigns aimed at Gen Z, often without evidence on how those decisions are received; even at the pilot stage, the study begins to map consumers' language preferences against the advertising environment they perceive. The scope is deliberately delimited: the study concerns social media advertising in Kazakh and Russian among consumers aged 18–25 in Almaty and Astana who use Instagram or TikTok, and brand goodwill is operationalised as a composite of trust, credibility, emotional attachment, and reputation rather than as broader outcomes such as purchase intention. As a pilot, the study evaluates design feasibility and produces preliminary description; it does not test the congruence hypotheses inferentially, and its small, purposive sample is not intended to support generalisation.

2 LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1 Advertising Language and Linguistic Congruence

Language in advertising is at once informational and symbolic. Beyond conveying product information, the choice of code carries social meaning and positions a brand culturally (Kelly-Holmes, 2005). A foreign or secondary language can act as an implicit cue to prestige or modernity, whereas the local or dominant language is processed more fluently and read as more familiar and authentic (Koslow et al., 1994). Studying bilingual consumers in India, Krishna and Ahluwalia (2008) found asymmetric language effects: the choice of advertising language affected effectiveness for multinational corporations but not for local firms, with Hindi evoking belongingness and English evoking cosmopolitanism.

Findings of this kind establish advertising language as a substantive marketing variable and locate the effect in the relationship between the language, the consumer, and the product rather than in any single one of them. Across this body of work, the mechanism that best organises the findings is congruence — a match between the advertising language and a relevant reference point such as the product, the medium, or the consumer's dominant language. At the product level, Hornikx et al. (2013) showed that foreign-language display is more effective for products congruent with the language's country image (for example, French for wine) than for incongruent products (for example, French for beer). At the consumer level, native-language messages are processed more fluently and experienced as more emotional: across five experiments with bilingual and trilingual Europeans, Puntoni et al. (2009) found that marketing slogans in a consumer's native language were perceived as more emotionally intense than the same slogans in a second language, an effect they trace not to language stereotypes or comprehension difficulty but to the frequency with which words have been experienced in native- versus second-language contexts.

Research on code-switching adds nuance to the congruence account. Luna and Peracchio (2005) demonstrated a code-switching direction effect, in which slogans switching from a minority to a majority language were more persuasive than the reverse — an effect attributable to the salience of the switched word, and one that reversed when associations toward the minority language were positive. Noriega and Blair (2008) showed that the language of an advertisement shapes the very content of consumers' thoughts, so that the same message cues different associations depending on whether it is presented in the native or the second language. Taken together, these studies imply that advertising language operates less as a uniform main effect than through its fit with the consumer's linguistic orientation. This is the congruence logic the present study adopts, and it is what motivates a within-person, identity-moderated design rather than a simple comparison of languages.

2.2 Brand Goodwill and Language Identity

Brand goodwill, the focal outcome, denotes favourable consumer evaluations of a brand and is conceptualised here as a composite of brand trust, perceived credibility, emotional attachment, and perceived reputation. Brand trust — confidence in the brand's reliability and integrity — is a

well-established antecedent of loyalty and performance (Chaudhuri and Holbrook, 2001). Perceived credibility, grounded in a signalling perspective, concerns the believability of a brand's claims and its perceived ability and willingness to deliver on them (Erdem and Swait, 2004). Emotional attachment and reputation derive from broader customer-based brand-equity frameworks (Keller, 2013). Together these capture the trust- and affect-based response that advertising language is theorised to influence. Brand goodwill is conceptually adjacent to but distinct from brand attitude, loyalty, and equity; it isolates the evaluative dimensions most likely to be sensitive to advertising language and is well suited to a digital context of short, repeated exposures that shape attitudes more than immediate behaviour. Measuring goodwill multidimensionally rather than with a single item guards against mistaking one facet of attitude for the broader evaluative response, and whether the four sub-dimensions are empirically separable in a particular population is an open question that the present pilot is able to address.

Language identity — the degree to which individuals identify with and habitually use a particular language — conditions how consumers interpret advertising. Bilinguals do not respond uniformly to language; their reactions depend on proficiency, the emotional weight of each language, and its social meaning (Luna and Peracchio, 2005; Puntoni et al., 2009). Social Identity Theory (Tajfel and Turner, 1979) helps explain why: language is a salient marker of group membership, so an advertisement in one's in-group language can signal shared identity independently of its informational content. Because identity is multidimensional, its components need not coincide — a consumer may be more proficient in one language yet more emotionally attached to another — which is why language identity is best treated as a measured moderator captured with several indicators rather than a single self-label.

2.3 Generation Z and Kazakhstan's Bilingual Environment

Generation Z has grown up with pervasive digital technology and forms brand perceptions largely through social media; the cohort is reported to be innovation-oriented and sensitive to authenticity and cultural relevance (Priporas et al., 2017), making language cues particularly salient. Kazakhstan's contemporary bilingualism is the product of a specific post-Soviet trajectory. Dave (2007) traces how independent Kazakhstan reworked Soviet-era ethnic categories into nation-building, enshrining Kazakh as the state language while Russian retained broad practical currency. Smagulova (2008) documents both the rising status of Kazakh and the continued role of Russian as the language of inter-ethnic communication. Fierman (2006) highlights the particular difficulty of strengthening Kazakh in cities long dominated by Russian — precisely the Almaty and Astana context examined here — while more recent work confirms an evolving but still Russian-inflected urban environment (Koptleuova et al., 2023; Tlepbergen et al., 2025). The implication is that language choice in Kazakhstan is not a neutral channel decision but a culturally loaded signal.

2.4 Synthesis and the Research Gap

Three conclusions follow from this review. First, advertising language reliably shapes brand evaluations, but it does so through congruence — the fit between the language and the consumer's dominant orientation — rather than as a uniform main effect (Luna and Peracchio, 2005; Puntoni et al., 2009; Hornikx et al., 2013). Second, this congruence is conditioned by language identity, which is multidimensional and therefore best treated as a measured moderator rather than a background descriptor (Tajfel and Turner, 1979). Third, Kazakhstan's post-Soviet, urban bilingualism gives Kazakh and Russian distinctive symbolic loadings that warrant local study, because findings from majority–minority settings elsewhere cannot simply be transposed to a context in which the two languages occupy overlapping rather than strictly hierarchical positions (Dave, 2007; Smagulova, 2008). Surveys are the standard means of examining such consumer attitudes and brand evaluations (Malhotra, 2020). Yet existing research has rarely connected advertising language to multidimensional brand goodwill, with a within-person test of congruence, among Gen Z consumers in Kazakhstan's bilingual urban digital environment; nor has it established whether such a study is practically feasible — whether respondents can supply the language-specific brand recall the design requires, and whether identity groups can be recruited in balance. Addressing that feasibility question, and producing preliminary description, is the contribution of the present pilot.

2.5 Theoretical Framework and Hypotheses

The study draws on two complementary perspectives. Language Effects in Advertising explains how advertising in a consumer's dominant or emotionally meaningful language generates stronger affective resonance, greater cognitive fluency, and higher perceptions of authenticity (Luna and Peracchio, 2005; Puntoni et al., 2009; Hornikx et al., 2013). Signaling Theory explains what language communicates about a brand: when consumers cannot directly observe brand qualities, they rely on observable cues — including language — to infer value, credibility, and identity (Spence, 1973; Kirmani and Rao, 2000). Integrating the two, the conceptual model proposes that advertising language (Kazakh vs. Russian) is associated with brand goodwill, moderated by language identity, such that goodwill is highest when advertising language is congruent with the consumer's dominant language.

The following congruence hypotheses are the targets of the main study; they define the design the pilot evaluates and are not tested inferentially here. H1: Among Kazakh-dominant consumers, goodwill will be higher for brands encountered in Kazakh advertising. H2: Among Russian-dominant consumers, goodwill will be higher for brands encountered in Russian advertising. H3: Among balanced bilinguals, goodwill will not differ meaningfully between the two (tested by equivalence testing). H4: Language identity will moderate the effect of advertising language on goodwill, such that the advantage of a given language is greatest when it is congruent with the consumer's dominant identity.

3 METHODOLOGY

3.1 Design and Rationale

This study employed a quantitative, cross-sectional survey design with a within-person (repeated-measures) component, conducted and reported as a pilot. The defining feature was its within-person treatment of advertising language: rather than comparing consumers who saw Kazakh advertising against different consumers who saw Russian advertising, each respondent evaluated one brand recalled in Kazakh and one recalled in Russian. Advertising language thus became a two-level within-subject factor by construction, orthogonal to the between-subjects language-identity moderator. Differencing each respondent's two ratings nets out stable individual differences in brand positivity, offering a degree of control over response-style and common-method variance. The design is non-experimental — advertising language was recalled rather than manipulated — so the study examines associations rather than causal effects. Consistent with guidance that pilot studies be evaluated against feasibility objectives rather than reported as confirmatory tests (Arain et al., 2010; Thabane et al., 2010; Eldridge et al., 2016), the analysis is descriptive and does not test H1–H4.

The rationale for a within-person approach follows directly from the congruence logic. A conventional between-person comparison — contrasting the goodwill of consumers who recall Kazakh advertising with that of different consumers who recall Russian advertising — confounds the language effect with every stable difference that already separates those two groups of people, including their baseline positivity toward brands and their response styles. It also introduces collinearity between advertising language and language identity, because the consumers who recall Kazakh advertising are disproportionately those who are Kazakh-dominant to begin with. Measuring advertising language within the same respondent dissolves both problems: because each person supplies one Kazakh-mapped and one Russian-mapped rating, the contrast is computed against that person's own baseline, and advertising language becomes orthogonal to the between-person identity moderator by construction. The cost of this design is a demanding measurement requirement — each respondent must be able to recall and name a brand in each language — and evaluating whether that requirement can be met in practice is one of the central purposes of the pilot.

3.2 Participants and Recruitment

The target population comprised Generation Z consumers aged 18–25 residing in Almaty or Astana who use Instagram and/or TikTok and encounter advertising on them. Because no sampling frame exists for this population, a purposive, non-probability sampling strategy was used, with recruitment through Instagram, Telegram, WhatsApp, and university student networks. Inclusion criteria were embedded in the questionnaire's screening section and applied during data preparation. For a pilot assessing feasibility rather than testing hypotheses, a small convenience sample of 30–40 respondents was considered sufficient (Thabane et al., 2010); the main study will target roughly 100–120 respondents per language-identity group.

3.3 Instrument and Measures

The instrument was a structured questionnaire administered online via Google Forms in parallel Kazakh and Russian versions reviewed for semantic equivalence. It comprised seven sections: informed consent and eligibility screening (A); social-media use and perceived language distribution of advertising (B); advertising-language preference (C); language identity through multiple indicators (D); the within-person brand-recall task (E); brand goodwill for each recalled brand (F); and demographic controls (G). Attitudinal items used five-point Likert scales. In Section E, respondents named a brand they recall seeing advertised mostly in Kazakh and one mostly in Russian, each with a language-confirmation item and a cannot-recall option; the goodwill battery in Section F was then administered for each named brand. Table 1 summarises the variables and their measurement.

Table 1 Variables, roles, and measurement

Role	Variable	Measurement
IV (within-person factor)	Advertising language encountered	Brand recalled in Kazakh vs. brand recalled in Russian (Section E); two-level within-subject factor.
IV (related disposition)	Advertising language preference	Continuous directional index plus categorical summary and perceived language encountered.
Dependent variable	Brand goodwill	Five-point Likert battery (Section F) per target brand; composite per brand; congruence score = goodwill(congruent) − goodwill(incongruent).
Moderator	Language identity	Everyday/home/media language, proficiency, identification (Section D); classified Kazakh-dominant / Russian-dominant / balanced.
Controls	Demographics, exposure	Age, gender, city, usage intensity, ad attention; platform use and perceived language distribution.

Brand goodwill was measured with five-point Likert items adapted from established scales — trust from Chaudhuri and Holbrook (2001), credibility from Erdem and Swait (2004), and emotional attachment and reputation from Keller (2013) — administered twice, once for each target brand. Language identity was measured with several indicators (everyday, home, schooling, and media language; self-rated proficiency; and strength of identification with each language), and respondents were classified into Kazakh-dominant, Russian-dominant, and balanced bilingual groups using a transparent rule based on their dominant everyday, home, and media languages.

3.4 Analytical Strategy

Responses from the two language versions were combined and prepared in Python using pandas and SciPy. Likert responses were converted to numeric values; categorical items — preference, perceived exposure, language-identity indicators, and demographics — were harmonised across the Kazakh and Russian versions into common categories; and eligibility screening was applied to remove ineligible cases. Because this was a pilot, the analysis was descriptive and feasibility-oriented: it described the achieved sample by language version and identity group, the screening yield, the proportion of respondents who could name a language-specific brand (the anchoring rate), and the reliability of the goodwill battery for each target brand using Cronbach's alpha, together with the descriptive distributions of language identity, preference, and perceived exposure, and the preliminary direction of the within-person goodwill contrast. The confirmatory 2 (advertising language, within-subjects) × 3 (language identity, between-subjects) mixed-design analysis planned for the main study was not executed, because the pilot is neither designed nor powered for it.

Several features support the validity and reliability of the measures. Construct validity rests on established conceptual definitions and on scales adapted from prior branding research (Chaudhuri and Holbrook, 2001; Erdem and Swait, 2004; Keller, 2013). The within-person design is itself a validity feature, since differencing each respondent's two ratings removes stable individual positivity and much common-method variance from the advertising-language contrast — provided the ratings are anchored to genuinely recalled brands, a condition the pilot evaluates directly. Two design-level limitations are inherent: because advertising language is recalled rather than manipulated, the congruence relationship is observational and cannot support causal claims, and reliance on recalled brands makes the goodwill measure vulnerable to recall and selection effects. Ethically, participation was voluntary and anonymous, based on informed consent, restricted to respondents aged 18 and over, and posed minimal risk; no personally identifying information was collected.

4 RESULTS

All figures below are descriptive; given the sample size they carry no inferential weight and are presented to evaluate the design and inform the main study.

4.1 Sample and Recruitment Feasibility

Thirty-five responses were received: 32 via the Russian-language form and only 3 via the Kazakh-language form. After eligibility screening, 29 responses were retained; six were excluded on age, confirming that ineligible respondents reach the dataset and that post-hoc screening is necessary. Of the 29 eligible respondents, 18 were in Astana and 11 in Almaty, and 20 identified as women and 9 as men. The clearest feasibility finding is the severe imbalance by language version: 27 of 29 eligible respondents completed the Russian form and only 2 the Kazakh form, so recruitment as conducted reached a predominantly Russian-using segment and did not deliver balanced groups. Table 2 summarises the feasibility indicators.

Table 2 Pilot feasibility indicators

Indicator	Result
Responses received (Kazakh form / Russian form)	35 total (3 / 32)
Eligible after screening	29 (6 excluded on age)
Eligible by form (Kazakh / Russian)	2 / 27
Language-identity groups (Kaz-dom. / Rus-dom. / balanced)	5 / 12 / 12
Could name a Kazakh-advertised brand	10 of 29 (34%)
Could name a Russian-advertised brand	8 of 29 (28%)
Goodwill battery completed despite no brand named	majority
Goodwill scale reliability (Cronbach's α), each brand	.97 and .98

4.2 Language Identity, Preference, and Exposure

Classifying respondents from their everyday, home, and media languages produced 5 Kazakh-dominant, 12 Russian-dominant, and 12 balanced bilingual respondents, leaving the Kazakh-dominant group — central to H1 — the smallest. The identity indicators diverged informatively: mean self-rated proficiency was higher for Russian (4.55) than Kazakh (3.83), yet identity importance and emotional connection were higher for Kazakh (importance 4.07 vs. 3.41; emotional connection 4.03 vs. 3.28). Russian was thus the more fluently used language, while Kazakh carried stronger identity and affect even in this Russian-leaning sample (Table 3).

Table 3 Language-identity indicators: means on a 1–5 scale

Indicator	Kazakh (mean)	Russian (mean)
Self-rated proficiency	3.83	4.55
Identity importance	4.07	3.41
Emotional connection	4.03	3.28

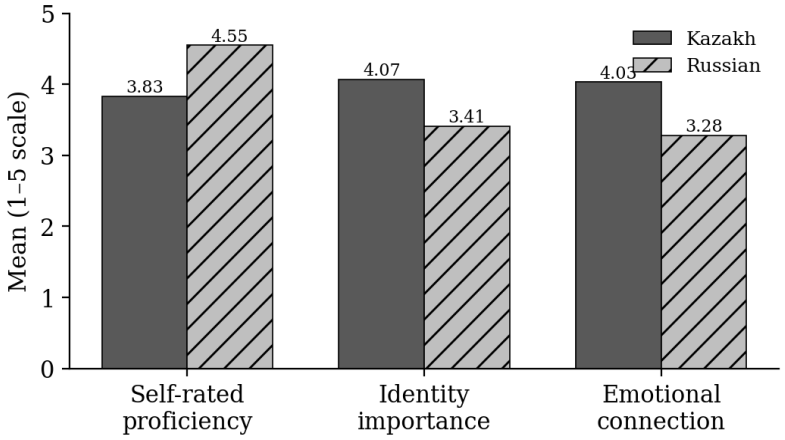


Figure 1: Mean Kazakh and Russian scores on the three language-identity indicators (1–5 scale)

Stated advertising-language preference was most often for neither language exclusively: "both equally" was the modal response (12), followed by prefer-Russian (8), no-preference (5), and prefer-Kazakh (4); the continuous preference index averaged near zero (+0.24 on a −4 to +4 scale). Perceived exposure, by contrast, was clearly Russian-skewed: respondents most often reported encountering advertising in Russian (19 of 29). There is thus a measurable gap between roughly balanced preferences and a Russian-dominated perceived advertising environment (RQ3). The symbolic-association items were only weakly endorsed (Kazakh-as-authentic 3.24; Russian-as-modern 3.07, both near the scale midpoint).

4.3 Brand Recall, Anchoring, and the Goodwill Contrast

Only 10 of 29 respondents (34%) could name a brand they recalled seeing advertised mostly in Kazakh, and only 8 of 29 (28%) could name one advertised mostly in Russian; the remainder selected "cannot recall." The brands named were on-theme: Kazakh-advertised names skewed local and identity-coded (e.g., Kaspi, Qazaq Republic, BI Group, inDrive), while Russian-advertised names skewed global or utilitarian (e.g., Apple, Wolt, Romand). However, the goodwill battery was completed by all 29 respondents for both target brands, including the majority who had not named a brand, because the fielded form did not gate the goodwill items on successful recall. Most goodwill ratings are therefore not anchored to a real, language-specific brand, and the within-person congruence contrast cannot be computed validly from the pilot data.

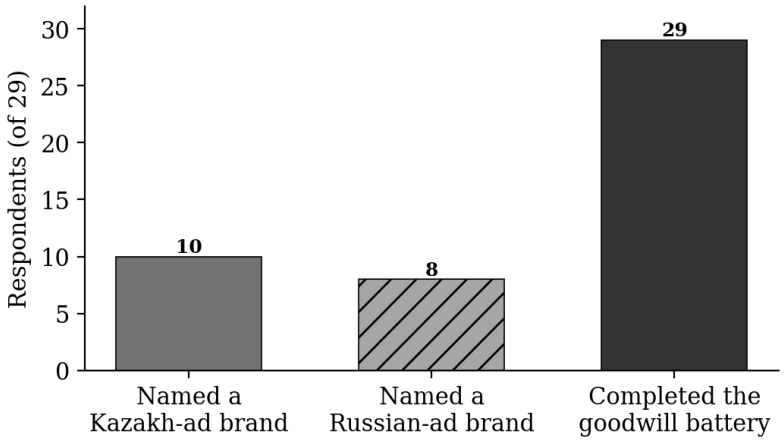


Figure 2: Respondents who could name a language-specific brand versus those who completed the goodwill battery (N = 29)

The goodwill battery showed very high internal consistency for each target brand (Cronbach's α = .97 and .98), although alpha is inflated at this sample size and by largely undifferentiated responding, and the four sub-dimensions moved together so closely that they were not empirically separable here. With the strong caveat that most ratings are unanchored, the preliminary within-person contrast was small: mean goodwill was 3.30 for the brand mapped to Kazakh advertising and 3.17 for the brand mapped to Russian advertising, a within-person difference of +0.13 (illustrative paired comparison, $p = .26$). Given the unanchored dependent variable and the tiny, imbalanced sample, this pattern should be read as "no signal detectable" rather than as evidence about congruence.

5 DISCUSSION

Although the pilot could not test congruence, the descriptive patterns it produced are coherent. The most striking is a dissociation within language identity: respondents rated their proficiency in Russian more highly than in Kazakh, yet attached greater identity importance and emotional connection to Kazakh. This mirrors the sociolinguistic literature on Kazakhstan, in which Russian functions as the established urban language even as Kazakh gains identity weight (Dave, 2007; Smagulova, 2008), and it matters theoretically because the two language-effect routes point in different directions for the same consumers: a cognitive-fluency route would favour Russian, while an affective route would favour Kazakh (Puntoni et al., 2009). Which route dominates is an empirical question an anchored congruence test is well placed to address. A second pattern is the gap between near-balanced stated preference and a Russian-skewed perceived environment, consistent with the idea that Kazakh-language advertising may be encountered less often than its identity resonance among this cohort might warrant — though, because exposure here is perceived rather than measured at the source, this remains a hypothesis for the main study.

The pilot's most consequential finding is an instrument one, not a substantive result. Because the fielded questionnaire did not gate the goodwill battery on successful recall, most respondents

rated brands they had not named, leaving the central dependent variable unanchored. This is a flaw of implementation, not of the design's logic: the within-person congruence design remains sound and advantageous, because differencing each respondent's two ratings removes stable individual positivity and much common-method variance — but that advantage is realised only when the two ratings are anchored to genuinely recalled, language-specific brands. Establishing this anchoring rate, and exposing the missing-cell problem before a large sample was committed, is exactly the kind of result a pilot exists to deliver (Thabane et al., 2010; Eldridge et al., 2016); in that sense the failure of the dependent variable is a successful pilot outcome. The low recall itself is informative, suggesting that consumers do not readily encode advertising by its language, and the marginally lower recall for Russian-advertised brands is consistent with a markedness interpretation in which Russian advertising is the unmarked urban norm.

A third pattern is more tempering. The symbolic-association items — Kazakh as authentic and Russian as modern — were only weakly endorsed, sitting close to the scale midpoint (3.24 and 3.07). The sharp symbolic contrasts reported elsewhere, such as Hindi signalling belongingness and English signalling cosmopolitanism in Krishna and Ahluwalia's (2008) Indian study, were therefore not strongly echoed at the level of these explicit items in this sample. This could reflect the small, Russian-leaning sample, the bluntness of single explicit items, or a genuinely muted symbolic distinction among urban bilinguals for whom both languages are everyday. Whether language nonetheless operates as a signal at the brand level (Spence, 1973; Kirmani and Rao, 2000) is precisely what anchored goodwill ratings would reveal, and the weak explicit endorsement is itself a useful caution against assuming strong symbolic effects in advance.

Two aspects of the recall pattern deserve emphasis because they inform the redesign. First, the low overall recall suggests that consumers do not readily encode or retrieve advertising by its language: identifying “a brand I mostly saw advertised in Kazakh” is a demanding memory task, distinct from simply responding to an ad's language when it is in front of them (Noriega and Blair, 2008). This implies that the main study cannot rely on unaided recall alone and must scaffold the task. Second, the inability to recall was marginally greater for the Russian-advertised brand than for the Kazakh-advertised one, consistent with a markedness interpretation: in a Russian-default urban environment, Russian advertising is the unmarked norm and harder to single out, whereas distinctly Kazakh advertising is comparatively marked and salient. The brands that were named fit this reading, with Kazakh-advertised recalls skewing local and identity-coded and Russian-advertised recalls skewing global and utilitarian.

5.1 Implications for the Main Study

The pilot translates directly into a set of concrete refinements. The first and most important is to enforce anchoring: the goodwill battery must be gated on a named brand through skip logic, so that a respondent rates a brand's goodwill only after naming and language-confirming it, and never rates a brand they could not recall. Without this single change, the within-person congruence contrast cannot be computed, however large the sample. The second is to ease the recall task and plan for missing data — for example by prompting respondents with category cues or examples,

allowing time to reflect, or offering a curated short list of brands as a fallback — while anticipating that some respondents will still supply only one of the two brands.

The third refinement concerns the sample. Reaching roughly 100–120 respondents per identity group will require dedicated Kazakh-language recruitment channels and explicit quotas for Kazakh-dominant and balanced respondents, rather than the open online call used here, which over-recruited Russian-form users. Hard eligibility screening should be built into the form through branching logic so that ineligible respondents are excluded automatically rather than after the fact. Fourth, order effects should be controlled directly: the presentation order of the two target brands should be counterbalanced — using a survey platform that randomises order, or two mirrored forms — and the mapping between each goodwill rating and the brand it refers to should be recorded explicitly rather than inferred at the analysis stage.

Two further measurement points follow from the reliability results. Because the four goodwill sub-dimensions were empirically inseparable in the pilot, the battery could be shortened to reduce respondent burden, with separability re-examined once ratings are properly anchored; there is little value in administering sixteen items per brand if they collapse onto a single dimension. And the equivalence test planned for H3 should be specified in advance: a smallest effect size of interest — the equivalence bound for the two one-sided tests procedure — should be set before data collection, ideally informed by an anchored re-estimate of the within-person difference, so that a genuinely null congruence effect among balanced bilinguals can be distinguished from a merely underpowered one. With these refinements in place, the main study can proceed to the planned mixed-design analysis with simple-effects contrasts and equivalence testing, and so move from establishing feasibility to a genuine test of congruence.

5.2 Limitations

The limitations should be read in light of the study's purpose as a pilot, but they are real. The foremost is the sample: with 29 eligible respondents, a heavy skew toward the Russian-language form, and only five Kazakh-dominant respondents, the data cannot support inferential conclusions. The second is the anchoring problem: because most goodwill ratings were not tied to a genuinely recalled brand, the central dependent variable is compromised. Further limitations are methodological — the fielded form did not counterbalance battery order, the sampling was purposive and self-selected, and all measures were self-reported, cross-sectional, and observational, so the findings are subject to recall and social-desirability bias and cannot establish causation. The very high reliability coefficient is likewise inflated by the small sample. Sample size and balance, the anchoring procedure, counterbalancing, and hard screening are all fixable in the main study; the cross-sectional, observational, self-report character of a recall-based survey is more inherent and bounds the design to claims about association rather than causation.

6 CONCLUSION

This pilot set out to test whether a within-person, identity-moderated design could produce the data needed to examine linguistic congruence between advertising language and brand goodwill among Gen Z consumers in Almaty and Astana, and to surface preliminary patterns ahead of a larger study. It achieved that purpose. It tested the feasibility of the design and recruitment strategy, identified a decisive but entirely fixable instrument problem in the anchoring of the goodwill battery, exposed a severe recruitment imbalance toward Russian-language respondents, and produced a coherent preliminary description of language identity, preference, exposure, and goodwill.

Taken together, the descriptive findings are consistent with the congruence framing and the Kazakhstani sociolinguistic literature: Russian appears as the fluent, default language of the urban environment, while Kazakh carries greater identity and emotional weight, and consumers' roughly balanced language preferences sit against a Russian-skewed advertising environment they perceive. These patterns do not confirm congruence — the compromised dependent variable and the small, imbalanced sample preclude that — but they are the kind of patterns a congruence account would predict, and they sharpen the hypotheses the main study will test. The contribution of this study is therefore methodological and preparatory rather than confirmatory. It delivers a de-risked, refined within-person design, a clear set of instrument and recruitment fixes, and a preliminary evidence base for power and hypothesis specification. With the anchoring enforced, the sample balanced and adequately sized, and order effects controlled, the main study can move from establishing feasibility to a proper test of whether brand goodwill is highest when advertising language is congruent with the consumer's dominant language identity — the question this pilot was built to make answerable.

Beyond the immediate main study, the design opens several avenues for future work. The proficiency–attachment dissociation observed here invites replication in older cohorts, whose linguistic formation predates the post-independence expansion of Kazakh-medium education and whose identity profiles may therefore differ; the same within-person logic could be extended to other bilingual markets in the region, and, once anchoring is enforced, to channels beyond Instagram and TikTok, including television and outdoor advertising. Establishing whether the four goodwill sub-dimensions separate under properly anchored measurement would further clarify whether advertising language acts chiefly on the trust-and-credibility facet, the affective-attachment facet, or the construct as a whole. In each case, the value of the present pilot is that it converts an untested design ambition into a concrete, well-specified measurement programme.

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Key Macroeconomic Factors Influencing Household Borrowing in Kazakhstan in 2015–2024

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Introduction

Over the past decade, household borrowing has become an increasingly important component of financial systems in both developed and emerging economies. Access to consumer credit allows households to smooth consumption, finance large purchases, and maintain living standards during periods of income fluctuation. At the same time, rapid growth of household debt may create vulnerabilities for financial systems and increase macroeconomic risks if borrowing expands faster than income growth. As a result, understanding the macroeconomic factors that influence household borrowing has become a significant topic in economic and financial research.

Kazakhstan represents an interesting case for analyzing these dynamics. In recent years, the country has experienced substantial growth in consumer lending, supported by the expansion of banking services, financial sector reforms, and increasing accessibility of credit products. The development of digital banking and financial technologies has further contributed to the rapid expansion of household credit. At the same time, Kazakhstan's economy has been exposed to several external and internal shocks, including fluctuations in global commodity markets and the economic disruption caused by the COVID-19 pandemic.

Given these developments, identifying the macroeconomic drivers of household borrowing in Kazakhstan is important for understanding the sustainability of credit expansion and its implications for financial stability. This study therefore aims to examine the key macroeconomic factors influencing household borrowing in Kazakhstan during the period **2015–2024**.

Research Objective

The main objective of this research is to analyze the relationship between selected macroeconomic indicators and the dynamics of household borrowing in Kazakhstan's banking sector. In particular, the study seeks to determine which macroeconomic variables have the most significant impact on the volume of consumer loans issued by commercial banks.

The analysis focuses on four macroeconomic variables that represent key aspects of economic performance and labor market conditions:

- **Average Wages**, representing household income and borrowing capacity
- **Gross Domestic Product (GDP)**, reflecting overall economic activity
- **Consumer Price Index (CPI)**, capturing inflation dynamics

- **Unemployment Rate**, representing labor market stability

In addition, the study incorporates a **dummy variable for the year 2020**, which represents the beginning of the COVID-19 pandemic and the associated economic disruptions.

The **dependent variable** used in the analysis is the **Individual Loan Portfolio**, which reflects the total volume of loans issued to individuals by fifteen major commercial banks operating in Kazakhstan during the study period.

Data and Methodology

The study uses annual data covering the period **2015–2024**. The dataset includes financial information from fifteen major commercial banks that collectively represent a significant share of Kazakhstan's retail lending market.

To analyze the relationship between macroeconomic variables and household borrowing, the study applies **econometric methods**, with **fixed-effects regression analysis** serving as the primary analytical tool. This approach allows the analysis to control for unobserved heterogeneity across banks and to estimate the influence of macroeconomic variables on the dynamics of household lending over time.

The regression model includes the following explanatory variables: Average Wages (AW), Gross Domestic Product (GDP), Consumer Price Index (CPI), Unemployment Rate (UR), and a dummy variable representing the year 2020.

The estimated regression results indicate that the model has a **within R^2 of 33.53%**, meaning that approximately one-third of the variation in household borrowing within the observed units over time is explained by the included variables. The **F = 24.45** indicates that the model is statistically significant overall, suggesting that the selected macroeconomic indicators collectively provide meaningful explanatory power for variations in household lending.

Empirical Results

The regression results reveal that **GDP and CPI have positive and statistically significant effects on household borrowing in Kazakhstan**.

GDP demonstrates the strongest positive relationship with the individual loan portfolio, indicating that periods of economic growth are associated with increased household borrowing. This result is consistent with economic theory, which suggests that economic expansion improves income prospects, consumer confidence, and access to credit.

The Consumer Price Index also shows a positive and statistically significant relationship with household borrowing. This finding suggests that rising prices may encourage households to increase borrowing in order to maintain consumption levels or finance purchases before further price increases occur.

In contrast, **Average Wages and the Unemployment Rate do not demonstrate statistically significant effects in the model**. Although economic theory generally predicts that

income growth and labor market conditions influence borrowing capacity, the results suggest that these factors may play a more indirect role in shaping household credit dynamics in Kazakhstan.

The **dummy variable for 2020**, representing the onset of the COVID-19 pandemic, is positive and statistically significant. This result indicates that household borrowing increased during the pandemic year compared with other years in the dataset. One possible explanation is that households relied more heavily on credit to cope with income uncertainty and economic disruptions during this period.

Discussion

The empirical results suggest that **macroeconomic conditions—particularly economic growth and inflation—play a central role in shaping household borrowing in Kazakhstan**. Economic expansion tends to increase both the demand for credit among households and the willingness of financial institutions to extend loans.

The positive relationship between inflation and borrowing may reflect the structure of consumer lending in Kazakhstan, where installment purchases and short-term consumer loans represent a significant share of household credit. In an environment of rising prices, households may rely on borrowing to finance consumption or accelerate purchasing decisions.

The absence of statistically significant effects for wages and unemployment may reflect structural features of Kazakhstan's credit market, including the increasing role of digital lending platforms, credit scoring systems, and consumer lending products that expand access to credit beyond traditional income-based borrowing capacity.

Finally, the significant effect of the pandemic dummy variable highlights the importance of considering **extraordinary economic shocks** when analyzing borrowing dynamics. The COVID-19 crisis likely altered both borrowing behavior and lending practices, emphasizing the importance of flexible financial policies during periods of economic uncertainty.

Conclusions

The findings of this study contribute to the growing literature on the determinants of household borrowing in emerging economies. The results indicate that **GDP growth and inflation are key macroeconomic drivers of household credit expansion in Kazakhstan**, while wages and unemployment do not demonstrate significant direct effects within the estimated model.

These findings suggest that policymakers and financial regulators should pay particular attention to macroeconomic conditions when monitoring the sustainability of household debt growth. Maintaining macroeconomic stability, promoting responsible lending practices, and strengthening financial literacy among households may help ensure that the expansion of consumer credit contributes positively to economic development without creating excessive financial risks.

Overall, the study provides empirical evidence on the macroeconomic factors influencing household borrowing in Kazakhstan and offers insights that may be useful for policymakers, financial institutions, and researchers interested in credit market dynamics in emerging economies.

Digital Accounting and Sustainable Development

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Abstact

This paper investigates the transformative role of digital accounting in advancing sustainable corporate practices in the digital era. By integrating blockchain, big data, and cloud computing, digital accounting enhances transparency, timeliness, and comparability of Environmental, Social, and Governance (ESG) disclosures. It also strengthens Corporate Social Responsibility (CSR) initiatives through data-driven evaluation and transparent reporting. Policy frameworks such as the EU Corporate Sustainability Reporting Directive (CSRD), U.S. SEC climate disclosure rules, Chinese regulatory initiatives, and IFRS sustainability standards are analyzed to highlight global convergence and divergence. Key challenges include data security, high technological costs, talent shortages, and regulatory fragmentation. Future trends point toward ethical AI, cross-border data governance, integration with green finance, and smart regulation. The findings suggest that digital accounting is not only a technological innovation but also a strategic enabler of sustainable value creation in the digital era. This study contributes to both academic research and corporate practice by bridging the gap between digital accounting technologies and cross-regional sustainability governance.

Keywords: Digital Accounting, ESG Disclosure, Corporate Social Responsibility, Blockchain, Green Finance, Smart Regulation, Sustainability

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1 Introduction

Against the backdrop of global sustainable development, enterprises around the world are confronted with escalating pressure for sustainable development from investors, regulatory institutions and the general public. In this context, digital accounting emerges as a critical research focus. It is not only a technological innovation driven by digital transformation, but also a strategic tool for enterprises to optimize corporate governance and enhance value creation.

Against this research context, this study carries clear theoretical and practical significance. Its core research objectives are to systematically explore the mechanisms and pathways through which digital accounting improves the quality of ESG disclosure and strengthens corporate social responsibility (CSR) practices, and to further analyze the supporting policy frameworks and future development trends of digital accounting in the field of sustainable development.

The remainder of this paper is organized as follows: Section 2 reviews the literature, Section 3 outlines the methodology, Section 4 presents results and discussion, Section 5 concludes with policy implications and future research directions.

2 Literature Review

Existing relevant studies have reached a broad consensus that digitalised tools and technical means integrated into accounting practice can effectively enhance corporate information transparency, optimise internal control efficiency and facilitate the standardized management of business operations (Alassuli et al., 2025; IOSR Journals, 2024). For instance, scholars have verified that digital accounting technologies break through the limitations of traditional manual accounting, improve the accuracy and timeliness of corporate financial and non-financial information sorting, and further boost the overall transparency of corporate operation information (Deloitte, 2023). Nevertheless, most current research focuses on the generic impacts of digital transformation on accounting governance and information disclosure within a single country or specific industry, while in-depth investigations into the compliance dilemmas, cross-regional adaptation challenges and practical obstacles confronted by multinational enterprises remain insufficient (KPMG, 2022; PwC, 2022). Relevant research fails to fully consider the heterogeneity of business scenarios and regulatory environments faced by transnational corporations, leaving this research direction to be further supplemented and improved.

For the theoretical analysis of this study, this paper integrates Institutional Theory and Stakeholder Theory to construct a complete theoretical framework, so as to systematically interpret the internal and external driving forces for enterprises to implement digital accounting reform. Institutional Theory illustrates the external constraints and promotion effects, including regulatory requirements, industrial norms and social supervision, which push enterprises to upgrade their accounting systems and advance digital transformation to conform to external institutional environments (DiMaggio and Powell, 1983). In contrast, Stakeholder Theory clarifies the internal motivation of enterprises, that is, optimizing digital accounting can better respond to the appeals of investors, social publics, employees and other core stakeholders, and further consolidate corporate governance and long-term value creation (Freeman, 1984).

Combing through the existing literature, prominent research gaps still exist in this field. At present, few scholars have conducted a systematic and comprehensive comparative analysis on the discrepancies of regional regulatory policies, institutional differences and the differentiated application effects of digital accounting technologies (Abdelhaq et al., 2025). The extant research lacks targeted exploration of the interactive relationship between cross-regional policy differences and digital accounting technology implementation, as well as their joint impacts on corporate sustainable development practices, which also points out the core breakthrough direction of this study.

3. Methodology

This study adopts a combined research approach integrating case study analysis and policy analysis, which is suitable for revealing the coupling relationship between digital accounting practices, policy frameworks and corporate ESG performance.

3.1 Data Sources

Multi-source data are collected to ensure the validity and reliability of the analysis:

Corporate practice data: Official sustainability reports, ESG reports and annual public disclosures of representative enterprises including Microsoft and Alibaba, focusing on their digital accounting application and CSR practice details (Web-1, Web-2).

Policy and standard documents: Authoritative policy texts, regulatory requirements and disclosure guidelines issued by the European Union, the United States, China and the IFRS Foundation related to sustainable development, ESG disclosure and digital accounting governance (Web-3, Web-4).

3.2 Analysis Methods

Cross-regional policy framework comparison: Systematically compare the objectives, content, supervision intensity and implementation paths of digital accounting and ESG-related policies in different economies(Web-3, Web-4).

Policy-practice cross-validation: Combine enterprise case evidence with policy requirements to conduct matching analysis, so as to identify how digital accounting improves ESG disclosure quality and strengthens CSR under different institutional environments (Web-1, Web-2).

3.3 Comparative Analysis

Table 1 Comparative ESG Disclosure Technologies

Technology	Application of ESG	Advantages	Restriction
Blockchain	Immutability of data	Transparency	High cost
Big Data	Real time monitoring	Accuracy	Complexity
Cloud computing	Global Access	Timeliness	Safety risk

4 Results and Discussion

4.1 ESG Disclosure Quality Enhancement via Digital Accounting

Digital accounting has significantly improved the quality of information disclosure in environmental, social and governance (ESG) through technical means. Blockchain ensures that ESG data cannot be tampered with, enhancing information transparency and investor trust (Web-6); Big data and cloud computing can realize real-time monitoring of carbon emissions, energy consumption and other indicators, and improve the timeliness of ESG information disclosure (Web-5); The digital platform can also unify disclosure standards in different regions and effectively enhance the comparability of ESG information of multinational enterprises.

For example, Microsoft uses digital tools to disclose its progress in carbon neutrality in real time in its annual sustainability report, which significantly improves the quality of information disclosure and is highly recognized by investors (Web-1). However, there are still significant differences in regulatory policies and standards for digital accounting and sustainable development information disclosure in different countries and regions around the world, and it is difficult for multinational enterprises to adapt to multiple regulatory requirements at the same time, which to some extent aggravates the difficulty of compliance control and disclosure cost of enterprises (Web-3, Web-4).

4.2 CSR Practices and Digital Reporting Mechanisms

Corporate social responsibility is an important part of sustainable development, and digital accounting and reporting systems provide more powerful support for corporate social responsibility (CSR) practice. In terms of data-driven social responsibility management, enterprises can use big data analysis to scientifically evaluate the effectiveness of CSR projects, so as to optimize resource allocation. In terms of the transparency of social contributions, blockchain technology can ensure that the fund flow of public welfare projects can be traced and cannot be tampered with, realizing openness and transparency (Web-6). At the same time, digital platforms also help to strengthen the interaction between enterprises, employees and communities, and enhance the sense of social participation and responsibility of all employees.

For example, Alibaba uses digital platforms to disclose the use of public welfare funds, which effectively improves information transparency and enhances the public's trust in the enterprise (Web-2). However, at present, there are significant differences in regulatory policies and standards for digital accounting, sustainable development and corporate social responsibility information disclosure in different countries and regions around the world.

4.3 Cross-Regional Policy Frameworks for Digital Accounting and ESG

The effective implementation of digital accounting and sustainable development is inseparable from the strong support of policy guidance and supervision system. The EU's Corporate Sustainability Reporting Directive (CSRD) clearly requires enterprises to fully disclose ESG-related information and actively promote the standardization construction of digital reporting. The Securities and Exchange Commission (SEC) of the United States has also continuously strengthened the supervision of ESG information disclosure of enterprises, and encouraged the application of digital tools in information accounting and disclosure. China's regulatory policies also encourage enterprises to adopt digital accounting systems to improve the quality and transparency of sustainable development information disclosure. At the same time, IFRS sustainable disclosure standards provide a unified disclosure framework for global enterprises, helping multinational enterprises promote digital transformation and information synergy.

However, at present, there are still significant differences in the regulatory policies and standards for digital accounting and sustainable development information disclosure in different countries and regions around the world.

EU CSRD: requires companies to disclose ESG information and promotes the standardization of digital reporting.

US SEC: Strengthen the regulation of corporate ESG disclosure and promote the application of digital tools.

Regulatory policy in China: Encourage enterprises to adopt digital accounting systems to enhance the quality of sustainability information disclosure.

International Standards: IFRS Sustainable Disclosure Standards provide a unified framework for global enterprises to promote the digital transformation of multinational enterprises.

4.4 Risks and Challenges

Despite the significant advantages of digital accounting in promoting the sustainable development of enterprises, it still faces multiple challenges in practical application. First of all, digital platforms carry a large amount of financial and non-financial sensitive information, and the problems of data security and privacy protection are prominent, so it is necessary to effectively prevent the risk of data leakage and network attack. Secondly, digital transformation requires high technology investment and operation and maintenance costs, which are often difficult for small and medium-sized enterprises to bear, creating significant barriers to application. Thirdly, digital accounting requires employees to have both accounting professional ability and digital technology literacy. Finally, regulatory differences bring compliance problems. There are obvious differences in regulatory policies and standards for digital accounting and sustainable development information disclosure in different countries and regions around the world.

4.5 Future Development Trends

In the future, digital accounting and sustainable development guarantee will show the following trends:

Ethical application of artificial intelligence: The application of AI in accounting and reporting should follow ethical principles to avoid algorithm bias.

Cross-country data governance: Establish a unified data governance framework worldwide to improve compliance of multinational enterprises.

Integration of green finance: Digital accounting and green finance are combined to promote enterprises to reflect sustainable development goals in the financing process.

Smart regulation: Regulators will use digital tools to monitor the quality of companies' ESG disclosures in real time.

5. Conclusion

This study confirms that digital accounting is not simply a technological upgrade but a strategic driver of sustainable corporate governance. By integrating blockchain, big data, and cloud computing, enterprises can achieve greater transparency, timeliness, and comparability in ESG disclosures, while also reinforcing CSR practices through more reliable and traceable reporting mechanisms. The evidence from leading companies such as Microsoft, Alibaba, SAP, and IBM demonstrates that digital tools are already reshaping sustainability strategies and enhancing stakeholder confidence.

At the policy level, the comparative analysis of the EU CSRD, U.S. SEC climate disclosure rules, Chinese regulatory initiatives, and IFRS sustainability standards highlights both progress toward global convergence and persistent regional divergence. While harmonization is advancing, regulatory fragmentation continues to pose challenges for multinational enterprises, underscoring the need for coordinated international frameworks.

Nevertheless, barriers remain. Data security risks, high technological costs, and shortages of skilled professionals hinder widespread adoption, particularly among small and medium-sized enterprises. Addressing these challenges requires joint efforts from policymakers, industry leaders, and academic institutions.

5.1 Policy Implications

Global Harmonization: Accelerate alignment of ESG disclosure standards to reduce compliance fragmentation.

Capacity Building: Invest in training programs that combine accounting expertise with digital literacy.

Support for SMEs: Provide financial incentives and subsidies to lower the barriers of digital transformation.

Cybersecurity Enhancement: Establish stronger protocols to safeguard sensitive ESG and financial data.

5.2 Future Research Directions

Cross-Industry Case Studies: Extend analysis to sectors such as energy, healthcare, and manufacturing.

Quantitative Impact Assessment: Evaluate the financial and social returns of digital accounting adoption.

AI Integration: Explore how machine learning can improve predictive ESG reporting and risk management.

Stakeholder Perspectives: Investigate how investors, employees, and communities perceive digitalized ESG and CSR disclosures.

In summary, digital accounting is evolving into a cornerstone of sustainable corporate governance. With continued technological innovation, supportive policy frameworks, and collaborative efforts across sectors, it will play a decisive role in shaping the future of global sustainable development.

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Web-6:https://www.ibm.com/blockchain/solutions/nonprofit-transparency (consulted March 10, 2026).

Work Context, Employee Behaviour, and Intrapreneurship in Quasi-Governmental Organizations in Kazakhstan

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ABSTRACT

This paper presents preliminary findings from a quantitative study examining how formal and informal work context factors influence employee intrapreneurial behaviour and innovation-related outcomes in quasi-governmental IT organizations in Kazakhstan. Drawing on the two-step model of intrapreneurship, the study investigates whether organizational environment shapes employee behaviour and whether such behaviour translates into intrapreneurial outcomes. The research is based on survey data collected from employees working in quasi-governmental organizations, with 233 valid responses retained after data cleaning. Preliminary analysis indicates strong reliability of the main measurement scales and strong positive relationships between organizational environment, intrapreneurial behaviour, and intrapreneurial outcomes. Initial regression results suggest that resource availability, supervisor support, and structural flexibility are important predictors of intrapreneurial behaviour, while intrapreneurial behaviour strongly predicts both general and implementation-oriented outcomes. The paper contributes to intrapreneurship research by extending a process-oriented model to a formalized, emerging-market context and offers practical insights for supporting employee-driven innovation in structured organizations.

KEYWORDS: intrapreneurship; intrapreneurial behaviour; work context; supervisor support; resource availability; quasi-governmental organizations; Kazakhstan; employee-driven innovation

INTRODUCTION

Organizations increasingly operate in technology-driven and institutionally complex environments, where innovation depends not only on formal strategy but also on the initiative and creativity of employees. In this context, intrapreneurship has become an important mechanism through which established organizations generate innovation from within (Antoncic & Hisrich, 2001; Opland et al., 2022). Intrapreneurial employees identify opportunities, propose improvements, solve problems proactively, and contribute to the implementation of new ideas inside existing organizations.

Despite the growing relevance of intrapreneurship, the literature remains fragmented. Some studies emphasize individual-level behaviours such as innovative work behaviour and proactivity, whereas others focus on organizational-level outcomes such as innovation performance and strategic renewal (Parker et al., 2010; Urban & Wood, 2017). As a result, the mechanisms connecting organizational context, employee behaviour, and intrapreneurial outcomes remain insufficiently understood.

Rigtering and Weitzel (2013) address this issue through a two-step model of intrapreneurship, in which work context influences intrapreneurial behaviour, which then leads to intrapreneurial outcomes. However, empirical applications of this model remain limited in emerging-market and

quasi-governmental settings. This paper therefore provides preliminary evidence from quasi-governmental IT organizations in Kazakhstan, a context characterized by formalization, hierarchical structures, institutional pressure, and increasing demand for digital innovation.

The main research question guiding the study is: How do formal and informal work context factors influence intrapreneurial outcomes through intrapreneurial behaviour in quasi-governmental IT organizations?

LITERATURE REVIEW AND CONCEPTUAL BACKGROUND

Intrapreneurship refers to entrepreneurial activity conducted by employees within established organizations, including the initiation and implementation of innovative ideas, projects, and renewal activities (Antoncic & Hisrich, 2001). Unlike corporate entrepreneurship, which is often treated as a top-down organizational strategy, intrapreneurship emphasizes bottom-up employee initiative (Kassa & Raju, 2014; Urban & Wood, 2017). This distinction is important because employee-driven innovation depends on workplace conditions, managerial relationships, and perceived support.

A central construct in this literature is intrapreneurial behaviour. It includes proactive, innovative, and opportunity-oriented actions such as identifying inefficiencies, proposing solutions, initiating improvements, and implementing ideas. Related streams of research on innovative work behaviour and proactive behaviour show that employees contribute to innovation through idea generation, idea promotion, and implementation (De Jong & Den Hartog, 2010; Parker et al., 2010). However, behaviour alone does not guarantee outcomes, since implementation often depends on access to resources, managerial approval, and organizational legitimacy.

Work context is therefore critical. Formal aspects of work context include autonomy, participation, resource availability, and formalization. Access to resources allows employees to experiment and develop ideas, while rigid structures may reduce flexibility and discourage initiative (Soetanto & Jack, 2018; Singh & Sarkar, 2012). Informal aspects include trust, supervisor support, and social exchange relationships. Research on leadership and leader-member exchange suggests that employees are more likely to innovate when supervisors provide support, feedback, and psychological safety (Mascareno et al., 2020; Zhang & Bartol, 2010; Wu & Lv, 2024).

The present study adapts Rigtering and Weitzel's (2013) two-step model by examining organizational environment as an antecedent of intrapreneurial behaviour and intrapreneurial behaviour as a pathway to outcomes. Supervisor support is also examined as a moderating factor that may reduce the constraining effects of formalization.

Table 1 Title of the Table

Type of nanoparticles	Average size (nm)	Variance (nm)
CuO	47	4.2
NiO	35	6.4
Al2O3	42	2.1
SnO2	27	3.9

RESEARCH OBJECTIVES AND HYPOTHESES

The objective of this study is to examine whether work context factors influence intrapreneurial behaviour and whether intrapreneurial behaviour translates into intrapreneurial outcomes. The study also explores whether supervisor support moderates the relationship between formalization and behaviour.

The hypotheses guiding the preliminary analysis are as follows: H1: Participation, operationalized through autonomy and flexibility, is positively related to intrapreneurial behaviour. H2: Lower formalization is positively related to intrapreneurial behaviour. H3: Resource availability is positively related to intrapreneurial behaviour. H4: Supervisor support is positively related to intrapreneurial behaviour. H5: Supervisor support moderates the relationship between formalization and intrapreneurial behaviour. H6: Intrapreneurial behaviour is positively related to intrapreneurial outcomes. H7: Intrapreneurial behaviour is positively related to implementation-oriented outcomes.

METHODOLOGY

The study uses a quantitative cross-sectional survey design. Data were collected through an online questionnaire distributed to employees working in quasi-governmental organizations in Kazakhstan. A total of 242 responses were initially collected. After excluding respondents who indicated that they did not work in quasi-governmental organizations, 233 fully completed responses were retained for preliminary analysis.

The questionnaire measured organizational environment, intrapreneurial behaviour, and intrapreneurial outcomes using five-point Likert-type items ranging from 1 = strongly disagree to 5 = strongly agree. Organizational environment included items on support for innovation, autonomy, management encouragement, risk-taking encouragement, resource availability, structural flexibility, and supervisor support. Intrapreneurial behaviour captured proactive and innovation-oriented employee actions. Intrapreneurial outcomes captured idea implementation, project initiation, collaboration, and acceptance of ideas by management.

The preliminary analysis included reliability testing, descriptive statistics, Pearson correlations, regression analysis, mediation-style model comparison, and moderation testing. Since the purpose of this conference paper is to present preliminary findings, the results are interpreted as initial patterns rather than final causal conclusions.

PRELIMINARY RESULTS

Table 1 summarizes the reliability of the main scales. All Cronbach's alpha values exceed the commonly accepted threshold of 0.70, indicating strong internal consistency.

Construct	Number of items	Cronbach's alpha
Organizational Environment (OE)	7	0.87
Intrapreneurial Behaviour (EB)	6	0.89
Intrapreneurial Outcomes (IB)	7	0.91
Implementation Outcomes (IB_outcome)	3	0.84

Table 2 presents descriptive statistics and correlations. The preliminary results show strong positive relationships among organizational environment, intrapreneurial behaviour, and outcomes.

Variable	Mean	SD	1	2	3	4
1. OE_total	3.81	0.97	1			
2. EB_total	3.92	0.94	0.79	1		
3. IB_total	3.85	0.95	0.79	0.85	1	
4. IB_outcome	3.86	1.02	0.73	0.78	0.95	1

The strongest correlation is observed between intrapreneurial behaviour and intrapreneurial outcomes ($r = 0.85$), suggesting that employees who engage in proactive and innovation-oriented behaviour are more likely to report innovation-related outcomes. Organizational environment is also strongly correlated with intrapreneurial behaviour ($r = 0.79$), supporting the theoretical expectation that work context matters for employee initiative.

Preliminary regression analysis was conducted to examine work context predictors of intrapreneurial behaviour. The model was statistically significant and explained 63% of the variance in intrapreneurial behaviour ($R^2 = 0.63$, $F = 64.79$, $p < .001$).

Predictor	Beta (β)	p-value
Autonomy (OE2)	0.09	0.089
Management encouragement (OE3)	0.11	0.047
Risk-taking encouragement (OE4)	0.10	0.046
Resource availability (OE5)	0.17	0.003
Structural flexibility (OE6)	0.13	0.025
Supervisor support (OE7)	0.15	0.004

Resource availability, supervisor support, and structural flexibility emerged as the strongest predictors. Autonomy was positive but did not reach conventional statistical significance. This preliminary pattern suggests that employees in structured quasi-governmental settings may rely more on resources and managerial support than on formal autonomy alone.

The second set of preliminary analyses examined whether intrapreneurial behaviour predicts outcomes and whether it functions as a pathway between organizational environment and outcomes.

Model	Dependent variable	Key predictor(s)	Key coefficient(s)	Model fit
Behaviour → Outcomes	IB_total	EB_total	$\beta = 0.86$, $p < .001$	$R^2 = 0.72$
Behaviour → Implementation	IB_outcome	EB_total	$\beta = 0.84$, $p < .001$	$R^2 = 0.60$

Two-step model	IB_total	EB_total; OE_total	βEB = 0.61; βOE = 0.31, p < .001	$R^2 = 0.76$
Moderation	EB_total	Formalization × Supervisor support	β = -0.15, p < .001	$R^2 = 0.60$

Preliminary results indicate that intrapreneurial behaviour strongly predicts both general outcomes and implementation-oriented outcomes. When organizational environment and intrapreneurial behaviour are included together, both remain significant, suggesting partial mediation. The moderation analysis also suggests that supervisor support weakens the constraining effect of formalization, highlighting the importance of relational support in highly structured settings.

PRELIMINARY DISCUSSION

The preliminary findings support the overall logic of the two-step model. Organizational environment appears to be strongly associated with intrapreneurial behaviour, and intrapreneurial behaviour is strongly associated with outcomes. This suggests that organizational context does not automatically produce innovation; rather, it creates conditions under which employees may act proactively and translate ideas into outcomes.

The results also suggest that not all contextual factors have equal importance. Resource availability and supervisor support appear more influential than autonomy. This is theoretically meaningful in quasi-governmental organizations, where formal autonomy may be limited by hierarchy, regulations, and procedural accountability. In such settings, practical support and managerial encouragement may be more important for enabling employee-driven innovation.

The preliminary moderation result is also important. It suggests that supportive supervisors may reduce the negative effects of formalization. This finding is consistent with the idea that informal relationships can help employees navigate formal constraints and act intrapreneurially even in structured environments.

CONCLUSION

This paper presents preliminary evidence on the relationship between work context, intrapreneurial behaviour, and intrapreneurial outcomes in quasi-governmental IT organizations in Kazakhstan. The initial findings suggest that resources, supervisor support, and structural flexibility are important drivers of intrapreneurial behaviour, while intrapreneurial behaviour strongly predicts innovation-related outcomes.

The study contributes to the literature by extending a process-oriented model of intrapreneurship to an emerging-market quasi-governmental context. Practically, the results suggest that organizations seeking to foster employee-driven innovation should focus on providing resources, strengthening managerial support, and creating conditions in which employees feel able to act on ideas.

As the results are preliminary, future analysis may further refine the model, examine additional control variables, and test the robustness of the findings using more advanced techniques.

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AI in financial markets: profitability effects, ethical, legal and regulatory challenges in Kazakhstani banks

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ABSTRACT

Artificial Intelligence (AI) is rapidly transforming the global financial sector by improving operational efficiency, risk assessment, customer service, and decision-making processes. In Kazakhstan, the banking industry has accelerated its digital transformation efforts, creating favorable conditions for the adoption of AI-driven technologies. Despite the increasing implementation of AI solutions, empirical evidence regarding their impact on bank profitability in emerging economies remains limited. This study investigates the relationship between AI adoption and profitability among major Kazakhstani banks between 2014 and 2023. Using panel data analysis, the research evaluates the effects of AI adoption on Return on Assets (ROA) and Return on Equity (ROE), while controlling for macroeconomic factors such as GDP growth and inflation, as well as bank-specific characteristics.

The findings indicate that AI adoption positively influences bank profitability and contributes to improvements in operational efficiency, customer engagement, and risk management. The results further demonstrate that GDP growth supports profitability, while inflation exerts a negative effect. Additionally, larger banks benefit from economies of scale and are better positioned to exploit AI technologies. The study also explores ethical, legal, and regulatory challenges associated with AI implementation, including algorithmic bias, data privacy, model transparency, and regulatory readiness. The paper concludes with policy recommendations aimed at supporting responsible AI adoption within Kazakhstan's financial sector.

Keywords: Artificial Intelligence, Banking, Profitability, Kazakhstan, Financial Markets, ROA, ROE, Regulation.

1 INTRODUCTION

1.1 Background of the Study

Artificial Intelligence has emerged as one of the most significant technological innovations shaping the modern economy. Financial institutions around the world increasingly rely on AI-powered systems to automate processes, improve risk assessment, detect fraud, enhance customer service, and optimize strategic decision-making. The banking sector, in particular, has become one of the leading adopters of AI technologies due to the vast amount of data generated through financial transactions and customer interactions.

The digital transformation of banking has accelerated significantly during the past decade. Traditional banking models are being replaced by technology-driven ecosystems that emphasize efficiency, speed, and personalized services. Machine learning algorithms can analyze large volumes of structured and unstructured data in real time, enabling banks to identify patterns,

predict customer behavior, and make more accurate decisions. As a result, AI has become a critical strategic resource for maintaining competitiveness in an increasingly digital financial environment.

Kazakhstan represents a particularly interesting case for studying the impact of AI in banking. The country has invested heavily in digital infrastructure and financial modernization initiatives. Leading financial institutions such as Kaspi Bank and Halyk Bank have introduced advanced digital platforms, automated customer service tools, and data-driven decision-making systems. At the same time, Kazakhstan remains an emerging economy characterized by macroeconomic volatility, regulatory evolution, and structural transformation. These characteristics provide an important context for evaluating how AI influences banking performance.

The growing adoption of AI technologies raises important questions regarding their financial impact and broader implications. While technological innovation is generally expected to improve efficiency and profitability, empirical evidence remains limited in emerging markets. Furthermore, the implementation of AI introduces ethical, legal, and regulatory challenges that require careful consideration by both policymakers and financial institutions.

1.2 Research Problem

Despite the growing importance of AI in banking, there is limited empirical evidence regarding its impact on profitability within Kazakhstan's financial sector. Most existing studies focus on developed economies, where institutional structures, technological infrastructure, and regulatory frameworks differ substantially from those in emerging markets.

As a result, policymakers and banking executives lack sufficient evidence to assess whether investments in AI generate measurable financial benefits under Kazakhstan's specific economic conditions. Furthermore, there is limited understanding of the ethical and regulatory implications associated with AI adoption in the country's banking system.

1.3 Research Objectives

The primary objective of this study is to examine the impact of AI adoption on the profitability of Kazakhstani banks.

Specific objectives include:

Evaluating the effect of AI adoption on ROA and ROE.

Examining the influence of GDP growth and inflation on profitability.

Assessing the role of bank size in financial performance.

Identifying ethical and regulatory challenges associated with AI implementation.

Developing recommendations for policymakers and banking institutions.

1.4 Research Questions

The study seeks to answer the following questions:

1. Does AI adoption improve bank profitability in Kazakhstan?
2. How do macroeconomic factors influence profitability?
3. What role does bank size play in determining financial performance?
4. What ethical and regulatory challenges arise from AI adoption?
5. How can Kazakhstan improve its regulatory readiness for AI-driven banking?

2 LITERATURE REVIEW

2.1 Artificial Intelligence in Banking and Financial Markets

Artificial Intelligence has become a transformative force in modern financial systems. Financial institutions increasingly depend on AI-enabled technologies capable of processing vast quantities of information in real time. Unlike traditional statistical methods, AI systems can continuously learn from new information and adapt their predictions accordingly.

Machine learning algorithms are widely applied in credit scoring, fraud detection, anti-money laundering systems, algorithmic trading, portfolio optimization, and customer analytics. These technologies significantly improve the accuracy of predictions and reduce operational costs.

Researchers argue that AI lowers the cost of prediction, which is one of the core functions of financial intermediation. By reducing prediction costs, banks can automate decision-making processes and allocate resources more efficiently. AI systems are particularly valuable in identifying nonlinear relationships within complex financial datasets that traditional models may fail to capture.

The implementation of AI technologies can generally be categorized into three areas:

- Front-office applications, including chatbots, virtual assistants, and personalized product recommendations.
- Middle-office applications, such as risk management, fraud detection, and compliance monitoring.
- Back-office automation, including document processing, reporting, and transaction reconciliation.

These applications collectively contribute to operational efficiency, improved customer experience, and stronger competitive positioning.

2.2 AI and Bank Profitability

A growing body of academic literature suggests that technological innovation positively influences bank profitability. Artificial Intelligence contributes to profitability through multiple channels, including automation, cost reduction, risk optimization, customer retention, and revenue enhancement.

One of the most important benefits of AI is its ability to automate repetitive and labor-intensive tasks. Traditional banking operations often require significant human involvement in activities such as loan processing, compliance monitoring, customer support, and transaction verification. AI-powered automation reduces processing time, minimizes errors, and lowers operating costs. Consequently, banks can allocate resources more efficiently and improve overall productivity.

Machine learning models also enhance credit risk assessment. Traditional credit scoring systems rely on limited financial indicators, whereas AI systems can evaluate thousands of variables simultaneously. This allows banks to make more accurate lending decisions, reducing default rates and improving portfolio quality. Lower credit losses contribute directly to profitability through reduced provisioning expenses and stronger asset performance.

Another important source of profitability arises from customer analytics. AI enables banks to better understand customer behavior, preferences, and financial needs. Through predictive

analytics and personalized recommendations, financial institutions can increase cross-selling opportunities, strengthen customer loyalty, and improve customer lifetime value. These factors contribute to both interest and non-interest income growth.

Several studies demonstrate that digital transformation is positively associated with financial performance. Banks that successfully integrate AI technologies often achieve higher operational efficiency, greater customer satisfaction, and stronger competitive positioning. These advantages ultimately translate into improved profitability indicators such as Return on Assets and Return on Equity.

2.3 Macroeconomic Determinants of Bank Profitability

Bank profitability is not determined solely by internal managerial decisions. External economic conditions also play a significant role in shaping financial performance.

Gross Domestic Product (GDP)

GDP growth is one of the most widely used indicators of economic performance. When economic activity expands, businesses invest more, households consume more, and demand for financial services increases. Banks benefit from higher loan demand, greater transaction volumes, and improved asset quality.

Economic growth also enhances borrower solvency. Individuals and firms are more capable of meeting financial obligations during periods of expansion, reducing default rates and improving loan portfolio quality. Consequently, GDP growth is generally associated with higher profitability in the banking sector.

In Kazakhstan, the relationship between GDP and banking performance is particularly important due to the country's dependence on commodity exports. Economic fluctuations driven by oil prices often influence credit demand, investment activity, and financial sector stability.

Inflation

Inflation represents another critical macroeconomic variable affecting bank profitability. Moderate inflation may increase interest margins if banks can adjust lending rates accordingly. However, high or volatile inflation generally creates negative consequences. Inflation increases operating expenses, raises uncertainty, reduces real purchasing power, and may weaken borrower repayment capacity. In addition, rapid inflation often leads to higher credit risk and increased provisioning requirements. Kazakhstan has experienced several periods of elevated inflation during the past decade. These episodes created challenges for banks by increasing funding costs, reducing consumer confidence, and generating uncertainty within financial markets. Therefore, inflation is generally expected to have a negative relationship with bank profitability.

2.4 Bank-Specific Determinants

In addition to macroeconomic factors, several bank-specific characteristics influence profitability.

Bank size is commonly measured using total assets or the logarithm of total assets. Larger banks generally enjoy economies of scale that allow them to operate more efficiently than smaller institutions.

Large banks benefit from:

- Lower average operating costs.
- Better diversification opportunities.
- Greater access to financial markets.
- Stronger technological capabilities.
- Enhanced brand recognition.

These advantages enable large institutions to generate higher profitability while maintaining lower risk levels.

Furthermore, large banks possess greater financial resources for technological investments. The implementation of AI systems often requires substantial expenditures on infrastructure, data management, software development, and employee training. Consequently, larger institutions are typically better positioned to capitalize on AI-driven transformation.

2.5 Ethical Challenges of AI in Banking

Despite its numerous benefits, AI adoption raises important ethical concerns that cannot be ignored.

Algorithmic Bias

AI systems learn from historical data. If historical data contain discriminatory patterns, algorithms may reproduce or even amplify these biases. In lending decisions, biased algorithms may unfairly disadvantage certain groups of customers. Such outcomes undermine fairness and can damage institutional reputation.

Bias may emerge due to:

- Incomplete datasets.
- Historical discrimination.
- Poor model design.
- Lack of monitoring mechanisms.

Banks therefore face significant responsibility in ensuring that AI systems operate fairly and transparently.

Lack of Transparency

Many advanced AI models function as "black boxes." Although they may generate highly accurate predictions, their decision-making processes are often difficult to explain.

This lack of transparency creates challenges for:

- Customers seeking explanations.
- Regulators conducting oversight.
- Bank managers evaluating model performance.

Explainable AI has therefore become an increasingly important area of research and regulatory attention.

Data Privacy

AI systems require large quantities of customer information.

Banks collect data regarding:

- Income.
- Transactions.

- Spending behavior.
- Investment preferences.
- Credit history.

The extensive use of personal information raises concerns regarding privacy, consent, and data security.

Failure to protect sensitive information may result in reputational damage, financial losses, and legal consequences.

2.6 Legal and Regulatory Challenges

The increasing use of AI has prompted regulators worldwide to reconsider existing financial regulations.

Traditional banking regulations were developed primarily for human decision-making processes. AI introduces new challenges that existing frameworks may not adequately address.

Key regulatory concerns include:

- Model accountability.
- Algorithmic transparency.
- Consumer protection.
- Data governance.
- Cybersecurity.
- Operational resilience.

International frameworks increasingly emphasize explainability and accountability in automated decision-making systems. For Kazakhstan, regulatory modernization represents an important priority. Although significant progress has been achieved in digital transformation, comprehensive AI-specific regulations remain under development.

Future regulatory frameworks should provide clear guidance regarding:

- AI governance standards.
- Risk management procedures.
- Model validation requirements.
- Consumer rights.
- Data protection obligations.

3. RESEARCH METHODOLOGY

3.1 Research Design

This study employs a quantitative research design based on panel data analysis. The objective is to evaluate the impact of AI adoption on bank profitability while controlling for macroeconomic and institution-specific factors.

Panel data methodology combines cross-sectional and time-series dimensions, making it particularly suitable for banking research. This approach allows researchers to analyze variations across banks and over time simultaneously.

The study covers the period from 2014 to 2023 and focuses on four major commercial banks operating in Kazakhstan.

3.2 Data Sources

The empirical analysis utilizes data obtained from:

- Refinitiv Eikon
- Refinitiv Datastream
- Financial statements of selected banks
- Macroeconomic statistics for Kazakhstan

These sources provide reliable and internationally recognized financial information.

3.3 Variables

Dependent Variables

Return on Assets (ROA)

ROA measures the efficiency with which banks utilize assets to generate profits.

Return on Equity (ROE)

ROE evaluates profitability relative to shareholders' equity.

Independent Variables

AI Adoption

Measured using a dummy variable:

1 = AI adopted

0 = AI not adopted

GDP Growth

Annual percentage growth rate of Kazakhstan's economy.

Inflation

Annual consumer price inflation.

Bank Size

Natural logarithm of total assets.

3.4 Macroeconomic Environment: Kazakhstan, 2014–2023

The period 2014–2023 captures several major economic shocks and recovery phases that significantly affected Kazakhstan’s banking sector. GDP growth and inflation varied substantially during the decade, making them important control variables in the profitability model.

Year	GDP Growth (%)	Inflation (%)
2014	4.2	6.7
2015	1.2	13.6
2016	1.1	14.6
2017	4.1	7.1
2018	4.3	6.0
2019	4.5	5.3
2020	-2.5	6.9

2021	4.3	8.0
2022	3.3	14.5
2023	4.8	9.8

The table shows pronounced macroeconomic volatility. The oil-price collapse and exchange-rate adjustment in 2015–2016 sharply reduced growth and pushed inflation above 13%. The economy recovered during 2017–2019, contracted during the COVID-19 shock in 2020, rebounded in 2021, and then experienced another inflation surge in 2022. Because banking profitability responds strongly to economic cycles, inflation, and credit quality, controlling for these variables is essential for isolating the effect of AI adoption.

3.5 Econometric Model

The empirical analysis is based on a fixed-effects panel-data model:

$$\textbf{Profitability}_{it} = \alpha + \beta_1 AI_{it} + \beta_2 GDP_t + \beta_3 Inflation_t + \beta_4 \ln(Assets_{it}) + \mu_i + \varepsilon_{it}$$

Where **Profitabilityit** is either ROA or ROE for bank **i** in year **t; AIit** is the AI-adoption dummy; **GDPt** and **Inflationt** are annual macroeconomic indicators; **ln(Assetsit)** measures bank size; **μi** captures bank-specific fixed effects; and **εit** is the error term.

The fixed-effects specification is appropriate because banks differ in relatively stable characteristics such as governance quality, risk culture, customer structure, and technological maturity. These unobserved factors may be correlated with AI adoption and profitability; fixed effects remove this source of bias by focusing on within-bank changes over time.

3.6 Estimation Strategy and Robustness Checks

Three methodological safeguards are applied to strengthen inference:

- **Fixed-effects estimation:** Controls for unobserved, time-invariant bank characteristics that could bias coefficient estimates.
- **Robust standard errors:** Correct for heteroskedasticity and improve the reliability of statistical significance tests.
- **Variance Inflation Factor (VIF) diagnostics**: Assess multicollinearity among explanatory variables. Results indicate that VIF values remain within acceptable thresholds, suggesting that coefficient estimates are not distorted by harmful correlation between GDP, inflation, bank size, and AI adoption.

Collectively, this estimation strategy aligns with standard econometric practice in banking profitability research and is designed to produce stable and credible results.

4 EMPIRICAL RESULTS

4.1 Regression Results: ROA as the Dependent Variable

Variable	Coefficient	p-value	Interpretation
AI_Dummy	+0.014	0.032	AI adoption increases ROA
GDP	+0.142	0.004	Economic growth improves profitability
Inflation	−0.021	0.089	Inflation reduces profitability
ln(Assets)	+0.008	0.014	Larger banks perform better

The ROA model shows that AI adoption is associated with an average increase of 1.4 percentage points in ROA, holding other factors constant. Because banking ROA values are typically small, this represents a meaningful improvement in operational efficiency. The effect is statistically significant at the 5% level, supporting the hypothesis that AI adoption increases profitability.

GDP growth has a strong positive effect on ROA: a one-percentage-point increase in GDP growth raises ROA by approximately 0.142 percentage points. This reflects higher loan demand, better borrower solvency, and improved asset quality during economic expansion. Inflation has the expected negative sign and is significant at the 10% level, indicating that inflationary episodes tend to compress margins and weaken asset quality. Bank size also exhibits a positive and significant effect, consistent with economies of scale.

a. Regression Results: ROE as the Dependent Variable

Variable	Coefficient	p-value	Interpretation
AI_Dummy	+0.042	0.018	AI significantly boosts ROE
GDP	+0.33	0.012	Positive macroeconomic impact
Inflation	−0.08	0.071	Negative pressure on ROE
ln(Assets)	+0.017	0.044	Scale benefits enhance ROE

The ROE model reveals a substantially larger AI effect than the ROA model. AI adoption increases ROE by about 4.2 percentage points on average, suggesting that AI contributes strongly to shareholder value through cost reductions, improved risk management, and revenue enhancement. The effect is statistically significant at the 5% level. GDP growth again exerts a strong positive influence, while inflation has a negative effect that is significant at the 10% level.

The coefficient on bank size is positive and significant, indicating that larger banks are able to convert scale advantages into higher returns on equity.

b. Comparison of ROA and ROE Results

Variable	ROA Coefficient	ROE Coefficient	Key Insight
AI_Dummy	+0.014	+0.042	AI effect is much stronger for ROE
GDP	+0.142	+0.33	Macroeconomic growth boosts shareholder returns more than asset efficiency
Inflation	−0.021	−0.08	Inflation harms ROE more strongly than ROA
ln(Assets)	+0.008	+0.017	Scale advantages are more pronounced for ROE

The comparative analysis shows that ROE reacts more strongly than ROA to all explanatory variables. AI adoption, economic growth, and bank size generate disproportionately larger improvements in shareholder returns, while inflation imposes a more severe burden on ROE. These findings support the hypothesis that AI adoption has a stronger effect on ROE than on ROA.

4.4 Robustness Analysis

Robustness checks indicate that coefficient signs remain stable under heteroskedasticity-robust standard errors. The significance of AI, GDP, and bank size is preserved across specifications, while inflation consistently retains its expected negative sign. VIF diagnostics confirm that multicollinearity is not a material concern, and the fixed-effects specification effectively absorbs unobserved bank-level heterogeneity. Together, these checks suggest that the results are statistically reliable and economically meaningful.

5. DISCUSSION

The empirical evidence indicates that AI adoption has become a strategic determinant of banking performance in Kazakhstan. The positive effect on ROA suggests that AI improves operational efficiency through automation, faster processing, and better resource allocation. The much larger effect on ROE implies that AI also enhances shareholder value by strengthening revenue generation, reducing credit losses, and improving risk-adjusted returns.

The results further highlight the importance of macroeconomic conditions. Economic expansion increases lending activity, improves borrower solvency, and raises banking profits, whereas inflation creates operational and credit-related pressures. This is particularly relevant for Kazakhstan, where commodity cycles and external shocks continue to influence financial sector performance.

Bank size emerges as another important determinant. Larger banks appear better able to absorb the fixed costs of AI implementation, invest in digital infrastructure, and leverage data at scale. This finding suggests that smaller institutions may need alternative strategies such as partnerships with fintech firms, outsourced AI solutions, or shared infrastructure models.

6. ETHICAL, LEGAL, AND REGULATORY IMPLICATIONS

6.1 Ethical Risks

AI systems can unintentionally reproduce historical biases embedded in training data. In banking, biased models may affect credit approval, pricing, or customer treatment. Institutions therefore need governance frameworks that include bias testing, fairness monitoring, and human oversight.

Transparency is another challenge. Complex machine learning models may generate accurate predictions while offering limited explainability. This creates difficulties for customers seeking justification, regulators conducting supervision, and managers validating model behavior. Explainable AI techniques should therefore be integrated into high-stakes banking applications.

Data privacy is equally critical. AI relies on large volumes of customer information, increasing exposure to unauthorized access, misuse, or security breaches. Strong data governance, access controls, encryption, and consent management are necessary to maintain trust and compliance.

6.2 Legal and Regulatory Gaps

Current banking regulations were largely designed for human decision-making processes. AI introduces new questions regarding accountability, model risk, auditability, and consumer protection. Kazakhstan has advanced rapidly in digitalization, but comprehensive AI-specific banking regulations remain under development.

Priority areas for regulatory modernization include:

- AI governance and accountability standards.
- Requirements for model validation and ongoing monitoring.
- Rules for explainability in automated decisions.

- Data protection and customer-consent obligations.
- Cybersecurity and operational resilience requirements.

6.3 Policy Recommendations

Based on the findings, several policy directions are recommended.

For banks:

1. Establish dedicated AI governance committees with clear accountability structures.
2. Implement explainable AI frameworks for credit, risk, and compliance models.
3. Conduct regular bias testing and model validation exercises.
4. Strengthen cybersecurity controls and data-governance policies.
5. Invest in staff training to build internal AI capabilities.

For regulators:

1. Develop AI-specific supervisory guidance for financial institutions.
2. Create regulatory sandboxes that allow controlled experimentation with AI applications.
3. Define minimum standards for transparency, auditability, and model-risk management.
4. Enhance coordination between financial, data-protection, and cybersecurity authorities.
5. Align national AI governance with emerging international best practices.

7. CONCLUSION

This study examined the impact of AI adoption on the profitability of major Kazakhstani banks during 2014–2023 using a fixed-effects panel-data framework. The results show that AI adoption has a positive and statistically significant effect on both ROA and ROE, with a substantially stronger impact on ROE. GDP growth positively influences profitability, while inflation exerts negative pressure. Larger banks benefit from economies of scale and appear better positioned to capitalize on AI investments.

The findings indicate that AI is not merely an operational technology but a strategic capability that can enhance shareholder value and strengthen competitive positioning. At the same time, responsible AI deployment requires attention to fairness, transparency, data protection, cybersecurity, and regulatory oversight. For Kazakhstan, the next stage of financial-sector digitalization should combine technological innovation with governance modernization to ensure that AI-driven banking remains profitable, trustworthy, and resilient.

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Fact-Checking on Social Media in Kazakhstan (2017–2025): A Structured Narrative Literature Review

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1. INTRODUCTION

1.1 The Rise of misinformation in the digital information environment

Misinformation, disinformation, and related forms of deceptive communication have become defining challenges of public discourse in the digital age. Although false information has always existed, recent years have witnessed a marked intensification in its scale, speed, and sophistication, driven by the expansion of social media platforms, advances in artificial intelligence, and the increasing use of data-driven political and commercial communication (Posetti & Matthews, 2018; Wardle & Derakhshan, 2017). Platforms optimized for engagement tend to reward speed, virality, and emotional resonance, often amplifying sensational or polarizing content over carefully verified information (Lim et al., 2025). As a result, misleading or false claims can reach large audiences before journalists, public institutions, or fact-checking organizations are able to respond.

This transformation is not simply a matter of increased quantities of false content circulating online; it reflects a broader restructuring of the contemporary information environment. Wardle and Derakhshan (2017) conceptualize this through the framework of information disorder, which distinguishes among misinformation, disinformation, and malinformation. Misinformation refers to false or inaccurate information shared without intent to harm. Disinformation refers to false information deliberately created and disseminated to mislead. Malinformation, by contrast, involves the strategic use of genuine information in harmful or manipulative ways, such as selective disclosure, misleading framing, or the release of private material to damage reputations or distort public understanding (Wardle & Derakhshan, 2017).

Within this altered environment, fact-checking has emerged as a key institutional response. It has evolved from a corrective journalistic practice into a distinct verification function aimed at restoring epistemic credibility in digital communication environments (Graves, 2018). In this study, the term “fake news” is treated not as a universal umbrella label but as a narrower subtype of disinformation: fabricated or heavily distorted content that imitates the style of legitimate journalism in order to mislead audiences (Tandoc, Lim, & Ling, 2018).

1.2 Global and Regional Context: Fake News, Platform Logics, and Fact-Checking (2017–2025)

Between 2017 and 2025, the global discussion of misinformation shifted from isolated concern about viral falsehoods to a broader recognition that platform logics, political communication strategies, and audience vulnerabilities jointly shape the circulation of misleading content. The international literature increasingly demonstrates that misinformation is sustained by the interaction of algorithmic amplification, emotional salience, networked repetition, and declining trust in traditional gatekeepers (Bakshy et al., 2015; Vosoughi et al., 2018; Bennett & Livingston, 2018). Fact-checking emerged within this context as both a corrective practice and a

broader democratic defense mechanism, although its effectiveness has been shown to be conditional rather than universal (Walter et al., 2020; Lewandowsky et al., 2020).

Regional and post-Soviet contexts complicate this picture further. In hybrid media environments, the circulation of misinformation is shaped not only by platform incentives but also by legal ambiguity, uneven media freedom, and the strategic use of both legacy and networked channels by state and non-state actors. These conditions make it analytically insufficient to treat misinformation as a purely technological or cognitive problem. Instead, the broader regional literature suggests that misinformation must be examined as a problem embedded in political structure, media governance, and institutional trust (Guriev & Treisman, 2019; Greitens, 2020).

1.3 Kazakhstan as a Hybrid and Digitally Intensive Information Environment

Kazakhstan presents a particularly important case for studying misinformation and fact-checking because it combines high levels of digital connectivity with a politically constrained and linguistically segmented media environment. The country's social-media ecosystem is highly developed, with widespread use of Instagram, YouTube, TikTok, WhatsApp, and Telegram, creating a setting in which platform-based information flows are central to public communication (DataReportal, 2024). At the same time, the national information environment is shaped by state influence, uneven press freedom, and the coexistence of Kazakh- and Russian-language information spheres that do not always distribute content or corrective information in identical ways (Freedom House, 2023; Reporters Without Borders, 2024).

This linguistic dimension is particularly important for younger users, whose platform use is often intensive but whose access to high-quality, consistently fact-checked content may vary across languages and platforms (DataReportal, 2024; Akseiit & Kabdugaliev, 2023; Karimova et al., 2023; Tolegen et al., 2025). As a result, Kazakhstan should not be treated as a peripheral extension of Western misinformation research. It constitutes a substantively distinct case in which platform concentration, governance constraints, and language segmentation interact in ways that may shape both misinformation exposure and the reach of corrective efforts.

1.4 State Policy, Media Freedom, and the Regulation of False Information

Kazakhstan's information environment is further shaped by the interaction of media governance and regulatory practice. Importantly, Kazakhstan does not rely on a single, clearly defined 'fake news law.' Instead, regulation is distributed across several legal instruments (Tekenova, 2019; Reporters Without Borders, 2024). This matters because the absence of a single, transparent regulatory framework can produce interpretive uncertainty, making it difficult to distinguish between legitimate anti-disinformation efforts and broader restrictions that may affect journalists, civil society actors, or independent verification initiatives.

In practice, the reviewed literature suggests that legal ambiguity interacts with wider media-freedom constraints to create a context in which misinformation is not necessarily eliminated but may be displaced into less visible spaces. This has direct implications for fact-checking: when contentious claims circulate in private or semi-private environments, they become harder to observe, verify, and correct. The policy context is therefore not merely background; it is part of the structural configuration within which misinformation and fact-checking operate.

1.5 Conceptual and Theoretical Framework

This thesis is anchored primarily in the information disorder framework developed by Wardle and Derakhshan (2017). That framework is particularly useful because it moves the analysis beyond the simplistic language of 'fake news' and allows the study to distinguish among misinformation, disinformation, and malinformation as analytically distinct phenomena. It provides the study's primary conceptual vocabulary for classifying the kinds of problematic information that circulate within Kazakhstan's social-media environment.

At the same time, the thesis adopts the hybrid media system perspective as a complementary analytical lens. Chadwick's (2013) framework is valuable because it shifts attention from the classification of content to the interaction of media logics, institutional actors, and power relations across old and new media forms. In Kazakhstan, misinformation and fact-checking do not operate within a purely networked or purely legacy environment. They emerge at the intersection of state-aligned media, social platforms, private messaging channels, and independent verification initiatives. Fact-checking in this context therefore functions as a site of interaction between competing media logics, institutional constraints, and audience trust (Chadwick, 2013; Bennett & Livingston, 2018; Guriev & Treisman, 2019).

The conceptual hierarchy of the thesis is therefore explicit. Information disorder serves as the primary framework for classifying and understanding misleading content. The hybrid media system serves as a complementary interpretive lens for understanding how that content circulates, how it is contested, and why fact-checking may face structurally uneven conditions in Kazakhstan.

1.6 Problem Statement

Despite the growing visibility of misinformation on social media in Kazakhstan and the emergence of local fact-checking initiatives such as Factcheck.kz, there remains limited empirical understanding of how fact-checking operates within the country's hybrid media system. Existing scholarship has paid greater attention to the presence of disinformation, media governance, and audience vulnerability than to fact-checking itself as an institutional practice. As a result, there is still no integrated account of how fact-checking functions in Kazakhstan across the structural, institutional, and societal levels.

This gap is significant because fact-checking in Kazakhstan appears to operate under multiple, overlapping constraints. Politically, legal ambiguity, limited press freedom, and broad state powers over information create uncertainty and may encourage self-censorship (Freedom House, 2023; Reporters Without Borders, 2024). Technologically, fact-checking must compete on platforms whose algorithms prioritize engagement rather than accuracy, often disadvantaging corrective content (Tandoc, Zheng, & Ling, 2019; Walter et al., 2020). Socially, uneven media literacy and fragile trust in institutions raise doubts about whether fact-checking reaches intended audiences or meaningfully changes beliefs and behaviors (UNESCO, 2025; Demoscope, 2022).

Importantly, misinformation in Kazakhstan is not limited to anonymous online users. False or misleading claims may also originate from political elites, public officials, businesses, and institutional actors. The Kazakhstan-focused literature indicates that local fact-checking can contest claims made by public and institutional actors using publicly available evidence, which underscores the public relevance of verification in politically sensitive contexts (Seitzhanova & Sultanova, 2021; Akseiit & Kabdugaliev, 2023; Karimova et al., 2023; Akkalieva, 2025).

The literature therefore reveals a clear analytical problem: although misinformation in Kazakhstan is increasingly visible and fact-checking initiatives are present, there is still no comprehensive Kazakhstan-specific account of how social media fact-checking operates—what

kinds of claims are checked, how legal and political constraints shape verification practices, and how audiences perceive and engage with corrective content.

1.7 Purpose of the Study

The purpose of this study is to examine how fact-checking functions on social media in Kazakhstan between 2017 and 2025 and to assess what the existing literature suggests about its role in countering misinformation within a politically constrained yet highly digitalized media environment. By focusing on platform dynamics, audience trust, media literacy, and regulatory constraints, the study addresses a context that remains underrepresented in the broader scholarship on misinformation and fact-checking.

1.8 Research Questions

To guide the review, the study addresses three research questions:

RQ1. What patterns and dominant forms of misinformation are documented in Kazakhstan's social-media news environment between 2017 and 2025?

RQ2. What is known about fact-checking actors, verification practices, and the influence of legal and political constraints in Kazakhstan?

RQ3. What evidence exists regarding audience reach, trust, and the effectiveness of fact-checking interventions in Kazakhstan's platform-dominated environment?

1.9 Significance of the Study

This study is significant for three reasons. First, it addresses a clear empirical gap in Kazakhstan-focused scholarship by shifting analytical attention from misinformation as a general phenomenon to fact-checking as a specific institutional and communicative response. Second, it contributes to broader misinformation scholarship by testing how global theories of information disorder and fact-checking travel into a hybrid media system characterized by political constraint, uneven media freedom, and high digital platform dependence. Third, it offers a structured synthesis that may be useful for scholars, media practitioners, and policy observers interested in the conditions under which fact-checking can function meaningfully in politically sensitive and platform-dominated environments.

1.10 Overview of methodological approach

Methodologically, the thesis employs a structured narrative literature review that synthesizes peer-reviewed scholarship, policy analyses, monitoring reports, and publicly available materials from local fact-checking initiatives, particularly Factcheck.kz. Sources were identified through keyword searches in major academic databases and targeted retrieval of institutional reports from reputable organizations such as UNESCO, Freedom House, IREX, OECD, and OSCE, alongside Kazakhstan-specific contextual materials. The review is organized around three analytical dimensions—platform dynamics and information circulation, fact-checking actors and governance constraints, and trust, media literacy, and audience reception—which correspond to the study's three-level analytical framework (structural, institutional, and societal). This design enables a systematic narrative synthesis of both global and Kazakhstan-specific literature and provides the basis for a multi-level interpretation of how fact-checking operates in a hybrid media system.

Because the Kazakhstan-specific literature is strongest at the structural and institutional levels and considerably thinner at the audience level, the study anticipates from the outset that the answer to RQ3 will necessarily be more cautious and evidentially limited than the answers to RQ1 and RQ2.

2. LITERATURE REVIEW

2.1 Scope and Composition of the Reviewed Literature

This chapter critically reviews the scholarly and institutional literature on which the thesis draws. Unlike Chapter 4, which uses this literature to construct findings about Kazakhstan, the present chapter evaluates the literature in its own right: what it has established, where scholars disagree, how strong the underlying evidence is, and where its limits lie. This critical orientation is necessary because the conclusions that can be drawn about Kazakhstan depend heavily on the quality, distribution, and assumptions of the available sources.

The review synthesizes 54 sources published between 2017 and 2025, combining peer-reviewed academic scholarship with a limited number of high-value institutional and policy reports. The source base is intentionally mixed because the Kazakhstan-specific literature, although growing, remains methodologically concentrated in a small number of national journals, making selective use of credible grey literature and national-language scholarship methodologically necessary (Adams, Smart, & Huff, 2017; Snyder, 2019). The literature clusters into three broad domains: information disorder and digital circulation; fact-checking as an institutional practice; and the Kazakhstan context, including governance, legal regulation, media literacy, and exposure to misinformation. Within the third domain, the review draws on a substantial body of Kazakhstan-focused peer-reviewed scholarship that constitutes the emerging national research base on fact-checking, media literacy, and disinformation (Freedman & Karimova, 2018; Freedman, 2020; Akseiit & Kabdugaliev, 2023; Karimova et al., 2023; Ibraiymov et al., 2025).

2.2 Information Disorder and Platform Logics

The foundational literature on misinformation increasingly treats the problem as systemic rather than episodic. Wardle and Derakhshan (2017) provide the most widely used conceptual distinction among misinformation, disinformation, and malinformation, allowing scholars to move beyond the analytically imprecise category of ‘fake news.’ This distinction remains useful because it clarifies that not all problematic information is false in the same way or circulated for the same purpose.

At the same time, platform-centered scholarship demonstrates that the circulation of misleading content depends heavily on platform design and incentive structures. Bakshy et al. (2015) and Vosoughi et al. (2018) show that algorithmic distribution, social endorsement, and rapid recirculation can create conditions in which false claims achieve disproportionate visibility. This literature is important for the present thesis because it establishes that the problem is not merely the existence of false content but the infrastructural conditions that reward its spread.

In politically restrictive or hybrid settings, these platform logics interact with governance conditions. The broader comparative literature suggests that misinformation in such environments is shaped not only by algorithmic amplification but also by institutional opacity, selective enforcement, and constrained media pluralism (Bennett & Livingston, 2018; Greitens, 2020; Guriev & Treisman, 2019). This is especially relevant for Kazakhstan, where the circulation of

information is influenced by both platform architecture and a politically managed media environment.

2.3 Fact-Checking as an Institutional Practice

The literature on fact-checking has evolved from studies of campaign journalism and political accountability toward a broader analysis of verification as a distinct institutional practice. Graves (2018) is especially important here because it conceptualizes fact-checking not simply as a genre of journalism but as a specialized epistemic intervention that claims authority through transparency, sourcing, and methodological rigor.

At the same time, the empirical literature on fact-checking effects remains mixed. Meta-analytic and experimental research suggests that corrections can reduce belief in false claims under some conditions, but those effects vary according to prior attitudes, source trust, repetition, and the timing of exposure (Walter et al., 2020; Lewandowsky et al., 2020). This matters because the mere existence of fact-checking does not guarantee public influence.

Importantly, the dominant fact-checking literature remains concentrated in English-language and largely democratic or semi-democratic settings. As a result, the conditions under which fact-checking operates in non-Western, politically constrained, or hybrid media systems remain comparatively underdeveloped in the mainstream literature (Amazeen, 2015; Graves, 2018; Walter et al., 2020). This creates a clear rationale for examining the Kazakhstan case more closely.

2.4 Kazakhstan-Specific Literature

The Kazakhstan-focused literature reviewed for this thesis can be grouped into three substantive evidentiary domains. First, a cluster of studies addresses media governance, legal regulation, and the broader political conditions of public communication. These sources are crucial because they show that misinformation and fact-checking in Kazakhstan cannot be understood outside the context of media regulation, institutional trust, and state influence.

Second, a growing body of national scholarship addresses fact-checking, verification, and journalistic responses to misinformation. This literature is particularly important because it documents the emergence of local fact-checking as a recognizable practice, discusses evolving verification routines, and provides the most direct Kazakhstan-specific evidence for how organized correction is understood and performed.

Third, a related body of work addresses media literacy, post-truth dynamics, and audience vulnerability. This cluster is less methodologically robust than the institutional literature but remains analytically important because it helps frame the conditions under which corrections are likely to be received, trusted, or ignored. Yessimova and Yertassova (2024) address post-truth dynamics, while Yessimova and Ashirbekova (2025) extend this discussion to election-period information disorder.

A small number of references in the wider source base remain more useful as contextual or supporting materials than as central evidentiary anchors. For that reason, the thesis prioritizes convergence across multiple Kazakhstan-specific sources rather than relying heavily on isolated or weakly documented claims.

2.5 Critical Gaps and Implications for This Thesis

Taken together, the reviewed literature establishes that Kazakhstan is not absent from the emerging scholarship on misinformation, but the existing evidence remains unevenly distributed. Structural and institutional dimensions are better represented than audience-level effects. National scholarship is growing, but it is concentrated in a relatively small set of journals and often remains descriptive. Direct audience-level evidence on correction effectiveness remains especially limited.

This thesis responds to that interconnected set of gaps by organizing its synthesis around the interaction of structural, institutional, and societal levels, rather than reviewing each in isolation (Snyder, 2019; Ferrari, 2015). That choice is methodologically justified because the Kazakhstan case is not best explained by a single-variable model. Instead, the reviewed literature suggests that platform conditions, governance constraints, institutional capacity, and audience reception are mutually shaping factors.

The critical implication is that the study does not treat Kazakhstan merely as an illustrative national case appended to a global literature. Rather, it uses the Kazakhstan case to test how far the dominant frameworks of information disorder and fact-checking travel into a hybrid media environment, and where they require refinement.

3. METHODOLOGY

3.1 Research Design

This thesis employs a structured narrative literature review as its primary research design. The design was selected because the study seeks to synthesize a heterogeneous body of evidence rather than estimate a pooled effect size or conduct a narrowly bounded systematic review. The Kazakhstan-specific literature on misinformation and fact-checking remains emerging, methodologically uneven, and distributed across multiple source types, including peer-reviewed journal articles, institutional reports, policy assessments, and contextual materials. A structured narrative review is therefore appropriate because it permits analytical rigor while retaining flexibility across different forms of evidence and different levels of evidentiary strength (Snyder, 2019; Ferrari, 2015).

A purely systematic review or meta-analysis would be too restrictive for the purposes of this thesis because the relevant evidence does not consist of a large, uniform body of comparable quantitative studies. Instead, the field combines conceptual scholarship on misinformation and information disorder, empirical studies on fact-checking, media freedom monitoring, policy and governance reports, and Kazakhstan-specific contextual materials. On this basis, the literature review is treated not as a general background chapter, but as the primary research method through which dispersed evidence on misinformation and fact-checking in Kazakhstan is systematically identified, evaluated, and synthesized (Snyder, 2019; Ferrari, 2015).

This approach is especially appropriate because the topic sits at the intersection of media and communication studies, political communication, journalism studies, media literacy, and digital governance. It also concerns a field in which relevant knowledge is not located exclusively in indexed academic journals. Kazakhstan-specific evidence is partly distributed across peer-reviewed national scholarship and partly across institutional and monitoring materials. A structured narrative review therefore provides the necessary balance between methodological transparency, analytical discipline, and contextual flexibility.

3.2 Analytic Dataset and Unit of Analysis

The analytic dataset consists of 54 sources published between 2017 and 2025, with earlier sources retained only where they function as foundational theoretical or methodological works necessary for framing the study. These sources include peer-reviewed academic articles, academic books or book chapters, institutional and policy reports, and a limited number of carefully selected contextual materials needed to situate the Kazakhstan case.

The study does not collect original empirical data through surveys, interviews, experiments, or content scraping. Instead, it analyzes existing scholarly and institutional materials in order to identify patterns, tensions, convergences, and gaps in the available evidence base. The unit of analysis is the individual source as an evidence-bearing document. Each source was examined for its contribution to one or more of the thesis's three analytical levels: structural, institutional, and societal. This design allows the study to trace patterns across a mixed evidence base while preserving transparency about where claims are strongest and where they remain more tentative (Snyder, 2019; Ferrari, 2015).

Although multiple source types are included, they are not treated as analytically equivalent. Peer-reviewed scholarship forms the primary analytical foundation, while grey literature is used selectively to provide contextual evidence where Kazakhstan-specific peer-reviewed literature is limited. This preserves a clear evidentiary hierarchy while allowing the study to remain responsive to the realities of an uneven regional research base.

3.3 Search Strategy

Source identification followed a structured, staged, and purposive search strategy designed to be transparent, targeted, and reasonably replicable. Following Snyder (2019) and Ferrari (2015), the review did not rely on ad hoc reading or incidental source collection. Instead, it combined academic database searches with targeted retrieval of high-value institutional materials.

Academic searches were conducted through Google Scholar, Scopus, Web of Science, EBSCO, and ProQuest. These were supplemented by focused searches of institutional repositories and report libraries, including UNESCO, Freedom House, IREX, OECD, OSCE, and Factcheck.kz. These additional searches were necessary because Kazakhstan-specific scholarship on misinformation and fact-checking remains underrepresented in major international indexing systems, and some of the most relevant contextual evidence is published as institutional reports rather than journal articles.

The search relied primarily on simple two-concept search strings linked by AND in order to maximize clarity and reproducibility. Representative search strings included: *"fact-checking" AND "Kazakhstan"; "disinformation" AND "Kazakhstan"; "Kazakhstan" AND "false information"; "media literacy" AND "Kazakhstan"; "fact-checking" AND "social media"; "verification" AND "journalism"; "social media" AND "information disorder"; "disinformation" AND "Central Asia";* and *"digital authoritarianism" AND "media literacy."*

The search proceeded in two stages. First, broader global search strings were used to establish the international theoretical and empirical baseline on misinformation, information disorder, platform logics, and fact-checking. Second, these were refined into more specific Kazakhstan-, Central Asia-, and post-Soviet-oriented searches to locate contextual and regionally relevant sources. This staged process allowed the study to combine international theoretical grounding with Kazakhstan-specific empirical context (Snyder, 2019; Adams et al., 2017).

3.4 Inclusion and Exclusion Criteria

To ensure consistency in source selection, clear inclusion and exclusion criteria were applied. Sources were selected on the basis of time range, thematic relevance, source type, and geographic applicability.

To be included, a source had to meet the following criteria:

1. It was published between 2017 and 2025, unless it was a foundational theoretical or methodological work necessary for framing the study;
2. It was directly relevant to one or more of the following themes: misinformation, disinformation, fact-checking, verification, media literacy, social media information flows, digital governance, or hybrid media systems;
3. It contributed either to the global conceptual framework of the thesis, the empirical and contextual understanding of Kazakhstan, or the comparative understanding of Central Asia or other hybrid media systems.

The review included three main source categories: peer-reviewed journal articles, academic books and book chapters, and carefully selected grey literature from reputable institutions. Grey literature was included only when it came from well-established organizations such as UNESCO, Freedom House, IREX, OECD, OSCE, or similarly credible entities, and only when it provided contextual evidence not readily available in the Kazakhstan-specific peer-reviewed literature (Adams et al., 2017).

Excluded materials included opinion pieces, unsubstantiated blog posts, advocacy materials without clear evidentiary basis, duplicative sources, methodologically opaque materials, and sources lacking a direct connection to the thesis topic. Comparative literature from outside Kazakhstan was retained only when it materially strengthened the theoretical or analytical framework of the study (Snyder, 2019; Adams et al., 2017).

3.5 Literature Extraction and Organization

After selection, the reviewed materials were organized into a standardized literature matrix. The purpose of this matrix was to move the review process from general reading to structured extraction and systematic comparison. Rather than collecting notes informally, each source was entered into a standardized extraction template to facilitate cross-source comparison (Snyder, 2019; Ferrari, 2015).

For each source, the matrix recorded: author(s), year, title, source type, empirical context, method, principal findings, analytical level, limitations, and relevance to the thesis. The category “empirical context” identified the actual country or setting examined, while the category “analytical level” classified each source as primarily structural, institutional, or societal, depending on whether it focused on platform and governance conditions, fact-checking actors and practices, or audience vulnerability and media literacy.

This extraction process served several purposes. It created a transparent record of the evidence base, distinguished conceptual from empirical sources, differentiated peer-reviewed scholarship from grey literature, and made patterns and gaps more visible, particularly where Kazakhstan-specific evidence was thin (Snyder, 2019). It also helped identify recurring weaknesses in the literature, such as overreliance on Western cases, limited longitudinal evidence, and the predominance of descriptive rather than impact-oriented Kazakhstan-specific materials.

3.6 Synthesis Strategy

The synthesis proceeded in two analytically connected stages. First, the literature was critically evaluated in Chapter 2 in order to assess the strength, distribution, limitations, and evidentiary quality of the source base. Second, the evaluated literature was reorganized in Chapter 4 into a structured findings chapter aligned with the thesis's three research questions and three analytical levels. This two-stage design preserves the distinction between literature evaluation and literature synthesis, which is central to the logic of the thesis.

Within this overall structure, the selected literature was synthesized thematically rather than chronologically. The purpose of the thesis is not to catalogue publications over time, but to identify the main analytical patterns in research on misinformation, fact-checking, and Kazakhstan's media environment. Both Snyder (2019) and Ferrari (2015) emphasize that strong literature reviews should move beyond source-by-source description and instead organize literature in a way that reveals patterns, tensions, and conceptual relationships.

Three thematic clusters emerged consistently from the literature matrix and were used to structure the analysis:

1. Platform dynamics and information circulation
2. Fact-checking actors, practices, and governance constraints
3. Trust, media literacy, and audience reception

These themes correspond directly to the study's three-level analytical framework: structural, institutional, and societal. The synthesis process therefore focused on identifying points of convergence, divergence, underdevelopment, and evidentiary asymmetry across the literature.

3.7 Source Credibility and Quality Control

Because this thesis includes both peer-reviewed scholarship and grey literature, explicit source credibility assessment was necessary. In review-based social science research, the inclusion of grey literature is methodologically defensible when handled transparently and selectively, especially in fields where peer-reviewed evidence is unevenly distributed across regions (Adams et al., 2017).

Peer-reviewed journal articles and scholarly publications form the primary analytical foundation of this study. Grey literature was included only from well-established organizations with recognized expertise in media, governance, digital rights, or public communication. These materials were used primarily for contextual support rather than as substitutes for peer-reviewed evidence.

The credibility of grey literature was assessed using four practical criteria:

1. Institutional credibility and transparency of the producer
2. Presence of evidence, data, or documented analysis
3. Direct relevance to the thesis topic and context
4. Ability to supplement rather than replace peer-reviewed scholarship (Adams et al., 2017; Snyder, 2019)

Where Kazakhstan-specific claims were especially important, the study prioritized convergence across multiple sources rather than relying on single-source assertions. This approach also helped reduce publication bias. In fields such as misinformation and fact-checking—particularly outside Western democracies—major databases may underrepresent local, negative, or context-specific findings. Selective inclusion of high-quality grey literature therefore helps

prevent the over-privileging of Western scholarship at the expense of Kazakhstan-specific realities.

3.8 Methodological Limitations

This methodological approach has several limitations that should be stated explicitly. First, as a structured narrative review, the study is interpretive by design. It synthesizes existing evidence rather than generating new empirical data, which means that its conclusions are bounded by the scope, quality, and distribution of the available literature (Ferrari, 2015; Snyder, 2019).

Second, the study addresses a rapidly evolving field. Misinformation practices, fact-checking routines, platform governance arrangements, and AI-related communication dynamics continue to change. As a result, the review captures the state of the evidence at the time of the search, rather than a fixed or final body of knowledge.

Third, the review relies primarily on English-language and internationally accessible materials. Although this improves cross-database consistency and verifiability, it may underrepresent literature published in Kazakh or Russian. This is especially important for a Kazakhstan-focused topic, where local perspectives may not always be translated or indexed internationally.

Fourth, the study is constrained by the limited availability of high-quality Kazakhstan-specific research. Much of the relevant evidence remains descriptive, institutionally produced, or non-longitudinal, which limits the strength of claims that can be made—particularly regarding audience reach, trust, and the effectiveness of fact-checking. Accordingly, the thesis makes stronger claims where cross-source convergence is robust and more cautious claims where the evidence remains limited.

These limitations do not invalidate the method. Rather, they define the scope of the study and clarify the evidentiary boundaries within which the conclusions should be interpreted.

4. FINDINGS

This chapter presents the synthesized findings of the structured narrative literature review. Whereas Chapter 2 evaluated the literature as a body of scholarship—assessing its consensus, disagreements, evidentiary strengths, and methodological limitations—this chapter performs a different task: it integrates that evaluated evidence to construct a specifically Kazakhstan-focused account of how misinformation and fact-checking function on social media between 2017 and 2025. The chapter is organized around the thesis's three-level analytical framework—structural, institutional, and societal—but its center of gravity is the Kazakhstan case. Each section therefore moves from the condensed general evidence established in Chapter 2 to the Kazakhstan-specific findings that constitute the thesis's main empirical contribution.

The chapter has two closely connected purposes. First, it answers the study's three research questions by identifying the dominant empirical patterns that emerge across the reviewed literature. Second, it integrates those answers into a multi-level explanatory configuration specific to the Kazakhstan case. This design is methodologically appropriate because the reviewed corpus is heterogeneous and because the Kazakhstan-specific literature is stronger in some areas than in others. As established in Chapter 2, the evidence is strongest for structural and institutional patterns and comparatively thinner at the societal level, particularly with regard to direct audience-level measurement. The findings are therefore presented accordingly: stronger claims are made where

cross-source convergence is robust, and more cautious claims are maintained where the evidence remains limited.

Before presenting the findings in detail, Table 1 summarizes the analytic composition of the reviewed literature as organized in the literature matrix described in Section 3.5. The table groups the 54 reviewed sources by research domain and analytical level, providing a transparent view of how the evidence base is distributed across the three-level framework and between global and Kazakhstan-specific scholarship.

Table 4.1.

Composition of the reviewed literature by research domain and analytical level (n = 54)

Research domain	**Analytical level**	**Representative sources**	**Principal contribution**
Information disorder & platform logics	Structural	Wardle & Derakhshan (2017); Vosoughi et al. (2018); Bakshy et al. (2015); Gillespie (2018); Tandoc et al. (2018, 2019); Posetti & Matthews (2018); Chesney & Citron (2019); Lewandowsky et al. (2020)	Conceptual framework; diffusion dynamics; algorithmic amplification; deepfake and post-truth dynamics
Fact-checking as institutional practice (global)	Institutional	Graves (2018); Amazeen (2015); Walter et al. (2020); Guess et al. (2019, 2020)	Professionalization; verification routines; meta-analytic evidence on conditional effectiveness
Political context & hybrid media systems	Structural / Institutional	Bennett & Livingston (2018); Guriev & Treisman (2019); Greitens (2020); Bennett & Segerberg (2013); Castells (2015); McCombs (2014); Shoemaker & Vos (2009)	Political economy of disinformation; networked public sphere; gatekeeping in hybrid systems
Kazakhstan governance & media environment	Structural / Institutional	Freedom House (2023); Reporters Without Borders (2024); IREX (2022); DataReportal (2024); Demoscope (2022); Tekenova (2019)	Press freedom; media sustainability; platform use; legal-regulatory architecture
Kazakhstan fact-checking practice	Institutional	Seitzhanova & Sultanova (2021); Akseiit & Kabdugaliev (2023); Karimova et al. (2023); Ibraiymov et al. (2025); Akkalieva (2025); Tolegen et al. (2025)	Development, routines, and evolution of Factcheck.kz and Stopfake.kz

Kazakhstan disinformation patterns	Structural	Aigelova & Ishanova (2023); Rakhymzhanova & Alzhan (2023); Sultanbayeva et al. (2022, 2024); Yessimova & Shevyakova (2024); Yessimova & Yertassova (2024); Yessimova & Ashirbekova (2025); Adalihan et al. (2025)	Event-contingent intensification (COVID-19, elections); emerging technical forms (deepfakes, generative AI)
Kazakhstan media literacy & education	Societal	Abueva, Buzelo, and Abuev (2025); Freedman (2020); Freedman & Karimova (2018); Guz (2018); UNESCO (2025)	Media-literacy provision; journalistic competence; youth vulnerability
Review methodology	Methodological	Snyder (2019); Ferrari (2015); Adams et al. (2017)	Narrative review design; grey-literature integration

Three patterns visible in Table 4.1 shape the synthesis that follows. First, the Kazakhstan-specific research literature now spans all three analytical levels, although its coverage remains strongest at the structural and institutional levels and thinnest at the societal level, especially regarding measured audience outcomes. Second, global and Kazakhstan-specific sources cluster differently across the framework: global scholarship provides the conceptual and methodological anchors, while Kazakhstan-focused scholarship supplies the empirical case material. Third, several domains draw on both peer-reviewed scholarship and credible institutional monitoring, reflecting the mixed-source rationale established in Chapters 2 and 3.

4.2 Structural Findings: Misinformation Circulation in Kazakhstan's Platform Environment

Building on the general claims about platform amplification, information disorder, and diffusion evaluated in Chapter 2, the synthesis identifies four structural features that shape misinformation circulation specifically in Kazakhstan. These are not simple restatements of the global literature. Rather, they are Kazakhstan-specific findings produced by integrating that literature with national evidence on connectivity, platform use, legal regulation, and language ecology. Together, these four features answer RQ1 by showing that the dominant forms and circulation dynamics of misinformation in Kazakhstan are structured by the interaction of platform architecture, governance conditions, and linguistic segmentation, rather than by content falsity alone.

The first structural feature is the combination of very high digital connectivity with concentrated use of a relatively small number of platforms. DataReportal (2024) documents internet penetration above 90 percent, heavy mobile dependence, and strong concentration of attention on Instagram, YouTube, TikTok, WhatsApp, and Telegram. This concentration intensifies the general diffusion dynamics identified in the wider literature because a limited number of channels carry a disproportionate share of everyday information flows. The Kazakhstan-specific finding is therefore not merely that misinformation travels quickly, but that it travels through a narrow set of channels with distinct affordances—algorithmic feeds on Instagram

and TikTok, and messaging infrastructures on WhatsApp and Telegram—that create uneven opportunities for both amplification and correction.

The second structural feature is regulatory displacement. The broader literature suggests that restrictive political environments may push problematic or politically sensitive content into less visible spaces (Bennett & Livingston, 2018; Guriev & Treisman, 2019). In Kazakhstan, the legal architecture described in earlier chapters—particularly the distributed regulation of false information and the analysis provided by Tekenova (2019)—supplies a concrete mechanism for such displacement. Public, searchable content carries greater visibility and potential legal risk; private and semi-private messaging spaces do not. The integrated finding is that Kazakhstan's regulatory environment appears less to eliminate misinformation than to redistribute it across a visibility gradient, with more politically sensitive claims moving toward channels where independent verification actors have weaker monitoring capacity. This conclusion should remain carefully bounded: the literature does not provide a direct national measurement of the displacement effect, but the convergence of legal, media-freedom, and platform-use evidence makes the pattern analytically persuasive.

The third structural feature is linguistic segmentation. Information circulates across Kazakh-language and Russian-language spheres that overlap but do not fully converge, producing partially parallel rather than fully shared information flows. This segmentation compounds platform fragmentation because users in each language sphere may encounter different sources, different influencers, and different verification pathways. The Kazakhstan-specific finding is that misinformation circulation is structured not only by platform affordances but also by language, which means that a correction produced in one language sphere may not reach, or may not be trusted by, audiences exposed to the original claim in the other. This linguistic dimension is particularly important because it links structural circulation patterns directly to the institutional and societal constraints developed later in the chapter.

The fourth structural feature is temporal asymmetry between circulation and correction. The general fact-checking literature consistently shows that corrections usually lag behind initial claims; Kazakhstan-specific conditions intensify this asymmetry. Demoscope (2022) indicates widespread routine exposure to disinformation, while Kazakhstan-focused studies document how false and misleading content spreads rapidly across local social-media networks and intensifies during high-salience periods such as COVID-19 and elections (Rakhymzhanova & Alzhan, 2023; Sultanbayeva, Gorbunova, & Lozhnikova, 2022; Yessimova & Ashirbekova, 2025). The small number of active fact-checking actors further means that the volume of content requiring verification exceeds verification capacity (Akseiit & Kabdugaliev, 2023; Karimova et al., 2023). The Kazakhstan-specific finding is therefore not only qualitative—engagement-driven content outcompetes verified content—but also quantitative and event-contingent: during periods of heightened political or public-health salience, the speed and volume of misinformation exceed the response capacity of the existing verification field.

A further structural observation is that the technical form of disinformation is evolving. Yessimova and Shevyakova (2024) document the emergence of deepfakes in Kazakhstan's information environment, while Adalihan, Skripnikova, and Shyngyssova (2025) raise the related question of generative AI and its implications for journalistic verification. These studies suggest that the structural configuration identified here is not static. The types of misinformation circulating through Kazakhstan's platform environment are becoming more technically sophisticated, which increases the burden on an already thinly resourced verification ecosystem.

Table 2

Structural features of misinformation circulation in Kazakhstan

Structural feature	Specific Kazakhstan manifestation	Key supporting evidence
Concentrated platform use	Over 90% internet penetration; information flows dominated by Instagram, YouTube, TikTok, WhatsApp, and Telegram; mobile-first consumption	DataReportal (2024); Aigelova & Ishanova (2023); Sultanbayeva et al. (2024)
Regulatory displacement	Legal risk attached to highly visible public content appears to redistribute politically sensitive claims toward messaging apps and semi-private spaces with weaker monitoring	Tekenova (2019); Freedom House (2023); Reporters Without Borders (2024)
Linguistic segmentation	Parallel Kazakh- and Russian-language information spheres produce different narrative flows and uneven access to verification	Tolegen et al. (2025); Karimova et al. (2023); Akseiit & Kabdugaliev (2023)
Temporal asymmetry	Volume and speed of misinformation outpace verification capacity, with event-contingent intensification during COVID-19 and elections; deepfakes and generative AI further compress response time	Rakhymzhanova & Alzhan (2023); Sultanbayeva, Gorbunova, & Lozhnikova (2022); Yessimova & Ashirbekova (2025); Yessimova & Shevyakova (2024); Adalihan et al. (2025)

Taken together, these four features constitute the Kazakhstan-specific structural finding: misinformation circulates through a platform environment characterized by concentrated platform use, regulatory displacement into less transparent channels, linguistic segmentation, and temporal asymmetry between claim and correction. Each feature connects to established claims in the broader literature, but their combination produces a distinctive structural configuration that cannot be adequately captured by any single theoretical strand alone.

This reconfiguration also suggests a partial shift from traditional gatekeeping, in which a small number of editorial actors determined what was publicly visible, toward what Bruns (2018) calls gatewatching, in which networked users—including fact-checkers—observe, curate, and contest claims as they circulate. In Kazakhstan, however, this shift remains incomplete. Gatewatching practices are visible but thinly distributed, and they coexist with older gatekeeping structures that continue to shape which claims receive institutional authority.

4.3 Institutional Findings: Fact-Checking Actors, Verification Practices, and Governance Constraints

The reviewed literature shows that fact-checking in Kazakhstan is present, professionally recognizable, and increasingly visible, but also institutionally limited. This finding answers RQ2 by demonstrating that Kazakhstan possesses identifiable fact-checking actors and verification routines, yet those actors operate within a constrained and relatively thin institutional field. The synthesis integrates the general literature on fact-checking professionalization and conditional effectiveness (Amazeen, 2015; Graves, 2018; Walter et al., 2020) with Kazakhstan-specific scholarship to identify four institutional findings.

The first institutional finding concerns actor concentration. The Kazakhstan-focused literature repeatedly identifies Factcheck.kz as the principal domestic fact-checking initiative and treats it as the clearest case through which national verification practice can be examined. Comparative analyses with Stopfake.kz help situate Kazakhstan within a broader post-Soviet verification environment, but they also reveal a structural limitation: fact-checking in Kazakhstan is not dispersed across a dense ecosystem of competing or complementary organizations. Instead, it is concentrated in a small number of visible actors, which increases their symbolic importance while simultaneously limiting institutional redundancy, scale, and resilience.

The second institutional finding concerns the professionalization of practice. The national literature documents recognizable verification routines, evolving verdict typologies, and a gradual movement away from rigid binary classifications toward more nuanced explanatory forms. This is analytically important because it indicates that fact-checking in Kazakhstan should not be dismissed as ad hoc corrective commentary. Rather, it has developed into a structured journalistic practice with identifiable norms of evidence use, claim evaluation, and public explanation. Seitzhanova and Sultanova (2021) trace the early institutionalization of Factcheck.kz, while Akseiit and Kabdugaliev (2023) and Karimova et al. (2023) provide comparative analyses of Factcheck.kz and Stopfake.kz, showing that both broadly follow verification routines consistent with international norms, even though they differ in thematic focus, linguistic scope, and institutional orientation. Ibraiymov, Kamzin, and Slamgazhy (2025) further document an evolution in verdict forms over time, from binary true/false classifications toward more nuanced explanatory judgments, which aligns with the international trend identified by Graves (2018).

The third institutional finding concerns governance constraints. The general literature treats legal and regulatory constraints as contextual variables; in Kazakhstan, they function as a central operating condition. Tekenova (2019) provides the most detailed domestic analysis of the legal architecture governing false information, demonstrating that Kazakhstan's approach combines criminal, communications, and administrative provisions without a single unified statute specifically addressing disinformation. The consequence is not only external pressure on publication but an implicit agenda effect: legal and political conditions appear to influence which claims are likely to be selected for verification in the first place. In other words, governance conditions shape not only what can be safely published but also what becomes visible within the fact-checking field.

The fourth institutional finding concerns scale, capacity, and institutional mismatch. The broader literature indicates that fact-checking is most effective when corrections are timely, credible, and well distributed (Walter et al., 2020). Kazakhstan's institutional environment meets these conditions unevenly. Timeliness is constrained by limited capacity; distribution is limited by the absence of large-scale platform partnerships of the kind available in some democratic contexts; and source credibility is complicated by the wider political environment. A further constraint appears in the journalism-education literature: Guz (2018) and Freedman and Karimova (2018) argue that fact-checking competencies are inconsistently embedded in Kazakhstani journalism education, which narrows the pipeline of professionally trained verification staff available to expand the field. The resulting institutional gap is therefore not a generic resource deficit, but a structured mismatch between the conditions that the literature identifies as necessary for impact and the conditions actually available in Kazakhstan.

Table 3

Comparative profile of the two-anchor fact-checking platforms in Kazakhstan as characterized in the reviewed national literature

Dimension	Factcheck.kz	Stopfake.kz
Primary thematic focus	Domestic public-interest claims, including statements by officials, policy issues, and viral social-media content	Claims in circulation across the post-Soviet information space, with attention to cross-border and foreign-origin narratives
Verification approach	Evidence evaluation, source triangulation, public-document comparison; evolution toward nuanced explanatory verdicts	Source verification with emphasis on debunking coordinated or recurring false narratives
Linguistic coverage	Russian- and Kazakh-language outputs, with uneven coverage across the two spheres	Primarily Russian-language, consistent with its broader post-Soviet scope
Documented evolution (2017–2025)	From institutional establishment toward a recognizable verification routine; shift from binary to explanatory verdicts	Continued activity within a broader regional network, with limited Kazakhstan-specific institutional development
Key documenting literature	Seitzhanova & Sultanova (2021); Akseiit & Kabdugaliev (2023); Karimova et al. (2023); Ibraiymov et al. (2025)	Akseiit & Kabdugaliev (2023); Karimova et al. (2023)

The comparative profile in Table 3 supports the broader institutional finding that Kazakhstan's fact-checking ecosystem is anchored by a small number of platforms with differentiated but complementary roles, and that the emerging national literature provides reasonably convergent accounts of each. The table also makes visible an important limitation: documentation of Stopfake.kz in the Kazakhstan-specific literature is considerably thinner than documentation of Factcheck.kz, which constrains how much can be said about the former with equal confidence.

Overall, the institutional-level synthesis is that fact-checking in Kazakhstan functions as a professionally meaningful but institutionally under-resourced practice, operating within governance conditions that actively shape both its agenda and its reach. This is a sharper claim than the general literature supports on its own, and it is specific to the Kazakhstan case.

4.4 Societal Findings: Audience Reach, Trust, and the Effectiveness of Fact-Checking

The societal level is the point at which the Kazakhstan-specific evidence base is thinnest, as established in Chapter 2. The reviewed literature does not provide a robust body of Kazakhstan-specific audience experiments, longitudinal surveys, or direct measures of correction effects. Strong causal claims are therefore not supported. Nevertheless, by combining the general literature on reception, media literacy, and trust with the limited Kazakhstan-specific evidence available, the synthesis supports three cautiously stated societal findings. These findings answer RQ3 while preserving explicit awareness of the evidentiary asymmetry between the three analytical levels.

The first societal finding is an exposure–correction gap specific to the Kazakhstan information environment. Demoscope (2022) and DataReportal (2024) together indicate that Kazakhstani users encounter misinformation frequently and across multiple platforms, while the institutional findings developed in Section 4.3 indicate that corrective content is produced by a smaller number of actors and does not necessarily achieve equivalent reach, speed, or repetition. This does not mean that corrections never circulate effectively; rather, it means that the structure of exposure favors the original claim more consistently than the correction. The Kazakhstan-specific finding is that the gap between exposure and correction is not incidental but structurally generated: it follows directly from the concentrated platform use, regulatory displacement, and linguistic segmentation identified at the structural level.

The second societal finding is a youth literacy paradox. Younger audiences are among the most digitally active and platform-dependent groups in Kazakhstan, which might superficially suggest higher informational competence. However, the reviewed literature indicates that digital fluency should not be conflated with critical evaluation capacity. UNESCO (2025) identifies uneven media and information literacy provision in Kazakhstan, while Kazakhstan-focused scholarship on journalism education and media literacy reinforces this pattern from a different angle. Abueva, Buzelo, and Abuev (2025) frame media literacy as a central institutional countermeasure against disinformation and describe its national implementation as fragmentary. Freedman (2020), Freedman and Karimova (2018), and Guz (2018) document pedagogical gaps in the teaching of fact-checking and critical evaluation within Kazakhstani higher education. Combined with the broader literature on the distinction between digital fluency and epistemic resilience (Lewandowsky et al., 2020), the integrated finding is that Kazakhstan exhibits a familiar but sharpened paradox: high engagement does not automatically translate into proportionate critical capacity, and the educational infrastructure needed to narrow that gap remains underdeveloped.

A further dimension relevant to the thesis's hybrid-media framing is linguistic hybridity. Narratives in Kazakhstan do not circulate within a single language community but move across Kazakh- and Russian-language segments of the information environment, often carrying different inflections, implied audiences, and levels of perceived credibility. The same claim can therefore acquire different evidentiary weight and different degrees of contestation depending on which linguistic segment of the hybrid system it enters. This compounds the reception problem because fact-checking responses produced in one language sphere may not reach—or may not be trusted by—audiences whose primary exposure occurred in the other.

The third societal finding is that trust functions as a limiting condition rather than a background variable. The broader fact-checking literature shows that corrections are more likely to work when the correcting source is perceived as credible, independent, and timely (Walter et al., 2020). In Kazakhstan, however, media freedom constraints, politicized interpretations of public information, and uneven institutional trust complicate the reception of corrective content. Freedom House (2023) and Reporters Without Borders (2024) document constrained media independence, while the Kazakhstan-focused literature suggests that perceptions of the independence and authority of fact-checking actors are uneven across audience segments (Karimova et al., 2023; Akkalieva, 2025; Tolegen et al., 2025). The Kazakhstan-specific finding is therefore that fact-checking does not merely need to be accurate and visible; it must establish credibility in an environment where institutional trust is fragile and where verification sources may themselves be interpreted through a political lens. This is a qualitatively different reception condition than the one assumed in much of the broader literature.

The societal-level synthesis is therefore deliberately bounded. The thesis can support the claim that audience reach, trust, and the likely effectiveness of fact-checking in Kazakhstan are constrained by a structurally generated exposure–correction gap, uneven media literacy, and fragile trust. It cannot support a strong claim that fact-checking has or has not produced measurable belief change at scale in Kazakhstan, because the direct national evidence for such a claim is not yet available.

4.5 Integrated Multi-Level Findings: The Reinforcing Pattern in the Kazakhstan Case

The central integrated finding of this review is that the three analytical levels do not operate independently in the Kazakhstan case. Rather, they reinforce one another in ways that compound the challenge of countering misinformation. This is the thesis's primary synthetic contribution and the sense in which the Kazakhstan case is not merely illustrative but analytically distinctive.

At the structural level, concentrated platform use, regulatory displacement, linguistic segmentation, and temporal asymmetry generate misinformation circulation patterns that exceed the monitoring and response capacity of the institutional field documented in Section 4.3. At the institutional level, the thinness of the fact-checking ecosystem and the influence of governance constraints limit the speed, reach, and perceived independence of the corrections that are produced. At the societal level, the exposure–correction gap, youth literacy paradox, and trust deficit shape whether the corrections that do reach audiences are accepted, ignored, or resisted.

Each level therefore feeds back into the others. Limited institutional reach reinforces structural asymmetry by producing fewer and later corrections. Audience skepticism reduces the practical impact of institutional outputs and may weaken incentives for institutional expansion. Linguistic and platform fragmentation at the structural level reduce the marginal return on any single corrective intervention. The result is cumulative rather than additive. The challenge in Kazakhstan is not misinformation alone, nor fact-checking capacity alone, nor audience vulnerability alone, but the mutual reinforcement of all three.

The implication is that fact-checking in Kazakhstan is possible, professionally practiced, and publicly valuable—and yet systematically outmatched. This is a more specific and more context-sensitive claim than the general literature supports on its own, and it is the integrative finding that the three-level framework was designed to make visible.

4.6 Direct Answers to the Research Questions

Section 4.5 established the integrated multi-level pattern that emerges across the findings. The present section makes that logic explicit by mapping the synthesized evidence directly onto the three research questions. Table 4 summarizes the integrated answers, their evidentiary bases, and their relationship to the three analytical levels.

4.6.1 Answer to Research Question 1: Patterns and dominant forms of misinformation in Kazakhstan (2017–2025)

The integrated structural findings in Section 4.2 support four specific patterns in the Kazakhstan case. First, misinformation circulates through a concentrated set of platforms dominated by Instagram, YouTube, TikTok, WhatsApp, and Telegram. Those messaging applications carry a disproportionate share of politically sensitive claims as a result of regulatory displacement (Yessimova & Ashirbekova, 2025). Second, it is linguistically segmented across

Kazakh- and Russian-language spheres, producing parallel rather than fully shared information flows. Third, it exhibits an event-contingent temporal asymmetry in which the volume and speed of circulation routinely outpace the capacity of verification infrastructure during high-salience periods such as pandemics (Rakhymzhanova & Alzhan, 2023) and elections (Kaldybekova et al., 2025; Sultanbayeva et al., 2022). Fourth, it includes technically evolving content forms, including deepfakes and generative-AI-assisted material (Adalihan et al., 2025, Yessimova & Shevyakova, 2024). The Kazakhstan-specific pattern is therefore not simply more misinformation, but a distinctive structural configuration in which platform, regulatory, linguistic, and technological conditions jointly shape how misinformation circulates.

4.6.2 Answer to Research Question 2: Fact-checking actors, practices, and the influence of legal and political constraints in Kazakhstan

The integrated institutional findings in Section 4.3 indicate that fact-checking in Kazakhstan is present, professionally recognizable, and operationally constrained. A small number of actors—most visibly Factcheck.kz and Stopfake.kz—apply verification practices broadly consistent with international norms (Seitzhanova & Sultanova, 2021; Akseiit & Kabdugaliev, 2023; Karimova et al., 2023), and the field has evolved toward more nuanced explanatory verdicts rather than rigid binary classifications (Ibraiymov et al., 2025). The ecosystem nevertheless lacks the density, funding base, and platform partnerships documented in better-resourced environments (Freedman, 2020; Freedman & Karimova, 2018). Legal and political constraints influence not only what can be safely published but what is likely to be selected for verification in the first place. Tekenova (2019) analyzed the building of an implicit agenda effect anchored in the distributed legal architecture. Relative to the conditions for effective fact-checking identified in the meta-analytic literature (Walter et al., 2020), Kazakhstan meets the conditions of timeliness, source credibility, and distribution unevenly, which bounds the expected impact of fact-checking independently of the quality of the verification work itself.

4.6.3 Answer to Research Question 3: Audience reach, trust, and effectiveness of fact-checking interventions in Kazakhstan

The Kazakhstan-specific evidence base on reception is limited, and strong causal claims are not supported. The integrated societal findings in Section 4.4 nevertheless support three substantive conclusions. First, audience reach is structurally constrained. The exposure–correction gap follows from the structural and institutional conditions identified in Sections 4.2 and 4.3, not from audience behavior alone. Second, media literacy is unevenly distributed and does not reliably track digital engagement, with younger audiences showing a characteristic paradox of high platform use but variable critical evaluation capacity (Abueva et al., 2025; Freedman, 2020; Freedman & Karimova, 2018; Guz, 2018; UNESCO, 2025). Third, trust operates as a limiting condition rather than a background variable. Corrections in Kazakhstan must establish credibility within a broader media environment in which institutional trust is fragile and politically inflected. The overall answer is therefore that fact-checking can plausibly influence audience understanding in Kazakhstan, but it operates within reception conditions that cap its effective reach and that cannot be resolved through verification practice alone.

Table 4

Research questions, integrated Kazakhstan-specific findings, and evidentiary base

Research question	Integrated Kazakhstan-specific finding	Principal evidentiary base	Analytical level
RQ1. Patterns and dominant forms of misinformation in Kazakhstan (2017–2025)	Concentrated platform use, regulatory displacement into less transparent channels, linguistic segmentation, and event-contingent temporal asymmetry, now extending to deepfakes and generative-AI content	DataReportal (2024); Tekenova (2019); Rakhymzhanova & Alzhan (2023); Sultanbayeva et al. (2022, 2024); Yessimova & Shevyakova (2024); Yessimova & Ashirbekova (2025); Adalihan et al. (2025)	Structural
RQ2. Fact-checking actors, verification practices, and legal-political constraints	Professionally recognizable practice anchored by Factcheck.kz and Stopfake.kz; evolving verdict forms; implicit agenda effect produced by distributed legal architecture; conditions for effectiveness met unevenly	Seitzhanova & Sultanova (2021); Akseiit & Kabdugaliev (2023); Karimova et al. (2023); Ibraiymov et al. (2025); Tekenova (2019); Akkalieva (2025); Tolegen et al. (2025); Walter et al. (2020)	Institutional
RQ3. Audience reach, trust, and effectiveness of fact-checking	Structurally generated exposure–correction gap; youth literacy paradox sharpened by dual-language use and uneven pedagogical provision; trust as a limiting rather than background variable	Demoscope (2022); UNESCO (2025); Abueva, Buzelo, & Abuev (2025); Freedman (2020); Freedman & Karimova (2018); Guz (2018); Karimova et al. (2023); Walter et al. (2020); Lewandowsky et al. (2020)	Societal

Table 4 makes visible the integrated logic of the three research-question answers. Each research question is answered by drawing on a combination of Kazakhstan-specific and general sources, and the analytical-level column shows how the three answers together span the structural, institutional, and societal levels of the framework. The table also clarifies an important limitation: the answer to RQ3 rests more heavily on contextual Kazakhstan-specific literature and global reception research than on direct audience measurement in the Kazakhstan case, which is fully consistent with the evidentiary limits established in Chapter 2.

This chapter has integrated the evidence evaluated in Chapter 2 with Kazakhstan-specific sources to produce a structured, multi-level account of how misinformation and fact-checking function in Kazakhstan between 2017 and 2025. The structural synthesis identifies a specific configuration of platform concentration, regulatory displacement, linguistic segmentation, and temporal asymmetry. The institutional synthesis identifies a fact-checking practice that is professionally recognizable but institutionally thin, and shaped by governance conditions that influence even its visible agenda. The societal synthesis identifies an exposure–correction gap, a

youth literacy paradox, and a trust deficit that together condition how corrective content is received.

The chapter's central contribution is the integrated finding that these three levels reinforce one another in the Kazakhstan case. Fact-checking in Kazakhstan should therefore be understood not as a practice that is adequate or inadequate in isolation, but as one whose effectiveness is bounded by a structured set of conditions operating simultaneously at platform, institutional, and audience levels. The interpretive implications of this multi-level reinforcing pattern are developed in Chapter 5.

5. DISCUSSION

This chapter interprets the findings presented in Chapter 4 in relation to the study's conceptual framework, the broader scholarly literature reviewed in Chapter 2, and the methodological boundaries established in Chapter 3. While Chapter 4 organized the synthesized evidence around the thesis's three-level analytical framework—structural, institutional, and societal—this chapter moves beyond description to assess what these findings mean for understanding fact-checking in Kazakhstan's hybrid media environment.

The discussion develops five main arguments. First, misinformation in Kazakhstan should be understood as a structural problem shaped by platform logics, legal ambiguity, and media hybridity. Second, fact-checking in Kazakhstan is professionally recognizable but institutionally thin. Third, audience reception is conditioned by uneven media literacy, linguistic segmentation, and fragile trust. Fourth, the three levels reinforce one another, producing cumulative constraints on fact-checking effectiveness. Fifth, the Kazakhstan case refines the information disorder framework by showing that, in hybrid media systems, misinformation and correction are shaped not only by content and platforms but also by governance, institutional capacity, and audience trust.

5.1 Interpreting the Structural Findings: Platform Logics in a Hybrid Media System

The findings confirm that misinformation in Kazakhstan is not merely a content problem but a structural one, embedded in the design and incentive architecture of digital platforms. This is consistent with the broader literature on platform amplification (Vosoughi et al., 2018; Bakshy et al., 2015) and with the information disorder framework (Wardle & Derakhshan, 2017), which emphasizes that the conditions of circulation—not only the falsity of individual claims—determine the severity of information disorder.

However, the Kazakhstan context adds an important dimension that the predominantly Western literature does not fully address. In liberal democratic settings, the structural advantage of misinformation is usually discussed in terms of algorithmic amplification, speed, engagement incentives, and emotional salience. In Kazakhstan, a second structural layer is present: the regulatory and political environment actively shapes which claims circulate openly, which are displaced into less transparent spaces, and which remain uncontested due to self-censorship. The displacement of misinformation into private messaging platforms and semi-private networked spaces suggests that regulatory pressure does not eliminate false information but may redistribute it into environments where fact-checking is more difficult (Tekenova, 2019; Freedom House, 2023; Reporters Without Borders, 2024; DataReportal, 2024; Demoscope, 2022).

This finding has theoretical implications. The information disorder framework developed by Wardle and Derakhshan (2017) is powerful for classifying types of problematic content, but it is less developed as a framework for analyzing the political and institutional conditions that determine which forms of disorder become visible, which remain hidden, and which can be safely corrected. The Kazakhstan case suggests that in hybrid media systems, information disorder should be interpreted in relation to regulatory structure and media governance, not only content typology.

The hybrid media system framework helps sharpen this point. Kazakhstan's case supports the view that misinformation and correction circulate through interacting media logics rather than through a single platform ecology. Older broadcast and institutional logics continue to shape public authority, while newer networked logics enable rapid circulation through social media, messaging applications, and platform-native formats. Fact-checking must therefore operate across a mixed environment where visibility, authority, and risk are unevenly distributed (Chadwick, 2013; Bennett & Livingston, 2018; Guriev & Treisman, 2019; Greitens, 2020).

This means that the structural advantage of misinformation in Kazakhstan cannot be resolved through platform reform alone. The problem is not simply that platforms reward fast and emotionally engaging content. It is also that legal ambiguity and political constraint influence where claims circulate, which actors can contest them, and whether corrections can travel through the same channels as the original misinformation. Kazakhstan's structural environment therefore reveals a hybrid configuration in which platform incentives and governance conditions jointly shape the circulation of misinformation (Chadwick, 2013; Tekenova, 2019).

5.2 Interpreting the Institutional Findings: Fact-Checking as a Thin Field

The institutional findings indicate that fact-checking in Kazakhstan is best understood as a thin field rather than as a fully consolidated ecosystem. The reviewed literature does not support the conclusion that fact-checking is absent. On the contrary, it shows that Kazakhstan has developed visible and professionally recognizable verification practices, centered primarily on Factcheck.kz and interpreted through a growing national scholarly literature (Seitzhanova & Sultanova, 2021; Akseiit & Kabdugaliev, 2023; Karimova et al., 2023; Ibraiymov et al., 2025; Akkalieva, 2025; Tolegen et al., 2025).

At the same time, institutionalization remains incomplete and fragile. The concentration of organized verification in a small number of actors means that fact-checking carries symbolic importance without possessing broad organizational density. A highly visible actor may perform meaningful public verification, but it cannot substitute for a wider ecosystem of multiple outlets, strong platform partnerships, stable funding, routine citation by mainstream media, and durable organizational redundancy.

The Kazakhstan case therefore extends rather than contradicts the broader literature on fact-checking institutionalization. Graves (2018) shows how fact-checking can develop recognizable professional authority, and the Kazakhstan evidence supports that claim. However, the local literature also shows that professionalization does not automatically produce institutional depth. In Kazakhstan, fact-checking is professionally meaningful but structurally under-resourced, which helps explain why it remains visible yet limited in reach and systemic influence (Graves, 2018; Walter et al., 2020).

The governance dimension further sharpens this interpretation. Fact-checking in Kazakhstan operates under conditions where legal ambiguity, low press freedom, and self-censorship shape not only the environment in which corrections circulate but also the boundaries of what can be contested. This means that institutional weakness is not simply a matter of funding, staffing, or

technological capacity. It is also a function of the wider political conditions that define the risks and constraints of verification itself (Freedom House, 2023; Reporters Without Borders, 2024; Tekenova, 2019).

Read through the hybrid media system lens, Kazakhstan's fact-checking initiatives occupy a complex institutional position. They combine elements of traditional journalistic verification—evidence checking, source comparison, document analysis, and public accountability—with platform-native forms of distribution, including visual explainers, social-media posts, and short-format content. This dual orientation is not incidental. It is how resource-constrained verification actors attempt to reach audiences who no longer rely exclusively on traditional gatekeepers while still producing content that remains evidentially defensible by journalistic standards.

The institutional interpretation, therefore, is not that Kazakhstan lacks fact-checking. Rather, it is that Kazakhstan has fact-checking practice without a fully developed fact-checking field. This distinction is important. Practice refers to the existence of recognizable verification work; field refers to the broader organizational density, funding stability, professional autonomy, platform partnerships, and public legitimacy that allow fact-checking to operate at scale (Akkalieva, 2025; Graves, 2018).

5.3 Interpreting the Societal Findings: Audience Reception in a Low-Trust Environment

The societal findings are the most evidentially limited, but they remain analytically important. The reviewed literature does not provide strong Kazakhstan-specific causal evidence on whether fact-checking changes beliefs or behaviors at scale. What it does provide is a coherent pattern suggesting that audience-level effectiveness is conditioned by an exposure–correction gap, uneven media literacy, linguistic segmentation, and fragile trust.

The exposure–correction gap is particularly important. Kazakhstani users appear to encounter misinformation in high-volume, high-velocity digital environments, while corrective content is produced by a smaller number of actors and is less likely to achieve equivalent repetition, speed, or reach. This is consistent with both national contextual evidence and the broader literature showing that the conditions under which people encounter corrections are often less favorable than the conditions under which they encounter the original false claim (DataReportal, 2024; Demoscope, 2022; Walter et al., 2020).

The youth literacy paradox complicates simplistic assumptions about digital competence. Younger users may be highly active on digital platforms while still depending on unevenly developed media-literacy provision and variable exposure to verification cultures. Digital fluency should therefore not be mistaken for evaluative resilience. Media literacy remains necessary, but its effectiveness depends on contextual adaptation to platform habits, linguistic diversity, and the realities of how information circulates locally (Abueva, Buzelo, & Abuev, 2025; Freedman, 2020; Freedman & Karimova, 2018; Guz, 2018; UNESCO, 2025;).

Linguistic hybridity further complicates audience reception. Narratives in Kazakhstan do not circulate within a single language community but move across Kazakh- and Russian-language segments of the information environment. A claim may acquire different meanings, levels of credibility, or degrees of contestation depending on the language sphere in which it appears. This creates a reception challenge for fact-checking: a correction produced in one language sphere may not reach, or may not persuade, audiences whose primary exposure occurred in another.

Trust is the third major societal condition. The broader fact-checking literature suggests that corrections are more effective when the correcting source is perceived as legitimate, credible, and independent (Walter et al., 2020). In Kazakhstan, however, audience trust cannot be treated as a

neutral background factor. It is shaped by broader perceptions of media credibility, institutional independence, and the political sensitivity of public information. As a result, the question is not only whether corrections are accurate, but whether audiences regard the correcting actor as sufficiently trustworthy for the correction to matter (Akkalieva, 2025; Lewandowsky et al., 2020; Tolegen et al., 2025).

These societal-level findings suggest that improving fact-checking effectiveness in Kazakhstan requires attention not only to the quality and accuracy of corrections but also to the conditions of reception. Building audience trust, strengthening media literacy, and ensuring that corrective content reaches diverse audiences across linguistic and platform boundaries are necessary complements to the institutional development of fact-checking organizations (Lewandowsky et al., 2020; UNESCO, 2025).

5.4 Multi-Level Interpretation: The Reinforcing Pattern

The most important contribution of the thesis lies in the multi-level interpretation developed across Chapters 4 and 5. The structural, institutional, and societal dimensions do not merely coexist; they interact in ways that cumulatively limit the effectiveness of fact-checking in Kazakhstan.

At the structural level, platform concentration, regulatory displacement, linguistic segmentation, and temporal asymmetry create conditions in which misinformation circulates rapidly across fragmented spaces, while corrective content faces visibility disadvantages (DataReportal, 2024; Tekenova, 2019; Rakhymzhanova & Alzhan, 2023). At the institutional level, fact-checking organizations lack the capacity to respond at comparable speed or scale, and their operating environment introduces additional political and legal constraints (Akseiit & Kabdugaliev, 2023; Karimova et al., 2023; Freedom House, 2023; Seitzhanova & Sultanova, 2021). At the societal level, uneven media literacy and fragile institutional trust reduce the likelihood that available corrections will be encountered, understood, or accepted (Akkalieva, 2025; Tolegen et al., 2025; UNESCO, 2025).

This reinforcing pattern is the central explanatory contribution of the thesis. Structural conditions increase the speed and visibility of misinformation. Institutional thinness limits the scale, frequency, and reach of corrective responses. Societal conditions then reduce the probability that corrections will be encountered, trusted, or acted upon. The result is cumulative disadvantage. Fact-checking in Kazakhstan is not failing because it is professionally weak; it is constrained because it is operating within a layered environment that systematically favors the persistence of misinformation.

This interpretation is theoretically important because it extends the information disorder framework into a non-Western hybrid media context. It also demonstrates the value of combining information disorder with the hybrid media system lens. The first framework clarifies the types and logics of problematic content; the second clarifies how those forms circulate through a politically managed and platform-dominated environment. Together, they make it possible to see why the Kazakhstan case is not reducible either to a platform problem or to a censorship problem alone (Bennett & Livingston, 2018; Chadwick, 2013; Walter et al., 2020; Wardle & Derakhshan, 2017).

The implication is that interventions at a single level are unlikely to be sufficient. Strengthening fact-checking institutions will have limited effect if platform structures continue to disadvantage corrective content or if audiences lack the trust and literacy to engage with

corrections. Similarly, improving media literacy will have limited value if corrective information is not produced, not visible, or not trusted. An effective response to misinformation in Kazakhstan therefore requires coordinated attention to all three levels: platform structure, institutional capacity, and audience reception.

5.5 Theoretical Contribution and Comparison with Literature

This study makes three theoretical contributions to the existing scholarship. First, it confirms the continued usefulness of the information disorder framework as a classification tool while showing that the framework requires contextual extension when applied in politically constrained hybrid media systems. The typology of misinformation, disinformation, and malinformation remains useful, but the Kazakhstan case demonstrates that classification alone is insufficient. Researchers must also examine the political and regulatory conditions that shape how information disorder becomes visible, circulates, and is contested (Wardle & Derakhshan, 2017).

Second, the study demonstrates that the hybrid media system lens is not merely supplementary in the Kazakhstan case; it is necessary for explaining how misinformation and correction circulate under conditions of state influence, platform concentration, linguistic segmentation, and uneven visibility. The Kazakhstan case supports Chadwick's (2013) claim that contemporary media systems cannot be understood through a simple opposition between old and new media. In Kazakhstan, state-aligned media, social platforms, messaging applications, independent verification actors, and official regulatory frameworks interact continuously.

Third, the study contributes to the emerging literature on fact-checking in non-Western and hybrid media systems by systematically identifying the conditions under which fact-checking is likely to be visible yet structurally disadvantaged. The Kazakhstan case supports the broader international finding that fact-checking can be professionally meaningful but conditionally effective. At the same time, it adds a sharper account of how regulatory pressure, linguistic segmentation, institutional thinness, and fragile trust intensify those conditions in a hybrid media environment (Akkalieva, 2025; Tolegen et al., 2025; Walter et al., 2020).

In this sense, the thesis does not reject the dominant literature; it refines it. It shows that global frameworks travel to Kazakhstan, but only if they are adapted to account for governance conditions, institutional fragility, and audience reception in a politically constrained and platform-intensive media system.

5.6 Practical and Policy Implications

The findings of this study carry several practical implications. For fact-checking organizations in Kazakhstan, the analysis suggests that strengthening institutional capacity—particularly in staffing, technological tools, multilingual reach, and platform distribution—is necessary but not sufficient. What matters is not only the production of corrections but their ability to circulate visibly across the platforms and language communities where misinformation travels.

For policymakers, the findings highlight the risk that broad and ambiguously defined legal provisions on false information may inadvertently suppress legitimate verification while failing to address the structural conditions that allow misinformation to spread. A more enabling regulatory environment—one that protects rather than constrains independent verification—would be more likely to strengthen the public role of fact-checking (Tekenova, 2019; Freedom House, 2023; Reporters Without Borders, 2024).

For educators and media-literacy advocates, the analysis suggests that interventions should be adapted to Kazakhstan's specific platform and linguistic environment. Programs that address

only general critical evaluation skills are unlikely to be sufficient. More effective interventions would also need to address platform-specific literacy, private-messaging dynamics, algorithmic amplification, and dual-language information flows (Abueva et al., 2025; Freedman, 2020; Freedman & Karimova, 2018; Guz, 2018 UNESCO, 2025).

The broader implication is that countering misinformation in Kazakhstan cannot be reduced to one policy domain. Strengthening fact-checking organizations without addressing legal ambiguity and media literacy would leave the field vulnerable. Expanding media literacy without strengthening independent verification would leave audiences with limited access to credible corrections. Reforming regulation without improving institutional capacity would also be insufficient. The thesis therefore points toward a multi-level response that corresponds to the multi-level structure of the problem.

5.7 Limitations and Directions for Future Research

The conclusions of this study must be interpreted within the boundaries established by the methodology. As a structured narrative literature review, the study synthesizes existing evidence rather than generating new empirical data. This means that the findings are constrained by the scope, quality, and availability of the reviewed sources, as discussed in Chapter 3. The reliance on English-language and internationally indexed materials may also have excluded relevant Kazakh- and Russian-language scholarship that could provide additional perspectives on audience behavior, institutional dynamics, or regulatory practice (Adams et al., 2017; Ferrari, 2015; Snyder, 2019.

Moreover, the Kazakhstan-specific evidence base remains uneven. The study identifies patterns and plausible mechanisms, but it cannot establish strong causal relationships between structural conditions, institutional practices, and audience outcomes. The reinforcing multi-level pattern developed in this thesis is analytically persuasive, but it requires empirical validation through primary research. This is especially true for RQ3, where direct audience-level evidence remains the thinnest.

Several directions for future research follow from these limitations. Primary audience surveys, experiments on correction effects, and in-depth organizational case studies would strengthen the evidence base substantially. Longitudinal work tracking changes in misinformation patterns, fact-checking capacity, and audience responses over time would also help address the current literature's relative staticity. Finally, comparative research across Central Asia and the broader post-Soviet space would clarify which features of the Kazakhstan case are distinctive and which are shared across comparable hybrid media systems.

Conclusion

This study set out to examine how fact-checking functions on social media in Kazakhstan between 2017 and 2025 and to assess its role in countering misinformation within a politically constrained yet highly digitalized media environment. Through a structured narrative literature review of 54 sources, the study has shown that misinformation in Kazakhstan is not merely a content problem but a structural, institutional, and societal challenge.

The findings demonstrate that misinformation benefits from a double structural advantage: platform logics that reward speed and engagement, and a regulatory environment that may displace

rather than eliminate false content. Fact-checking has emerged as a visible and professionally grounded response, but it operates under significant institutional constraints and faces an audience environment characterized by uneven media literacy, linguistic segmentation, and fragile trust.

The central contribution of this thesis is the identification of a reinforcing pattern across these three levels. Platform amplification, institutional fragility, and audience vulnerability interact in ways that cumulatively limit the effectiveness of fact-checking, even where individual initiatives demonstrate professional competence and public value. Addressing this challenge requires coordinated attention to structural conditions, institutional capacity, and audience reception—a conclusion that both affirms and extends the information disorder framework into a non-Western hybrid media context.

Fact-checking in Kazakhstan is necessary, visible, and professionally meaningful. But it is not yet sufficient to counterbalance the structural and societal conditions that sustain misinformation. Strengthening its effectiveness will require not only better verification practices but also a more enabling regulatory environment, stronger institutional foundations.

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I hereby declare that this submission is my own work and to the best of my knowledge it contains no materials previously published or written by another person, or a substantial proportion of material which have been submitted for the award of any other degree at KIMEP University or any other educational institution, except where due acknowledgment is made in the thesis. This thesis is the result of my own independent work, except where otherwise stated, and the views expressed here are my own.

Signed:

Date:

Human Capital Inequality and the Gender Wage Gap: Ten Determinants of Labor Market Disparities

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Abstract

Gender wage inequality remains one of the most persistent manifestations of labour market disparities worldwide. While human capital differences are frequently cited as the primary explanation, growing evidence suggests that wage gaps emerge from a broader interaction between individual endowments, labour market structures, and institutional constraints. This systematic literature review (SLR) examines the determinants of the gender wage gap from a human capital inequality perspective.The study identifies 1,267 publications across Scopus, Web of Science, and Google Scholar, from which 63 peer-reviewed articles were selected following a rigorous multi-stage screening process. Based on this synthesis, ten key determinants of the gender wage gap are classified into three analytical clusters: Human capital endowments, structural labour market mechanisms, institutional and cultural determinants. The findings demonstrate that gender wage inequality cannot be explained solely by observable productivity-related characteristics. Instead, wage disparities arise from the processes governing the formation, allocation, and pricing of human capital within labour market institutions. Institutional and structural factors significantly influence both the utilization of human capital and the returns paid for it. By integrating fragmented strands of literature into a coherent classification framework, this study provides a conceptual foundation for subsequent empirical modelling and evidence-based policy design aimed at reducing labour market inequality.

Key words: gender wage gap; wage discrimination; occupational segregation; human capital; wage determinants

Introduction

Inequality in human capital is a major channel of labor market disparities between countries and within countries over time. The disparities in education, skills, work experience, occupations, and institutional barriers that individuals face affect not only the time profile of individual incomes but also the distribution of income. The gender wage gap is another manifestation of inequality in which men are paid more than women for comparable work, and the common explanation for the wage gap is that women have less human capital than men. However, recent research suggests that wage inequality can arise from more fundamental structural, cultural, and institutional factors that affect the endowment, allocation, and pricing of human capital (Kovaleva & Taylor, 2023a, 2023b; Kovaleva et al., 2025a, 2025b).

The gender wage gap is one of the most widely used indicators of labour market discrimination. However, the focus solely on the wage gap may obscure the processes that generate and perpetuate the disparities in human capital endowments. Human capital refers to the skills that constitute the endowment of workers. Recent empirical evidence from Kazakhstan and Kyrgyzstan demonstrates that patrilocal household structures and entrenched gender norms intensify female labor effort while simultaneously constraining career advancement and wage equality (Kovaleva,

Kudebayeva, & Pech, 2025). So that, human capital not limited to formal education and work experience but also includes constraints arising from household structures and gender norms that shape labor allocation decisions (Kovaleva & Taylor, 2023a). Rather, it is shaped by a range of factors including household composition, gender stereotypes, household decision-making structures, occupational segregation, informality and the broader institutional context. In this way, the endowment and productivity of human capital are shaped by the processes that form the endowment itself, as well as by the prices (returns) that workers earn for their human capital endowment.

Current review make use of recently available data on household structures and gender norms in Central Asia collected by Kovaleva, Taylor, Pech, and Madumarov (2025), which shed new light on how women allocate and utilize their human capital within patrilocal and extended household systems. Evidence from Central Asia indicates that different types of household structures and gender norms significantly affect women's time use in rural Kyrgyzstan. Empirical findings indicate that women living in patrilocally married extended households spend more time on domestic work, which has carry over effects on their labour market participation and potentially also on their inventive activity. Study also examine cultural and power-related factors affecting women's labor market outcomes and find that they are important for women's participation in the labour market and for the gender wage gap. This suggests that the gender wage gap is not driven solely by human capital and other measurable characteristics and that it is important to consider the broader social and institutional context in which wage discrimination occurs.

Also supporting the TOWD, the paper by Kovaleva and Taylor (2023a) applies the Theory of Households' Work Division to the impact of gender norms, gender inequality in the household and gender cultural bias on economic prices and their effects on work division within the household. In the paper referred to above, the authors empirically test the patrilocality hypothesis and present convincing evidence that, on average, women that live with their parents-in-law spend more time on market and non-market activities and their time allocations are different from those of women who do not live with their parents-in-law. Work and human capital choices today affect the potential workforce and skills of tomorrow. Evidence from Kazakhstan and Kyrgyzstan suggests that institutional constraints, rather than purely individual fertility decisions, play a decisive role in shaping female income trajectories (Kovaleva et al., 2025).

The purpose of this review is to examine labor market segmentation and human capital inequality in the context of COVID-19 pandemic. The concept of human capital inequality is traditionally focused on the household level. However, it is essential to extend this scope to labor market segmentation in the formal and informal sectors of employment. Based on recent research on labor market segmentation in Kazakhstan, it was found that wage gap between formal and informal self-employed workers has greatly increased during the COVID-19 period and the increase in wage gap has a large unexplained component (Musayir et al., 2026). Informality is closely related to the protection and valuation of human capital and therefore may lead to structural wage gaps.

Recent bibliometric evidence further shows that artificial intelligence and digital automation are increasingly reshaping labor reallocation patterns, affecting skill demand, job displacement, and workforce transformation, with gendered implications for access to emerging occupations (Samatova et al., 2025).

A host of factors influence decisions about fertility and demographics including the labor market. Prior research by Kovaleva, Taylor, Korosteleva, and Kudebayeva (2025) demonstrates that an increase in abortion rates in Kazakhstan and Kyrgyzstan was associated with lower female relative income which suggests that rather than the reproductive choice of women being the causal

factor in determining the economic outcomes, the extent of the institutional constraint on women in the labor market is a more important determinant. If lower relative income relative to men results from discrimination in the labor market and other market failures this confirms that the wage gap is a market failure issue and not one of the choices and behavior of women.

Recent empirical evidence suggests numerous potential channels through which human capital inequality may emerge. However, the current literature is highly fragmented. A number of studies have individually identified numerous channels, such as education, occupational segregation, discrimination, informality, and culture.

Despite a plethora of research on gender wage gap and labour market disparities, few studies investigated the determinants of labour market disparities underlying human capital inequality that lead to the gender wage gap. Therefore, this study contributes to the literature through a systematic literature review that identifies and classifies the key determinants of labor market disparities underlying human capital inequality. A total of 63 peer-reviewed studies were selected from an initial sample of 1,267 articles indexed in Scopus, Web of Science, and Google Scholar. This study reviewed the literature and identified and classified ten key determinants of labour market disparities underlying human capital inequality that lead to the gender wage gap, and proposed a framework of three categories.

- Human capital endowments (education, skills, labor market experience)
- Structural labor market mechanisms (occupational segregation, monopsony power, competition, informality)
- Institutional and cultural determinants (gender norms, leadership representation, household structure, discrimination)

Combining all the mentioned perspectives, the paper concludes that the gender wage gap is more than just a wage level phenomenon. Rather, it is a consequence of the way human capital is produced, allocated and traded in labour markets. The original findings of this study are most relevant to the field of work and family, and may provide a basis for further research into the determinants of labour market disparities.

Current study contributes to the literature in three ways. First, review provide a formal classification scheme that connects small events that occur at the household level to larger labor market institutions. Second, author interpret gender wage disparities as reflecting gender-based human capital disparities. Third, our paper offers a tool for studying the underlying structures of labor market discrimination and can therefore be viewed as a precursor to empirical studies and policy recommendations.

Methodology

This systematic literature review (SLR) adopts a structured approach to analysing existing research on the gender wage gap. The study commenced with a comprehensive search using Google Scholar, which yielded 1267 articles based on the following keywords: gender wage gap, gender wage inequality, gender pay gap, wage inequality by gender, gender earnings differentials, gender wage disparity, and pay inequality between men and women (Table 1).

To ensure relevance and recency, the abstracts of all retrieved articles were reviewed, and 217 of the most recent and thematically relevant studies were selected for further examination. Following a detailed evaluation of methodology, scope, and findings, a final set of 63 articles was included in this review (Table 1).

Stages	Reference status	Number of references
1. Identification	Initial entire references	1267
	Duplicates	-217
	Unrelated references	-578
	Number of references after cleaning	472
2. Screening	References that did not fit the requirements for inclusion	-255
	Number of eligibility references	217
3. Eligibility	References excluded based on critical evaluation	-154
	Final sample	**63**

Source: Authors' estimations based on SLR analysis

Table 1. Data selection process

The citations for each selected article were systematically organised in a dedicated database, categorised by thematic relevance, and grouped according to key determinants of the gender wage gap. This classification facilitated a structured synthesis of the findings, ensuring that theoretical perspectives on the determinants of the wage gap were effectively captured.

To guarantee transparency and replicability, the SLR was carried out in three phases: planning, literature search, and reporting.

It has been carried out systematically in several stages (Table 1):

1. The first stage was the **planning stage,** which involved a scoping database search using Scopus, Web of Science, and Google Scholar. Key search terms were identified, relevant sources were selected, and inclusion and exclusion criteria were defined.
2. The literature search stage involved screening and selecting studies based on titles and abstracts that met the inclusion criteria, resulting in a list of potential studies.
3. Then, a **critical appraisal** is conducted to assess these studies against the research questions, and the selection is further restricted to the final list of studies for synthesis.

Furthermore, **network analysis** was applied to identify co-occurrence patterns and relationships between studies, ensuring that all areas of the literature on the gender wage gap are systematically covered. By employing this rigorous selection process, this review offers a comprehensive and up-to-date synthesis of the key determinants of gender wage disparities while maintaining objectivity, methodological consistency, and thematic coherence in analysing the literature.

Findings

Education: a pathway to equality or a reinforcer of wage disparities?

Research around the world constantly observes the value of education. Current SLR review suggests that it is a widely held belief that equality between gender roles and social classes can be achieved through education. Bibliometric evidence on gender gaps in school education further confirms that structural inequalities in girls' access to primary and lower-secondary education

persist globally, with underrepresentation of research from the Global South, indicating early-stage human capital disparities that later translate into labor market inequality (Temirtayeva, Kovaleva, & Kudebayeva, 2025). Additionally, a higher level of education can lead to higher earnings as it qualifies workers for more lucrative positions. However, for example, according to Beaubrun & Kachouie (2017), cultural norms tend to favor men in the social order in the majority of countries. This statement is remarkably accurate for underdeveloped or developing countries. Navarro-Gómez and Rueda-Narváez (2014) also found that discrimination is not uniformly experienced by female workers, with more significant effects observed among those with higher education levels and better wages.

Beaubrun & Kachouie (2017) also found that education has a significant role in determining wage and has a favorable impact on it. For example, in the Bahamas, authors observed that wages rise by $409 from one educational level to the next on average, indicating that higher education levels are associated with higher salaries (Beaubrun & Kachouie, 2017). However, a study from Cameroon obtained the exact opposite results. Female wage workers have a clear education-based advantage over their male colleagues and enjoy a salary premium (Wirba et al., 2021).

Spanish researchers de la Rica et al. (2021) note that, on the one hand, they observe a more significant unexplained gap at the top of the distribution than at the bottom for the group with a college education. However, on the other hand, the disparity is even greater for the group with less education at the bottom of the distribution than at the top. Authors refer to this unusual trend as "glass floors" and argue that it stems from statistical discrimination on the part of employers, as fewer women are represented in this group in Spain (de la Rica et al., 2021). The authors agree that there is an educational mismatch which influences gender wages in Spain. They find that the portion of the gender wage gap that results from disparities in returns is more significant in this group, even though it is smaller for those with lower levels of education. Conversely, among highly educated workers, the gender gap is more noticeable. Nevertheless, in this instance, the majority of the salary differences are ascribed to variations in productive traits. In any event, the findings imply that workers who display an educational mismatch are more likely to experience gender wage discrimination (del Mar Salinas-Jiménez et al., 2013). In addition, Garcia-Prieto and Gómez-Costilla (2017) noted that discrimination at all educational levels was prevalent in the Spanish labor market. However, when low-educated workers are examined, this issue becomes quantitatively more significant, and highly educated women experience less gender discrimination (Garcia-Prieto and Gómez-Costilla, 2017).

According to Castagnetti et al. (2018), since women's unobservable traits drive female employment towards overeducation and lower women's salaries more than men's unobservable features do for men, estimates suggest that the gender pay gap is much more significant among workers with more education than among workers with a regular education. The authors conclude that individuals (both men and women) who compensate for their less productive attributes with more education are, first and foremost, best matched by overeducation. Second, it might serve as a signaling tool for women who have invested in a degree that is not useful for their work, allowing employers to recognise their valued but often invisible productive traits and combat salary discrimination based on gender. Since women are underrepresented in higher education compared to men, despite being more educated, there should be no reason to worry that increasing access to higher education will harm women (Castagnetti et al, 2018).

Del Mar Salinas- Jiménez et al. (2013) argue that even though there is less of a gender income difference for people who have low educational attainment, the portion of the gap caused by variations in returns is more significant in this group. Contrarily, the gender pay gap is wider among workers with advanced degrees, although in this case, the main reasons for compensation

gaps are variations in workers' productive traits. In any case, findings imply that wage discrimination against women is more prevalent among workers with educational mismatch (Del Mar Salinas- Jiménez et al., 2013).

Another researcher, Park (2018), tried to examine the gender pay gap among doctorate holders in Korea. He discovered that even among highly educated individuals with doctorates, there is a significant gender pay disparity.

Moreover, this discrimination against female PhD holders in the Korean labor market cannot be explained by disparities in gender characteristics (Park, 2018). Additionally, Waite (2016) examined the value of postgraduate education for men and women, finding significant income premiums for both groups, particularly among younger cohorts who held master's and doctoral degrees. However, women with master's degrees had a smaller gender wage gap than women with bachelor's and doctoral degrees (Waite, 2016). Evidence from transition economies further suggests that even high educational attainment does not guarantee equal labor market returns when household norms and institutional barriers constrain the utilization of human capital (Kovaleva et al., 2025a, 2025b).

Marital Status: The hidden factor behind gender pay inequality

According to a well-known economics theory, the reason for the gender wage difference is not discrimination against women by employers, but rather fathers and mothers invest differently in paid employment and the home. The authors of the current SLR observe that marital status is claimed to play a key role in gender pay disparity and the cause of the female wage penalty.

According to the conventional family division of labor, men are responsible for providing for the family's needs while women serve as caregivers. Empirical evidence from Kyrgyzstan supports this mechanism: women living in patrilocal households allocate significantly more time to unpaid domestic labor, which affects their labor market participation and long-term human capital accumulation (Kovaleva & Taylor, 2023b; Kovaleva et al., 2025a). For example, in Italy, cultural factors and low availability of formal childcare services define gender roles that are generally based on the male breadwinner model, in which childcare is almost entirely entrusted to women (Cutillo & Centra, 2017). Other researchers disagree with this statement. For example, according to Purwanto (2021), married females are more likely to serve as both the family's primary provider and caretaker than married males. According to that notion of two roles, working women earn the highest wages, and the marriage wage penalty is no longer in effect (Purwanto, 2021).

Xiu & Gunderson (2013) also studied this issue and found that women's incomes are significantly impacted by childcare duties for children under the age of six. However, if an older family member is present, they are nearly entirely offset, highlighting the fact that women bear a disproportionate amount of the childcare burden. Furthermore, in China, marriage significantly raises women's incomes but not men's, while these effects are almost entirely offset if an elder family member is present (Xiu & Gunderson, 2013).

One more interesting and unusual research was made by Waite (2016), who explored if sexual orientation is a factor in the stratification of labor markets. According to Waite (2016), lesbians, homosexual males, and straight women make the least money, followed by heterosexual men. To put it another way, all males perform better than all women, but lesbians and homosexual men are better off than their heterosexual counterparts (Waite, 2016).

The motherhood penalty: balancing career and family at a cost

Women's job market prospects typically decline when they become mothers. According to numerous research studies, mothers have less success in the labor market than women without children. The maternity wage penalty, which is arguably the most well-established and distinct from any gender wage penalty. At least a dozen affluent nations have documented the maternal wage penalty. Additionally, the punishment has not decreased over time.

For example, according to Benard et al. (2008), at least a dozen developed countries have reported this. Additionally, the punishment has not decreased over time (Benard et al., 2008). Misra & Strader (2013) also agree that mothers' wages are significantly lower than those of fathers in many nations, even though women's wages are catching up to those of childless males. Mothers are penalized compared to childless women, whereas fathers receive advantages compared to males (Misra & Strader, 2013).

Kizilova & Mosakova (2019) article examines the dynamics of birth rates in the BRICS nations about gender disparity in the workplace. The authors demonstrate how fertility is impacted by gender inequality in the workplace. The BRICS countries demonstrate that higher levels of women's employment, earnings, and gender equality in the economy are correlated with lower birthrates, as well as a higher proportion of women enrolling in higher education. On the one hand, greater gender parity in the job market makes it simpler for women to balance work and family obligations, leading to more children being born into each family. On the other hand, having several children is becoming less common. Therefore, in the long run, the gender equality policy results in a reduction in the number of children per family (Kizilova & Mosakova, 2019).

According to Benard et al. (2008), compared to other workers, women receive about 5% less money per child. Even after statistically adjusting for a variety of other occupational and human capital factors, including race, education, work experience, and whether a person works full-time or part-time, the penalty still exists. Combet & Oesch (2019) support previous findings and also claim that there is a 3–6% unexplained gender wage disparity favoring men in the United States. According to this research, even before they have children, young women make less money than young males who possess the same productive qualities. This means that young women only make half as much as young men do annually in terms of earnings (Combet & Oesch, 2019).

Looze (2015) states that although prior research has revealed that disparities between mothers and women without children in terms of human capital development, employment experience, job hours, and unobserved factors can contribute significantly to this penalty, they do not provide a complete explanation.

The penalty's component that is still unaccounted for is frequently blamed on a combination of mothers' reduced work effort and prejudice against women by employers (Looze, 2015). The researcher also discovered that becoming a mother lowers the probability of women making the kinds of deliberate, non-family work moves that often lead to higher incomes. Additionally, Looze (2015) found that various patterns of job switching and leaving the workforce account for approximately 20% of the wage penalty associated with motherhood and that these variations also contribute to explaining why women who have children at an early age are particularly affected by the wage penalty. Finally, after examining the various reasons why women find themselves unemployed, Looze (2015) found that interruptions caused by family obligations have more significant short-term wage penalties than those caused by a layoff; however, these consequences persist for a long time among highly educated women.

It is interesting that analyses of gender disparities in pay and work schedules on well-known online job boards also confirm the results of previous research. Adams-Prassl (2021), utilizing data from two million tasks from the Amazon Mechanical Turk online job platform, found that women earn 20% less per hour on average. Additionally, the author noted that women are more likely to

interrupt their working time on the platform, which has repercussions for their haste in completing tasks. Finally, Adams-Prassl (2021) found that workers with children are disproportionately affected by gender variations in working habits and hourly salaries.

Using Hong Kong 1996, 2001, and 2006 data, Yip & Wong (2014) study provides unequivocal evidence that age-specific reproduction rates have a detrimental impact on female income. More crucially, while males in identical situations are unaffected, the negative impacts of fertility on women's incomes are noticeably more substantial in occupations where women predominate. Our idea helps to explain why the gender gap widens with age because, in the early stages of women's professions, fertility rates tend to rise with age. While Waite (2016) study from Canada showed that the maternity penalty has decreased since the 1980s, particularly for female employees in well-paying positions. There are still significant benefits to marriage and fatherhood, but notable disparities exist by career.

Self-employment vs. wage employment: a gendered income divide

Many people believe that working for oneself is preferable to working as an employee for an organisation. According to Lawter et al. (2016) organisational issues, such as a declining workforce or limited job prospects, often prompt women to consider self-employment; however, they are also drawn to it by the numerous psychological and social benefits (e.g., flexibility, job satisfaction, work-life balance, independence).

Although more women are working for themselves, men and women continue to experience differing financial outcomes from this type of work. Similar structural segmentation patterns have been observed in Kazakhstan, where formal and informal self-employment exhibit widening unexplained wage differentials (Musayir et al., 2026). For example, Wirba et al. (2021) confirmed that male workers are paid more than female workers among self-employed. Also, Agussani (2020) support this idea and mention that in Indonesia, informal sector women continue to confront obstacles like prejudice, discrimination, and the wage gap. While Jung & Choi (2017) results suggest that in comparison to the self-employment sector, the wage sector has a more significant gender earnings difference. Additionally, the gender pay gap in the wage sector is primarily attributed to discrimination against women. On the other hand, the gender pay disparity in the field of self-employment is primarily attributable to productivity differences that are partially brought on by worker selectivity (Jung & Choi, 2017).

Another research from the US also confirms the statement above. Lawter et al. (2016) show that men and women who work for themselves earn significantly different salaries. Men made, on average, $54,959, while women made, on average, $28,554. Women make less money working for themselves than males do, regardless of whether they have the same level of education, work experience, hours worked, or vocation (Lawter et al., 2016). Even Nix et al. (2016) supported this notion by a study of the factors influencing the gender disparity in self-employment wages in four Sub-Saharan nations: Ghana, Rwanda, Tanzania, and the Republic of the Congo. Finally, Mbratana & Fotie Kenne (2018) results point to an unexplained component in self-employment and an explained component in paid employment as the causes of the wage gap, which has significant ramifications, especially at the bottom of the income distribution.

Public vs. private sector: where does the gender pay gap persist?

According to Aderemi & Alley (2019), work in private sector is a frequently overlooked factor of gender inequality. They found that the public sector has a narrower gender pay gap than the private sector due to superior education and a more substantial income stream resulting from longer employment. Additionally, the findings in Nigeria show that there is a sticky floor in the

private sector and a glass ceiling in the public sector (Aderemi & Alley, 2019). Moreover, the Mauritius study by Tandrayen-Ragoobur & Pydayya (2016) confirms these results. Over time, it was seen that the private sector has a larger unexplained wage disparity than the public sector, which is sometimes ascribed to discrimination (Tandrayen-Ragoobur & Pydayya, 2016). For example, in Bangladesh, employees in the public sector usually make 60% more than those in the private sector. Additionally, compared to the private sector, the gender wage gap is less pronounced in the public sector, and female employees in the public sector receive a significant portion of the salary premium (Anjum, 2016). Chakraborty (2020) and Taniguchi & Tuwo (2014) also support this statement.

Another study from Islamabad yielded quite interesting results. According to Ahmad & Naseer (2015), females experience discrimination not only from their immediate superiors but also from their coworkers. The study has also demonstrated that there is a gender bias in both public and private sector firms regarding promotions. Compared to male coworkers, women with the same qualifications and experience receive fewer promotions. Biased behavior is more prevalent in public institutions than in private ones (Ahmad & Naseer, 2015). Chakraborty (2020) also examined this issue and found that gender wage gap discrimination is often more substantial at the top than at the bottom, indicating that glass ceilings rather than sticky floors are more common for both men and women (Chakraborty, 2020). While Tandrayen-Ragoobur & Pydayya (2016) that the existence of sticky floors as evidence that the disparities in pay are greater at the bottom of the wage distribution than at the top.

A common observation is that there are fewer gender salary gaps in the public sector compared to the private sector. The reduction in gender discrimination in the public sector is partly to blame for this. Bradley et al. (2015) demonstrate that this conclusion is false, as the usual finding for the public sector is mainly influenced by the presence of sizable gendered occupational groups that have flat job hierarchies and low wage variance, such as nursing and teaching. Other public sector jobs have substantial compensation discrepancies that cannot be attributed to workplace or employee factors. This suggests that gender discrimination is pervasive in some jobs in the public sector (Bradley et al., 2015).

Anastasiade & Tillé's (2017) work results are also quite important. They evaluated the estimated explained and unexplained components of the difference in average earnings between the private and public sectors in Switzerland. The authors demonstrate that discrimination occurs relatively uniformly in the public sector, in both lower-paying positions and jobs with higher salaries. However, in the private sector, discrimination is more prevalent in lower-paying positions than in those with higher income (Anastasiade & Tillé', 2017).

Rural vs. urban labor markets: geography and the gender pay divide

The participation of women in rural areas is limited in most spheres, including cultural, social, economic, health, and nutritional aspects, among others. According to Duhan et al. (2021), due to social norms and gender-based discrimination, the bulk of their labor is ignored, undervalued, and unappreciated. For example, Duhan et al. (2021) state that there is a significant gender gap in educational attainment, with women (42.90%) achieving higher rates than men (24.40%) in rural areas.

Raising rural real wages is seen as the most important policy for guaranteeing women's economic prosperity because women are more likely to work in rural areas of Asia than in metropolitan ones (Anon, 2019). The author also states that women are most affected by the stagnating rural wages since they make up the lowest paid workforce segment, are preferred in labor-intensive but low-paying activities, and are subject to occupational segregation and lower

pay than men for the same work. The social system makes it more difficult for women, who are the least educated and have the fewest opportunities outside of agriculture, to relocate to urban areas in search of employment (Anon, 2019).

Another study conducted in 16 regions of Poland found that that the average earnings are more significant in more urbanised locations than in rural ones (Majchrowska & Strawinski, 2016). Authors argue that women make less money than men in every region, although the most urbanised regions have the highest gender wage gaps. While a significant portion of those gaps can be explained by disparities in worker characteristics, particularly by differences in sectoral employment structures (Majchrowska & Strawinski, 2016).

According to Yamamoto & Kaneko (2017), there is also a higher wage gap in regular employment for rural workers in Nigeria, though the gap decreases in casual employment. The findings of a later study show that, rural women face significant salary discrimination and less prospects to obtain regular employment, even though their educational attainment is on par with that of men or urban women. This may provide light on the alleged lack of incentives for females' education in rural Nepal (Yamamoto & Kaneko, 2017). Lastly, regression results from Indonesia's 2010 National Labor Force Survey (Sakernas) show that urbanization tends to benefit male workers more than female workers in terms of monthly salaries (Taniguchi & Tuwo, 2014).

Occupational segregation: the gendered distribution of work

According to Couppié et al. (2014), out of 54 strongly gendered professions in France, 26 have segregation that is primarily the result of school pre-sorting. Anjum (2016) argue that labor-intensive industries, such as agriculture, forestry, fisheries, production, and transportation, have the most significant gender pay disparity (56.4%). In contrast, management, technical, and professional professions exhibit the most minor disparity (22.1%). Moreover, Bartnik et al. (2022) study uses data from the U.S. Current Population Survey to analyse the male-female salary difference across occupational groups ranked by gender density. They find that the gender wage gap is consistently correlated with occupational feminisation, with male-dominated occupations having the lowest gender wage gap and the lowest average incomes for men and women. The highest male and female pay, the most significant gender pay disparity, and the least amount of wage discrimination are all found in occupations that are not gender-specific (Bartnik et al., 2022). In addition, Hedija (2017) observe that the number of women in the sector is the most significant factor explaining the variations in the gender pay gap among particular industries, according to statistics from the European Union Statistics on Income and Living Conditions (EU-SILC) for 24 EU member states.

Work hours, when men work much longer hours than women, is the factor that has the biggest impact on the wage differences in occupations (Fuchs, 2016). Another factor which could explain occupational segregation is math skills. According to Fuchs (2016), there is a significant advantage for men in math studies, and this has an impact on income differences as well. The inferior performance of women in math and science, which is evident as early as high school, is a result of fewer women taking advanced math and science exams, pursuing academic degrees, and pursuing professions in these subjects. Although there are many more women in academia than in other sectors, only 20 to 30% of students in technical fields are female nowadays. Males predominate in technology-related occupations, which eventually offer the highest-paying positions. There is a decline in employment even among women who have a degree in computer sciences, which may be related to the long hours that are typical in this field (Fuchs, 2016).

Nevertheless, authors of current systematic literature reviews (SLR) have observed that women have significantly improved their educational attainment over the past few decades, which has allowed them to enter some well-paying but traditionally male-dominated occupations, such as administration, law, and medicine. However, other professions, such as urban planning, architecture, engineering and remain strongly divided (Waite, 2016).

For example, according to research from Lebanon by Hejase et al. (2020), age, experience, family obligations, and physical prowess are all significant determinants of the wage differential in the agriculture sector. Nationality and educational attainment, on the other hand, had no effect on the salary disparity. The study also revealed a 40% salary discrepancy, which is a sizable pay difference, when the number of male and female employees and their average hourly wages were taken into account (Hejase et al., 2020). Schwaab et al. (2019) also tried to analyse whether there are salary differences between the sexes in the agricultural labor market in rural Brazil. The primary findings indicate that men earn 157.62% more per hour than women do, with discrimination accounting for 108.38% of this difference (Schwaab et al., 2019)

Moreover, extreme gender inequality still exists in the construction sector. According to Adenugba & Oderinde (2017), in Nigeria, women are breaking into the construction industry. However, despite being a significant occupational group in this area, Nigerians experience some exploitation and prejudice. The authors conclude that because of society's patriarchal structure, women are cast in inferior roles at work. Moreover, according to Kumar (2013) over 35% of workers in India's construction sector are women, although they receive inadequate pay and face wage discrimination. Women do not have the same opportunity as males to become supervisors or progress in their careers (Kumar, 2013).

In addition, Fleming (2015) study of 112,990 workers in the US hospitality industry in 2010 found strong evidence that a sizable wage gap still exists between men and women in the sector, even after accounting for potential explanations. Being a woman was associated with a $620 income loss relative to the mean annual income of $11,271 across the overall hospitality sector. Being a woman costs the food service industry $542, equivalent to a mean income of $9,339, and the lodging sector $2,368, corresponding to a mean income of $17,783. The worst consequences, however, were for managers, where being a woman cost $6,617 compared to a mean income of $30,577 (21.6%) (Fleming, 2015). Ferreira Freire Guimarães & Silva (2016) came to the same conclusion and found out that Brazil's tourism industry also exhibits gender wage inequality. Also, according to Casado-Díaz et al. (2022) there is a sizable gender pay discrepancy in Spain's hotel industry. The authors contend that, in line with the glass ceiling phenomena, more qualified women in the industry face double punishment due to severe segregation into jobs that pay less and unfair wage treatment in comparison to their male counterparts (Casado-Díaz et al., 2022). Marfil Cotilla & Campos-Soria (2021) also studied the Spanish hospitality sector. They found that the primary sources of the discriminatory component are variations in human capital returns and vertical segregation. To conclude, according to Campos-Soria et al. (2015) external mobility in the hospitality industry is not only significantly higher than internal mobility, but it is also a leading cause of wage inequality.

Risk aversion and wage gaps: how attitudes shape earnings?

Jung et al. (2018) argue that the observed gender salary discrepancies could also be attributed to gender differences in risk choices. This idea is supported by other research all around the world. For example, according to Maitra et al. (2021), women have a lower likelihood to negotiate and tend to be more risk-averse than men. Together, the two factors reduce the gender wage difference by 29% and explain 15.5% of the wage gap's unexplained component. Also, in the experiment by

Jung et al. (2018), between 40% and 77% of the gender salary discrepancy in the studies was explained by the stable career options that women were more likely than males to choose. At the same time, Jung (2017) explored a novel approach to applying individual risk attitudes to representative Korean data and predicting the gender wage gap. The author states that the selection bias caused by risk attitudes leads to the salary disparity being overestimated. Because they are more risk averse, women often choose not to participate in the labor market altogether or, if they do, tend to work in the public sector, where salaries are typically less than in the private sector. Jung (2017) demonstrates that the gender pay gap can be partially explained by self-selection based on risk attitudes.

Starting wages: gender pay gaps from day one

Pay disparities between men and women have drawn the attention of labor economists since the early 1970s. However, there is currently little actual data regarding differences in starting salaries between the number of men and women entering the workforce. To fill this gap, Bredtmann and Otten (2014) used a unique dataset on graduates from German universities. The findings demonstrate that entry-level salaries for women are substantially less than those for men. They also discovered that gender variations in visible features do not account for a sizable fraction of this discrepancy (Bredtmann and Otten, 2014). Another researcher, Triventi (2013), also attempted to examine whether a gender gap exists among graduates across 11 European nations. According to decomposition analysis, the Czech Republic has a higher level of prejudice than the Nordic countries, with the United Kingdom and continental and southern European nations falling in between. The most significant variables influencing the gender difference among recent graduates are employment characteristics and working hours (Triventi, 2013).

Competition in the workplace: a gendered approach to earnings

As Heinz et al. (2016) state, compared to males who do the same work, women who opt to work under the non-competitive piece-rate remuneration model are paid significantly less. In their experiments, it always appears that women are not as rewarded for competing in the event. Instead, it seems as if women are penalised for selecting the non-competitive piece rate Heinz et al. (2016). Additionally, according to taste-based discrimination theories, market pressures are expected to eliminate discriminatory behavior. For example, Heyman et al. (2013) discovered that an ownership change results in an increase in the proportion of female employees, especially when there is no rivalry in the product market. Furthermore, the gender wage gap is decreased through increased competition (Heyman et al., 2013). Hirsch et al. (2021) findings a also in line with taste-based discrimination; they argue that competitive forces limit gender wage discrimination. Cukrowska-Torzewska & Magda (2020) findings also support competition theory. Finally, according to Majchrowska & Strawinski (2016) in regions, where employer competition is higher, the unexplained part of the gender wage gap – which is frequently ascribed to wage discrimination – tends to be less.

Conclusion

The present study conducts a systematic literature review of gender wage gap determinants from a human capital inequality perspective. Based on the analysis and synthesis of 63 refereed journal articles, it identifies 10 determinants grouped into three clusters: human capital endowments, structural labour market factors and institutional and cultural factors.

The wage discrimination experienced by women cannot be explained solely on the basis of the characteristics recorded in the ECHP that are generally considered to be relevant to wage

setting such as education, innate ability and past working experience. The wage discrimination is therefore the result of discrimination in the process of forming, using, distributing and rewarding human capital throughout working life. This is the case for the labour market variables that have an impact on household resource allocation, gender stereotypes, discrimination by sex and sector, labour market segmentation, monopsony, competition, informality and discrimination.

Wage inequality in the labour market has been a topic of concern for many researchers in the last few decades. While improving education and increasing investment in human capital is seen as a key policy to reduce wage inequality, wage returns to education and experience are determined in the labour market institutions and labour market conditions. Motherhood penalty, sectoral differences, and occupational gender sorting are examples of how the life cycle events interact with labour market institutions and give rise to persistent gender wage differentials.

The purpose of this paper is to unify and relate a vast amount of scattered literature in labor economics. In three respects, the paper makes important contributions to labor economics. First, the paper relates the micro-behavior of endogenous human capital accumulation to the labor market institutions in which these decisions occur. Second, the paper presents the gender wage gap as an example of human capital disparities rather than a discriminatory issue. Third, it provides a framework for future empirical and policy work aimed at reducing labor market discrimination.

In the opinion of the reviewer, the gender wage gap is a highly complex problem that cannot be solved solely through equal pay policy. In order to tackle the gender wage gap, the author believes that interventions are needed at two stages of the production and pricing of human capital: 1. To prevent discriminatory hiring practises that cause gender-based occupational segregation. 2. To improve childcare and parental leave policies, as well as to increase labour market competition through anti-monopsony measures, to enable women to gain higher-level jobs and to prevent women from being excluded from the informal labour market.

Answers to the research questions raised above will have to be researched empirically by using longitudinal and panel data. A large number of the hypotheses raised in the background of the study are still untested. This calls in particular for a high quality panel data set of countries that differ in their institutions from the standard of developed OECD-countries. Developing and transition countries are appropriate candidates. In order to be able to develop the right policy for reducing human capital inequality dynamically over time for different subgroups of the population, one first needs to get a better understanding of the dynamics over time.

In short, the gender wage gap is not a wage-setting anomaly but a systemic consequence of unequal human capital formation, allocation and prices in labour markets.

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Internal Migration in Kazakhstan and the Pressure on Urban Infrastructure: A Case Study of Almaty

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ABSTRACT

This study examines the structural relationship between internal migration and urban infrastructure capacity in Kazakhstan, focusing on Almaty as the primary metropolitan destination. Following the collapse of Soviet centralized spatial planning, the rapid transition to a market economy generated profound regional socio-economic disparities, driving a substantial demographic shift from rural regions to major metropolitan areas. Utilizing a comprehensive administrative and statistical data triangulation framework spanning 2010 to 2024, this paper evaluates the multi-sectoral impacts of this demographic concentration on housing, transport networks, municipal utilities, and environmental systems. The spatial analysis reveals that the rapid horizontal expansion of Almaty's peri-urban fringe has led to the rise of under-serviced informal settlements, severe transport congestion, utility capacity overloads, and acute winter air pollution that far exceeds World Health Organization guidelines. By integrating Neoclassical, Harris-Todaro, and Push-Pull migration frameworks, this study analyzes why these demographic flows persist despite escalating urban costs and physical infrastructure constraints. The findings demonstrate that migration-driven urban expansion operates as a structural spatial process rather than a short-term demographic fluctuation, requiring a transition from reactive municipal planning to integrated, multi-scalar urban-regional governance. The study concludes with strategic policy recommendations targeting affordable housing, transit-oriented development, environmental modernization, and regional economic diversification.

KEYWORDS: Internal migration, urbanization, post-socialist transition, infrastructure pressure, Almaty, housing affordability, air quality.

1 Introduction

1.1 Background of the Study

The phenomenon of internal migration represents one of the most critical drivers of demographic and socio-economic transformation within rapidly developing and transition economies. While international migration frequently dominates global scientific and policy discourse, the movement of populations within national borders exerts the most immediate and profound impact on domestic labor markets, spatial inequality, regional development, and urban infrastructure. Internal mobility serves as both a catalyst for and a reflection of rapid urbanization, structural economic shifts, and uneven territorial development. In the post-Soviet space, these dynamics are deeply intertwined with the transition from state-controlled command structures to market-oriented spatial economies.

Kazakhstan presents a highly significant case study for evaluating the spatial consequences of post-socialist structural transformations. Following the acquisition of independence in 1991, the nation underwent a rapid transition from the highly centralized planning mechanism of the Soviet Union to a market economy. Under the Soviet regime, the spatial distribution of the population, industrial specialization, agricultural cultivation, and urban growth were strictly regulated by state organs via centralized investments and administrative tools such as the residential registration system (*propiska*). The sudden dismantlement of this command system exposed severe regional vulnerabilities. Industrial mono-cities faced massive state subsidy cuts and factory closures, while rural agricultural zones experienced severe economic downturns. Conversely, major metropolitan centers rapidly diversified into service-oriented, financial, and administrative hubs, concentrating capital, foreign direct investment, and high-value employment opportunities.

This structural divergence has generated a sustained, positive net migration balance in Kazakhstan's largest metropolitan areas, most notably Almaty, Astana, and Shymkent. Almaty occupies a unique position within this national urban hierarchy. Despite the transfer of capital status to Astana in 1997, Almaty has retained its preeminence as the financial, cultural, and educational heart of the country, generating approximately 20% of Kazakhstan's Gross Domestic Product (GDP) while housing roughly 12% of its population. Consequently, the city attracts a massive, continuous influx of rural and provincial migrants seeking upward socio-economic mobility, higher wages, and superior public services.

1.2 Problem Statement

The central problem investigated in this study is the insufficient integration of migration dynamics into urban infrastructure planning and regional development policy in Kazakhstan. Because the growth of transition-economy metropolises frequently runs ahead of municipal capital investment, Almaty's urban systems are under severe pressure. The continuous influx of internal migrants has driven up real estate prices, catalyzed the rapid, unregulated expansion of peri-urban informal settlements, congested transport networks, overloaded utility grids, and exacerbated environmental degradation.

National strategies frequently treat population mobility merely as an economic indicator or an exogenous demographic variable, rather than an active, structural force that shapes and strains the physical urban system. There is a critical disconnect between the macroeconomic drivers of migration and the localized capacity of the host city to absorb these population shocks. Consequently, Almaty's infrastructure systems—many of which are path-dependent structures designed during the Soviet era—are operating at or beyond their engineered thresholds. This creates a spatial mismatch between urban expansion, transport connectivity, environmental sustainability, and social equity.

1.3 Research Objectives and Questions

To address this central problem, this research seeks to answer the following main question: *How does internal migration affect urban infrastructure capacity in Almaty, and to what extent are current urban planning and governance mechanisms capable of managing this pressure sustainably?* To systematically unpack this inquiry, several sub-questions are addressed:

- What are the primary macro-demographic patterns and structural economic drivers of internal migration in post-independence Kazakhstan?

●How has internal migration contributed to the demographic concentration and socio-demographic stratification of Almaty's population?

●Which specific sectors of Almaty's urban infrastructure are most acutely affected by this demographic influx, and what are the downstream environmental and spatial consequences?

Correspondingly, the research pursues several key objectives:

●Deconstructing the structural drivers and macro-demographic patterns of internal migration in post-independence Kazakhstan.

●Quantitative and qualitative evaluation of the demographic profile, age structure, and labor market integration of internal migrants in Almaty.

●Multi-sectoral assessment of migration-induced pressure on Almaty's housing markets, transport systems, municipal utilities, and environmental infrastructure.

●Formulating strategic, evidence-based policy recommendations designed to harmonize migration management, regional development, and sustainable urban governance.

1.4 Significance of the Study

The theoretical significance of this research lies in its integration of migration theory with urban planning and physical systems analysis. Classic migration models, such as neoclassical theory or the Harris-Todaro framework, treat the destination city as an elastic labor sink with infinite capacity. Conversely, urban planning literature often views infrastructure deficits as isolated engineering or administrative failures, ignoring the structural, macro-economic forces that drive population concentration. By analyzing population mobility and physical system thresholds together, this paper provides a unified spatial framework for understanding urban-regional dynamics in post-socialist transition economies.

Empirically, this study provides a detailed sectoral assessment of migration-driven urban strain in Almaty, linking demographic indicators directly to housing transactions, commuting times, water-energy consumption rates, and air pollution indices. At the policy level, this analysis offers direct value for national and municipal planners. By identifying the specific physical bottlenecks and spatial patterns associated with inward migration, the study provides a baseline for more targeted, forward-looking infrastructure investments and balanced regional development strategies.

1.5 Temporal and Spatial Boundaries

The temporal boundary of this study covers the years 2010 to 2024. This timeframe captures the post-crisis consolidation of Kazakhstan's economy, the rapid acceleration of urbanization, and the post-pandemic mobility shocks that occurred between 2021 and 2024. The spatial boundary is centered on the Almaty urban agglomeration. This geographical focus encompasses both the dense municipal core of Almaty and its rapidly expanding peri-urban residential fringe, including newly integrated administrative districts such as Alatau and Nauryzbai, which serve as primary arrival zones for internal migrants.

2 Literature Review and Theoretical Framework

2.1 Conceptualizing Internal Migration

Internal migration represents a highly complex form of population mobility that reshapes demographic structures, redistributes human capital, and reconfigures economic geography within national borders. Unlike international migration, which is heavily constrained by state borders,

legal jurisdictions, and citizenship regimes, internal migration operates with relative freedom, acting as a highly sensitive barometer of regional economic inequality and structural spatial imbalances.

Demographic and spatial typologies categorize internal population movements into several distinct spatial pathways :

- Interregional migration, which involves long-distance relocations across provincial administrative borders ;
- Intraregional migration, which encompasses localized movements within the boundaries of a single administrative region ;
- Rural-to-urban migration, which serves as the primary engine of demographic urbanization ;
- Urban-to-urban and peri-urban migration, which reflects suburbanization and the growth of metropolitan agglomerations.

2.2 Theoretical Approaches to Population Mobility

To understand why large-scale population movements persist despite rising urban congestion and living costs, this study integrates three complementary theoretical frameworks.

2.2.1 Neoclassical Migration Theory

Neoclassical migration theory conceptualizes migration as a utility-maximizing economic decision made by rational individuals. At the micro-level, individuals calculate the expected costs and returns of relocating, migrating only if the net present value of lifetime earnings in the destination region exceeds that of the origin region. At the macro-level, migration is driven by spatial imbalances in labor supply and demand, which manifest as regional wage differentials. Under this framework, labor flows from capital-scarce, labor-abundant regions (low-wage zones) to capital-abundant, labor-scarce regions (high-wage zones).

In Kazakhstan, this economic disparity is highly pronounced. While Almaty has historically concentrated high-value services, banking, and commerce, sending regions in southern and western Kazakhstan remain structurally dependent on low-productivity agriculture or volatile extractive industries. Quantitative assessments indicate that regional wage differentials of 40% to 60% explain a substantial portion of internal migration flows in transition economies. However, neoclassical models assume near-perfect information and friction-free labor absorption, failing to account for the structural barriers, rising costs, and infrastructural bottlenecks that migrants encounter in the host city.

2.2.2 The Harris-Todaro Model and Expected Income

The Harris-Todaro model addresses the limitations of neoclassical theory by introducing expected income differentials and urban unemployment into the migration equation. The core premise is that migration from rural or lagging regions to urban centers continues even in the presence of high urban unemployment or informal labor markets. This decision is rational because migrants are motivated by expected urban income, which is determined by the actual urban wage multiplied by the probability of securing formal employment.

If the expected urban income is higher than the rural wage, migration will persist, even if it leads to a pool of underemployed or informally employed migrants in the city. In Almaty, this

expected-income dynamic is highly visible. While high competition and a lack of affordable housing present significant entry barriers, migrants continue to arrive, often absorbing informal, temporary, or low-paid jobs in the construction, retail, and service sectors. They accept these short-term compromises because they prioritize long-term upward mobility and the future integration of their families into the urban system.

2.2.3 Push-Pull Theory

Lee's Push-Pull theory provides a comprehensive spatial framework by categorizing the forces that drive migration into push factors (unfavorable conditions at the origin), pull factors (attractive features at the destination), and intervening obstacles (such as physical distance, moving costs, and administrative barriers).

In the Kazakhstani context, push and pull factors operate across economic, social, and institutional dimensions. This multi-dimensional dynamic is structured in Table 1.

Dimension	**Push Factors (Sending Regions)**	**Pull Factors (Almaty / Destination Hubs)**
Economic	Limited industrial diversification, low agricultural productivity, seasonal unemployment, and lower wages.	High concentration of capital, diversified service and trade labor markets, and higher wages.
Social / Institutional	Declining quality of regional schools, restricted healthcare access, and weak social infrastructure.	Concentration of prestigious universities, advanced medical centers, and rich cultural opportunities.
Environmental	Water scarcity, land degradation, and climatic vulnerability in agricultural zones.	Highly developed physical urban systems and centralized municipal utilities.

Table 1: Structural Push-Pull Factors of Internal Migration in Kazakhstan

This push-pull dynamic highlights that migration is driven not only by wage differentials but also by structural inequalities in access to institutional capital and public goods. Almaty serves as an institutional magnet, concentrating over 35% of Kazakhstan's higher education institutions and

a significant share of its specialized healthcare services. Studies show that access to quality education is the primary migration driver for over 50% of young internal movers in the country.

2.3 Internal Migration Research in Kazakhstan

Local and regional scholarship has increasingly recognized internal migration as a core indicator of spatial and economic inequality in Kazakhstan. Scholars such as Appakova, Nesipbekov, and Zhanbozova have classified Kazakhstani regions into migration-attracting, migration-retaining, and migration-repelling zones. Their findings consistently place Almaty and Astana in the first category, while rural, southern, and mono-industrial regions fall into the third.

Similarly, Bokayev and Akhmetova highlight that migration operates as a labor-redistribution mechanism, shifting human capital from low-productivity rural zones to highly diversified metropolitan economies. This structural shift is supported by regional macroeconomic data. Quantitative analysis covering the period from 2013 to 2023 reveals a strong positive correlation (+0.411) between urban inward migration and Gross Regional Product (GRP) growth, contrasted with a strong negative correlation (-0.411) between rural outmigration and regional economic performance.

This regional imbalance is further illustrated by the migration attractiveness index developed by Khishauyeva, which shows that only a very small number of administrative territories maintain a positive net migration rate, leading to an extreme demographic concentration in Almaty, Astana, and Shymkent.

2.4 Conceptual Gaps and Analytical Framework

Despite this expanding body of research, a critical analytical gap remains. Most local scholarship treats internal migration as a static consequence of regional inequality, or as an administrative challenge for labor market regulation. There is a lack of research examining migration as a dynamic, physical process that reshapes urban morphology and strains localized infrastructure. Conversely, urban planning literature in Kazakhstan often treats infrastructure shortages as purely engineering or administrative failures, ignoring the structural, macro-economic forces that drive population concentration.

This study bridges this conceptual gap by treating population mobility and physical system thresholds as an integrated feedback loop. By combining gravity model with the expected-income and push-pull frameworks, this study demonstrates that Almaty's infrastructure pressure is not an accidental planning failure, but a predictable consequence of spatial polarization in a transition economy.

3 Empirical Strategy and Analytical Design

3.1 Research Design and Secondary Data Approach

This study utilizes a secondary data analysis design to evaluate the structural relationship between internal migration and urban infrastructure stress in Almaty. Given the scale and long-term nature of population redistribution and physical infrastructure development, primary field methods are insufficient to capture these macro-level dynamics. By systematically analyzing and triangulating longitudinal statistical datasets, institutional reports, and academic research, this study links population mobility to urban physical capacity.

The empirical logic is explanatory, moving from macro-demographic trends to localized, sector-specific impacts. The analysis traces how macroeconomic regional disparities generate specific migration streams, how these streams alter the demographic and spatial structure of

Almaty, and how this concentration translates into physical demand shocks across housing, transport, utility, and environmental systems.

3.2 Data Typology and Institutional Sources

The empirical foundation of this study rests on several validated data sources:

- **The Bureau of National Statistics of Kazakhstan:** Provides administrative data on interregional and intraregional migration flows, regional wage rates, GRP, housing construction volumes, real estate transactions, and transport usage.
- **International Development Institutions:** Reports from the World Bank, the United Nations Development Programme (UNDP), the Asian Development Bank (ADB), and the Organization for Economic Co-operation and Development (OECD) provide macro-level analysis of urbanization, regional inequality, and municipal governance.
- **Environmental and Public Health Organizations:** Datasets from the World Health Organization (WHO), the National Hydrometeorological Service (Kazhydromet), and independent monitoring groups (such as the Almaty Air Initiative) provide metrics on air quality, emissions, and seasonal environmental stress.
- **Local Peer-Reviewed Literature:** Academic publications from Kazakhstani universities provide critical contextual insights into the socio-demographic characteristics and labor market experiences of internal migrants.

3.3 Selection Criteria and Data Triangulation

Data selection was guided by three criteria: relevance to the spatial dynamics of internal migration, direct applicability to urban infrastructure sectors, and the availability of consistent longitudinal data. The temporal scope covers the years 2010 to 2024, a period of accelerated urbanization and shifting mobility patterns. The spatial scope is centered on the Almaty urban agglomeration, including both the municipal core and its rapidly expanding peri-urban fringe.

To ensure validity and minimize bias, this study utilizes a triangulation strategy, cross-referencing official administrative datasets from the Bureau of National Statistics with independent reports from international development organizations and local academic studies. This approach is particularly important in transition economies, where official registration records may underestimate informal or seasonal population movements.

3.4 Limitations of Secondary Administrative Datasets

This research strategy recognizes several empirical limitations. First, official migration statistics rely on administrative residency registration (*propiska*), which often underestimates informal, seasonal, or temporary migration flows. Second, a temporal lag exists between data collection, processing, and public dissemination by state bodies, which limits real-time assessment of post-pandemic mobility shocks. Finally, isolating migration-induced infrastructure pressure from organic urban population growth, industrial expansion, and rising consumer demand is methodologically complex. To mitigate these limitations, this study utilizes data triangulation and structural comparison, validating administrative datasets against independent development reports and academic surveys.

3.5 Ethical Protocols and Research Integrity

Ethical considerations are maintained throughout the research process. The study relies entirely on aggregated, publicly available, and anonymized institutional data, ensuring that no

individual personal or confidential information is used. Strict academic integrity is upheld through precise attribution and citation of all primary researchers and statistical providers.

4 Spatial Analysis of Internal Migration Patterns in Kazakhstan

4.1 National Macro-Demographic Dynamics

The scale of internal population mobility in Kazakhstan has increased dramatically over the past decade, transforming the demographic and economic landscape of the country. National administrative records indicate that in 2023, approximately 397,000 people relocated across regional borders. By 2024, this figure rose to nearly 688,000 internal movers, representing an annual increase of over 73%, as shown in Table 2.

Year	Total National Internal Migrants (People)	Almaty Net Migration (People)	Astana Net Migration (People)	Shymkent Net Migration (People)
2023	397,000	+44,800	+52,000	+22,000
2024	688,000	+36,061	+64,000	+31,000

Table 2: National Internal Migration and City Net Migration (2023–2024)

This surge reflects both post-pandemic demographic adjustments and a deep, structural consolidation of urbanward migration. While Astana registered over 64,000 incoming migrants in 2024, Almaty accepted approximately 60,000, and Shymkent attracted around 31,000. This concentrated demographic influx is reflected in Almaty's net migration trajectory, which has remained consistently positive, averaging over 30,000 net arrivals annually since 2014. This trend demonstrates that net inward migration is a sustained, structurally determined process rather than a short-term demographic fluctuation.

The geographic origins of these migration flows highlight severe regional imbalances. The primary sending regions are southern and eastern Kazakhstan, specifically the Turkistan, Zhambyl, Kyzylorda, and Almaty regions. These territories are characterized by high rural population densities, reliance on low-yield agriculture, and limited industrial diversification. Wages in these southern regions are 35% to 40% lower than those in Almaty, confirming neoclassical and push-pull theories that point to income inequality as a primary driver of migration.

4.2 Socio-Demographic Profile of the Migrant Population

Internal migration to Almaty is highly selective, concentrating younger, economically active, and mobile cohorts. The age distribution of internal migrants arriving in Almaty is structured in Table 3.

Age Cohort (Years)	Share of Inward Migrants (%)	Primary Socio-Economic Activity
18–24	38%	Higher education, vocational training, entry-level labor.
25–34	29%	Early-to-mid career labor, family formation, construction, services.
35–44	18%	Mid-career labor, small business ownership, trade.
45 and older	15%	Late-career labor, familial reunification.

Table 3: Age Demographics and Socio-Economic Activities of Almaty Migrants

The data shows that 67% of incoming migrants are between the ages of 18 and 34, and approximately 72% are under 35, highlighting that Almaty attracts a young, working-age population. In terms of gender distribution, the inward migration flow is relatively balanced, with females comprising 51% and males 49%. However, gender differences are highly pronounced in labor market specialization, with male migrants heavily concentrated in construction and transport, while female migrants are clustered in services, hospitality, and education.

4.3 Educational and Vocational Stratification

The educational profile of internal migrants to Almaty, detailed in Table 4, reflects a bifurcated flow.

Educational Level	Share of Migrants (%)	Downstream Labor Market Integration
Higher Education	34%	Professional services, banking, administration, corporate.

Specialized Vocational	42%	Skilled trades, transport, manufacturing, construction.
General Secondary	24%	Informal services, retail trade, day labor.

Table 4: Educational Attainment and Labor Market Outcomes

This distribution reveals two distinct migrant streams: a high-skilled and student cohort attracted by Almaty's universities and white-collar sectors, and a low- to medium-skilled labor cohort seeking immediate, often manual, employment. Student migration is a powerful demographic force; Almaty houses over 35% of the country's higher education institutions, and approximately 21% of young migrants move to the city specifically to pursue education, with a substantial portion remaining post-graduation.

4.4 Economic Drivers and Interregional Disparities

Securing employment is the primary motivation for over 58% of internal migrants in Almaty. Data from the Asian Development Bank indicates that internal migrants make up approximately 40% of all new entrants to the city's labor market. The distribution of employed internal migrants across key urban sectors is presented in Table 5.

Economic Sector	**Employment Share (%)**	**Nature of Employment (Formal vs. Informal)**
Construction & Infrastructure	35%	Predominantly informal, temporary, contract-based.
Wholesale & Retail Trade	25%	Mixed formal and informal, market stall operations.
Low-Paid Services	20%	Highly informal, hourly, cash-in-hand.
Corporate & Public Administration	20%	Highly formal, contracted, salary-based.

Table 5: Sectoral Employment and Labor Formality of Almaty Migrants

The data shows that 80% of employed internal migrants work in construction, trade, and low-paid or informal services. These sectors are characterized by low entry barriers, high labor turnover, wage volatility, and a lack of formal labor contracts. This concentration supports the Harris-Todaro model: migrants willingly accept the precarity and lower wages of the informal sector because the expected long-term benefits of residing in Almaty outweigh the limited economic prospects of their home regions.

5 Structural Pressure on Almaty's Urban Infrastructure

5.1 Housing Infrastructure and Peri-Urban Expansion

Almaty holds the largest residential real estate stock in Kazakhstan, containing approximately 171,000 residential buildings. However, the continuous influx of internal migrants has created a structural demand shock that outpaces supply, driving up prices and limiting housing affordability. Almaty has consolidated its position as the country's most active and expensive real estate market, registering a leading volume of housing transactions, including 8,432 registered transactions in December 2025 alone, and over 66,000 transactions in the second quarter of 2023.

This demand has driven real estate prices to unprecedented heights. By 2025, the average price of new housing in Almaty reached approximately 687,000 KZT per square meter, significantly exceeding national averages. This upward pressure is also highly visible in the secondary housing and rental markets, where apartment prices and average rental rates have surged by over 25% year-on-year.

Because formal housing markets are largely unaffordable for low-income migrants, this demographic pressure has driven rapid horizontal peri-urban sprawl. Over the past decade, Almaty's peripheral administrative districts, particularly Alatau and Nauryzbai, have seen rapid, unregulated population growth. These areas were originally rural outskirts but have been absorbed into the expanding metropolis to accommodate thousands of internal migrants.

Many migrants acquire small, affordable land plots in these peri-urban zones to construct informal or semi-official houses. These residential areas often bypass formal municipal planning, creating dense, low-rise neighborhoods that lack basic urban infrastructure. The horizontal expansion of these uncoordinated suburban settlements outpaces the city's capacity to extend municipal services, leaving many peri-urban residents without paved roads, centralized sewage, or reliable water connections.

5.2 Transport Infrastructure and Commuter Mobility

The rapid sprawl of Almaty’s peri-urban residential belt has created a severe spatial mismatch: while affordable housing is concentrated on the city's periphery, primary employment and commercial zones remain clustered in the central business districts. This spatial division generates massive daily commuter flows from the peripheral "dormitory" districts to the urban core.

Almaty’s road network and transit systems are under severe strain from this commuting volume. The city has a high density of private vehicles, which is compounded by thousands of daily transit commuters from the surrounding Almaty region. This has led to chronic, systemic traffic congestion. Commuters from peri-urban settlements frequently face travel times of over one

hour each way during peak periods, while average vehicle speeds in the city center during rush hour drop below 20 kilometers per hour.

To manage these mobility demands, municipal authorities have expanded Almaty's public transit network. The city utilizes a multimodal system composed of buses, trolleybuses, and a rapid transit metro line. Buses carry the vast majority of daily riders. While municipal services have invested in modernizing the bus fleet and introducing eco-friendly compressed natural gas (CNG) models, transit capacity lags behind demographic growth.

The Almaty Metro, which opened in 2011, serves as a critical transport corridor connecting eastern and western districts. While passenger volume has grown with the opening of new stations, the metro's physical reach remains limited. It does not yet connect to the rapidly growing northern and western peri-urban fringes where internal migrants are concentrated, leaving these vulnerable populations dependent on congested road networks.

5.3 Municipal Utilities and Centralized Grid Constraints

Almaty's centralized municipal utility systems, originally designed during the Soviet era for a smaller population and a more compact urban footprint, are facing critical capacity constraints. The centralized water supply relies heavily on glacial run-off from the Zailiysky Alatau mountain range. While Almaty has historically enjoyed abundant water resources, rapid population growth has driven water consumption to critical levels.

Extending centralized water supply and wastewater treatment networks to newly developed peripheral districts presents a major technical and financial challenge. Many informal peri-urban settlements experience chronic water shortages, low pressure, and incomplete sewage connections, forcing residents to rely on unhygienic septic tanks or local wells, which poses long-term risks for groundwater contamination.

Almaty's energy and heating infrastructure is under similar pressure. The city relies on centralized district heating networks powered by heavy, coal-fired Thermal Power Plants (specifically Combined Heat and Power Plants, or CHPs) located within the municipal boundaries. The demographic expansion has led to a major increase in electricity and heating demands, forcing these aging power plants to operate at near-maximum capacity, especially during the sub-zero winter months.

5.4 Environmental Stress and Air Quality Degradation

The combination of rapid population growth, heavy traffic, and reliance on coal-fired heating has led to severe environmental degradation, most visibly in Almaty's critical air pollution. The city's geographic location in a mountainous basin restricts natural air circulation, trapping emissions near the surface and creating a persistent smog layer.

Air quality measurements show that Almaty's concentrations of fine particulate matter, coarse particulate matter, and Nitrogen Dioxide regularly exceed both national limits and World Health Organization (WHO) guidelines. A comparison of average pollution levels against WHO standards is detailed in Table 6.

Pollutant	WHO Recommended Annual Guideline (µg/m3)	Average Level in Almaty (µg/m3)	Relative Exceedance (Factor)
Fine Particulate Matter	5	20–24	4.0x to 4.8x
Coarse Particulate Matter	15	30–35	2.0x to 2.3x
Nitrogen Dioxide	10	55–60	5.5x to 6.0x

Table 6: WHO Air Quality Guidelines vs. Average Annual Pollution Levels in Almaty

This air pollution exhibits sharp seasonal variation, driven by winter heating demands. The seasonal variation of fine particulate matter is detailed in Table 7.

Season	Average PM2.5 Concentration (µg/m3)	Relative Level Compared to WHO Guideline
Winter	49.9	Approximately 10 times higher
Spring	23.1	Approximately 4 to 5 times higher
Summer	9.7	Approximately 2 times higher
Autumn	18.5	Approximately 3 to 4 times higher

Table 7: Seasonal Variation of Concentration in Almaty

During the winter, when district heating and domestic coal-fired stoves are fully active, average concentrations reach nearly ten times the WHO guidelines, posing severe public health risks.

The primary sources of air pollution in Almaty are detailed in Table 8.

Source of Pollution	Estimated Contribution (%)	Primary Geographic / Operational Area
Coal-based domestic heating systems	35% – 40%	Peri-urban informal settlements.

Road transport emissions	30% – 35%	Major arterial transit routes, central business districts.
Thermal power plants (CHPs)	15% – 20%	Centralized industrial municipal zones.
Industrial emissions	5% – 10%	Manufacturing districts.

Table 8: Source Apportionment of Air Pollution in Almaty

This data highlights a dual structural problem: while heavy coal-fired power plants and transport emissions account for over half of all air pollution, domestic coal-fired heating systems in peri-urban areas contribute up to 40%. Because these suburban settlements are not connected to centralized gas grids, residents burn low-grade coal and wood for heating, exacerbating the winter smog.

To address this crisis, the municipal administration has launched environmental initiatives, including the "Transition to a Green Economy" and the "Almaty Environmental Action Plan". These plans prioritize upgrading thermal power plants to natural gas, expanding suburban gasification, and modernizing public transit. However, the continuous horizontal expansion of the city driven by internal migration presents a persistent challenge to these environmental goals.

6 Conclusions and Policy Recommendations

6.1 Synthesized Theoretical Findings

This paper evaluated the structural relationship between internal migration and urban infrastructure stress in Almaty, Kazakhstan. By analyzing macro-demographic trends and sector-specific impacts, this study yields several key conclusions.

First, internal migration in Kazakhstan has transitioned from a temporary post-Soviet adjustment into a structural spatial process. Driven by deep regional socio-economic disparities, the accelerating flow of populations from lagging rural areas and small towns to major metropolitan centers is a rational response to wage, employment, and institutional opportunities. Neoclassical and Harris-Todaro models explain why this migration persists despite rising urban living costs and precarity, as migrants prioritize expected long-term upward mobility.

Second, this demographic concentration has generated severe pressure across Almaty's urban infrastructure. The mismatch between rapid population growth and municipal capacity is visible across several key sectors:

- **Housing:** High demand has driven up real estate and rental prices, pricing low-income families out of the central market and fueling the unregulated growth of peri-urban informal settlements.
- **Transport:** Spatial division between peripheral housing and central employment zones has created severe traffic congestion, long commute times, and overloaded public transit systems.
- **Utilities:** Centralized water, sewage, and energy grids are operating at capacity limits, leaving under-serviced peri-urban fringes vulnerable.

●**Environment:** Trapped emissions from coal-based heating, transport, and thermal power plants have caused severe winter air pollution, with concentrations reaching ten times the recommended WHO guidelines.

These findings demonstrate that managing Almaty's urban growth requires shifting from reactive, local planning to proactive, integrated, and multi-scalar regional governance.

6.2 Sectoral Policy Interventions for Almaty

To build a sustainable urban model, municipal and national policymakers should coordinate actions across several key areas:

6.2.1 Inclusive Housing and Peri-Urban Integration

- **Expand Affordable Housing Initiatives:** Municipal authorities should shift fiscal focus from high-end real estate development to the construction of subsidized, affordable municipal housing. This social housing should be strategically located in master-planned urban zones with existing transit and utility access.
- **Formalize and Retrofit Peri-Urban Settlements:** Instead of treating suburban settlements as informal, the city should systematically integrate Alatau, Nauryzbai, and adjacent districts into formal municipal development plans. This requires targeted capital investments to extend paved roads, centralized water supplies, and wastewater treatment to these areas, curbing unregulated sprawl.

6.2.2 Sustainable Transit-Oriented Development

- **Implement Transit-Oriented Development (TOD):** Future urban expansion should align with high-capacity public transit corridors. The city should prioritize expanding the Almaty Metro and Bus Rapid Transit (BRT) lines directly into peripheral residential zones, reducing reliance on private vehicles.
- **Green and Modernize the Transit Fleet**: Policymakers should accelerate the conversion of the municipal bus fleet to clean electric and CNG systems, and invest in alternative mobility networks, such as dedicated cycling and pedestrian paths, to relieve central congestion.

6.2.3 Environmental and Utility Modernization

- Accelerate Energy Transition and Gasification: The national government must expedite the environmental modernization of Almaty's Combined Heat and Power Plants, transitioning them from coal to natural gas. Simultaneously, the city should expand centralized gasification networks to peri-urban communities, eliminating reliance on individual coal-fired domestic stoves.
- Enforce Emission Standards: Authorities should implement stricter vehicle emission controls, restrict heavy cargo vehicles from entering the city center during peak hours, and strengthen independent, real-time air quality monitoring systems.

6.3 Regional and National Spatial Strategies

- Develop Secondary Urban Hubs: To reduce demographic pressure on Almaty and Astana, national development policies must prioritize economic diversification in secondary cities

and regional centers. This requires targeted investments in industrial parks, agro-processing, and regional educational institutions to retain local human capital.

- Revitalize Rural Social Infrastructure: Broadening access to quality healthcare, specialized education, and basic utilities in southern and western sending regions will help mitigate the sharp regional inequalities that drive rural-to-urban migration, fostering a more balanced spatial distribution of Kazakhstan's population.

6.4 Concluding Assessment

The spatial analysis conducted in this study demonstrates that internal migration is not merely a transient demographic phenomenon, but an active, structural force that continuously reconfigures the physical and environmental systems of Almaty. The persistent inflow of young, economically motivated populations represents a valuable source of human capital, yet its concentration in an under-capitalized urban environment threatens the long-term sustainability of the metropolis. Resolving the physical contradictions of this growth—visible in the housing affordability crisis, transport bottlenecks, and severe winter air pollution—demands a shift away from short-term municipal planning. Only through a combination of local infrastructure retrofitting and macro-level regional stabilization can Kazakhstan align the spatial mobility of its citizens with the ecological and structural thresholds of its urban centers.

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The Impact of AI-Generated vs. Human-Created Advertising on Brand Trust, Loyalty, and Emotional Attachment: A Comparative Study Among Generation Z in Kazakhstan

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ABSTRACT

This study examines how AI-generated and human-created advertising influence perceived authenticity, brand trust, brand loyalty, and emotional attachment among Generation Z consumers in Kazakhstan. Drawing on signaling theory and relationship marketing theory, the paper compares cognitive and emotional responses to advertising content created by artificial intelligence and by humans. A quantitative cross-sectional survey was conducted with 220 Generation Z respondents exposed to both AI-generated and human-created advertisements for globally recognized brands. Measurement reliability and validity were assessed through confirmatory factor analysis, Cronbach's alpha, composite reliability, average variance extracted, and correlation analysis. Hypotheses were tested using regression-based analyses and the PROCESS Macro in SPSS. The results show that perceived authenticity and brand trust significantly increase brand loyalty in both advertising contexts. These effects are stronger for AI-generated advertising, suggesting that consumers rely heavily on authenticity and trust cues when the source of communication is artificial. Human-created advertising, however, demonstrates a stronger ability to foster emotional attachment, particularly through perceptions of warmth, sincerity, and relational meaning. Brand loyalty partially mediates the effects of authenticity and trust on emotional attachment in both contexts. Brand familiarity moderates relationships mainly in human-generated advertising, while prior AI experience does not significantly moderate AI-generated advertising effects. The findings indicate that AI and human creativity should be treated as complementary rather than substitutive resources in advertising strategy.

KEYWORDS

AI-generated advertising; human-created advertising; perceived authenticity; brand trust; brand loyalty; emotional attachment; Generation Z; Kazakhstan

1 INTRODUCTION

Artificial intelligence is transforming advertising by enabling firms to automate content production, personalize messages, test variations at scale, and optimize campaigns using large volumes of consumer data. In digital environments where audiences are fragmented and attention is scarce, AI-generated advertising offers important operational advantages: speed, scalability, targeting precision, and analytical consistency (Davenport et al., 2020; Dwivedi et al., 2023; Huang & Rust, 2021; Li, 2019). For brands, these capabilities can reduce production costs and improve the relevance of communication. For consumers, however, the source of advertising content may influence how the message is interpreted.

The central issue is not simply whether AI can generate persuasive advertising. Rather, the issue is whether AI-generated advertising can produce the same relational outcomes as human-created advertising. Advertising does not only communicate product information; it also signals brand intentions, credibility, creativity, sincerity, and emotional meaning. Human-created

advertising is often associated with intentionality, cultural understanding, storytelling, and emotional nuance (Escalas, 2004; Morhart et al., 2015). AI-generated advertising may be efficient and personalized, but consumers may perceive it as less authentic or less emotionally sincere, especially when they recognize the artificial origin of the content (Longoni et al., 2019; Yin et al., 2024).

This question is especially relevant for Generation Z. As a digitally native group, Generation Z consumers are frequently exposed to algorithmic recommendations, AI-powered tools, and automated content. At the same time, they are also highly sensitive to authenticity, transparency, and the perceived sincerity of brand communication. Kazakhstan provides a meaningful emerging-market context for studying these responses because AI-driven marketing practices are becoming more visible, while empirical evidence on consumer responses remains limited.

The purpose of this paper is to examine how AI-generated and human-created advertising affect perceived authenticity, brand trust, brand loyalty, and emotional attachment among Generation Z consumers in Kazakhstan. The study integrates signaling theory and relationship marketing theory to explain how consumers first interpret advertising signals and how these interpretations develop into loyalty and emotional bonds. It also examines whether brand familiarity and prior experience with AI technologies shape these relationships.

This paper contributes to the literature in three ways. First, it offers a direct comparison of AI-generated and human-created advertising within a single analytical framework. Second, it connects cognitive evaluations, such as authenticity and trust, with relational outcomes, such as loyalty and emotional attachment. Third, it adds empirical evidence from Kazakhstan, an emerging-market context that is underrepresented in AI advertising research.

2 LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

2.1 AI-generated and human-created advertising

AI-generated advertising refers to promotional content developed or adapted through artificial intelligence systems, machine learning algorithms, or generative tools with limited direct human involvement. Such systems can generate textual, visual, and multimedia content, test performance variations, and personalize communication based on user data (Davenport et al., 2020; Dwivedi et al., 2023; Li, 2019). These capabilities make AI-generated advertising attractive in highly competitive digital markets where speed and personalization matter.

Human-created advertising, by contrast, relies primarily on human creativity, emotional insight, strategic judgment, and cultural interpretation. Its strength lies in the capacity to communicate meaning through narrative, symbols, empathy, and lived experience. Storytelling allows consumers to process brand messages emotionally and connect them with personal identity (Escalas, 2004). Accordingly, human-created advertising may be more effective when the strategic objective is to build emotional resonance and long-term brand relationships.

Existing literature suggests that the difference between AI-generated and human-created advertising is not only technological. It is interpretive. Consumers evaluate advertising not merely by its content, but also by the perceived origin and intent behind that content. When a message is produced by humans, consumers may infer effort, sincerity, and creative intention. When a message is produced by AI, consumers may infer efficiency and technical sophistication, but also artificiality or lower emotional depth (Huang & Rust, 2021; Longoni et al., 2019; Yin et al., 2024).

2.2 Signaling theory and relationship marketing theory

Signaling theory explains how consumers evaluate messages when information is incomplete or uncertain. Advertising functions as a signal through which consumers infer unobservable brand qualities, including credibility, quality, sincerity, and intention (Erdem & Swait, 1998; Kirmani & Rao, 2000). In AI-generated advertising, uncertainty may be higher because consumers may question whether the message reflects genuine brand values or merely algorithmic optimization. Under such conditions, perceived authenticity and brand trust become particularly important signals.

Perceived authenticity reflects the extent to which communication is experienced as genuine, sincere, and credible (Napoli et al., 2014; Morhart et al., 2015). Authenticity reduces skepticism and supports positive brand evaluations. Brand trust refers to consumers' willingness to rely on a brand's reliability, integrity, and competence (Chaudhuri & Holbrook, 2001; Morgan & Hunt, 1994). In AI-generated advertising, trust may operate as a compensating mechanism: when human intention is less visible, consumers may rely more strongly on the broader trustworthiness of the brand.

Relationship marketing theory extends the analysis from initial evaluation to longer-term consumer-brand relationships. Trust and loyalty are central mechanisms of relationship development (Morgan & Hunt, 1994). Brand loyalty captures consumers' commitment, preference, and intention to continue supporting a brand (Chaudhuri & Holbrook, 2001; Oliver, 1999). Emotional attachment represents a deeper affective bond characterized by closeness, affection, and identification (Malär et al., 2011; Park et al., 2010). In this study, loyalty is examined not only as an outcome but also as a mediator through which authenticity and trust may lead to emotional attachment.

The integration of these theories provides a useful framework. Signaling theory explains why authenticity and trust matter in evaluating AI and human advertising. Relationship marketing theory explains how these evaluations can translate into loyalty and emotional attachment. Together, they allow the study to examine both cognitive and emotional dimensions of consumer response.

2.3 Hypotheses

The study proposes that perceived authenticity and brand trust positively affect brand loyalty in both AI-generated and human-created advertising. Because AI-generated advertising may create uncertainty about sincerity and human intent, authenticity and trust are expected to be especially important in the AI context. The study also proposes that brand loyalty positively affects emotional attachment and mediates the effects of authenticity and trust on emotional attachment. Finally, brand familiarity and prior AI experience are examined as moderating factors. Brand familiarity may change the degree to which consumers rely on message-level cues, while AI experience may influence how consumers interpret AI-generated communication.

Table 1. Summary of hypotheses

Code	Hypothesis
H1a/H1b	Perceived authenticity positively affects brand loyalty in AI-generated and human-created advertising.
H2a/H2b	Brand trust positively affects brand loyalty in AI-generated and human-created advertising.

H3a/H3b	Brand familiarity moderates the relationship between perceived authenticity and brand loyalty.
H4a/H4b	Brand familiarity moderates the relationship between brand trust and brand loyalty.
H5a/H5b	AI experience moderates the relationships between perceived authenticity or brand trust and brand loyalty in AI-generated advertising.
H6a/H6b	Brand loyalty positively affects emotional attachment in both advertising contexts.
H7a/H7b	Perceived authenticity positively affects emotional attachment in both advertising contexts.
H8a/H8b	Brand trust positively affects emotional attachment in both advertising contexts.
H9/H10	Brand loyalty mediates the effects of perceived authenticity and brand trust on emotional attachment.

3 METHODOLOGY

3.1 Research design and sample

The study used a quantitative cross-sectional survey design with an embedded comparative advertising stimulus. Respondents were exposed to both AI-generated and human-created advertising stimuli and then evaluated each advertisement using the same measurement framework. The use of a consistent evaluation structure made it possible to compare responses across advertising sources while controlling for the key constructs of interest.

The target population was Generation Z consumers in Kazakhstan. A non-probability convenience sampling method was used because it enabled timely access to digitally active respondents who were familiar with online advertising environments. The final dataset contained 220 valid responses. The sample was suitable for regression-based analysis, mediation analysis, and moderation testing. Ethical principles were followed: participation was voluntary, responses were anonymous, no personally identifiable information was collected, and data were used only for academic purposes.

The survey used advertisements associated with two globally recognized brands, Apple and Nike. Respondents evaluated AI-generated and human-created versions of advertising content. These brands were selected because they are widely known among young consumers and allow the study to examine the role of brand familiarity alongside perceptions of AI-generated communication.

3.2 Measures and data analysis

All key constructs were measured using multi-item scales adapted from established literature. AI experience was adapted from Venkatesh et al. (2012). Perceived authenticity was adapted from Napoli et al. (2014). Brand familiarity was adapted from Kent and Allen (1994). Brand trust was adapted from Chaudhuri and Holbrook (2001) and Delgado-Ballester (2004).

Brand loyalty was adapted from Zeithaml et al. (1996) and Oliver (1999), and emotional attachment was adapted from Thomson et al. (2005). Responses were recorded on five-point Likert-type scales.

Data analysis proceeded in several stages. First, descriptive statistics and frequency distributions were examined to screen the dataset. Second, reliability and validity were assessed through Cronbach's alpha, composite reliability, average variance extracted, and confirmatory factor analysis in AMOS. Third, correlation analysis was conducted to examine associations among constructs. Finally, the hypotheses were tested using regression-based analyses and the PROCESS Macro in SPSS, which allowed direct, mediating, and moderating effects to be assessed within the proposed framework.

4 RESULTS

4.1 Sample characteristics and measurement quality

The sample consisted of 220 Generation Z respondents. The largest age group was 19 to 21 years old, representing 36.8% of the sample. Gender distribution was balanced, with 52.7% male and 47.3% female respondents. Most respondents were undergraduate students, representing 56.8% of the sample. The respondents were digitally active: 37.3% reported using social media for one to three hours daily, 23.6% for three to five hours, and 24.5% for more than five hours. AI familiarity was also substantial: 31.8% described themselves as very familiar with AI technologies and 28.2% as moderately familiar.

Measurement results indicated strong reliability and validity. Across the constructs, Cronbach's alpha values ranged from 0.856 to 0.962, composite reliability values ranged from 0.934 to 0.963, and average variance extracted values ranged from 0.780 to 0.865. These values exceed commonly accepted thresholds and support the reliability and convergent validity of the measurement model. Descriptive findings showed that respondents rated human-created advertisements higher than AI-generated advertisements across perceived authenticity, brand trust, brand loyalty, and emotional attachment. This initial pattern suggests that advertising source influences consumer evaluations, particularly in relation to emotional and authenticity-based perceptions.

Table 2. Respondent profile

Characteristic	Main result
Age	19 to 21 years: 36.8%; 16 to 18 years: 20.5%; 22 to 24 years: 21.4%; 25 to 27 years: 21.4%
Gender	Male: 52.7%; Female: 47.3%
Education	Undergraduate: 56.8%; High school: 22.3%; Graduate: 20.9%
Daily social media usage	1 to 3 hours: 37.3%; 3 to 5 hours: 23.6%; more than 5 hours: 24.5%
AI technology familiarity	Very familiar: 31.8%; moderately familiar: 28.2%; slightly familiar: 23.2%; not familiar: 16.8%
Brand experience with Apple and Nike	Frequently use: 31.8%; occasionally use: 29.5%; used once: 16.8%; never used: 21.8%

4.2 Direct and moderating effects

The hypotheses received broad empirical support. Perceived authenticity positively affected brand loyalty in both AI-generated advertising (beta = 0.667, $p < .001$) and human-created advertising (beta = 0.435, $p < .001$). The stronger coefficient for AI-generated advertising suggests that when consumers evaluate machine-produced content, authenticity becomes a particularly important signal for reducing uncertainty and supporting loyalty.

Brand trust was the strongest predictor of loyalty in the model. It had a significant positive effect on loyalty in AI-generated advertising (beta = 0.819, $p < .001$) and human-created advertising (beta = 0.605, $p < .001$). Again, the effect was stronger in the AI condition. This suggests that consumers do not evaluate AI-generated advertisements only by their visual or textual quality. They also rely heavily on whether the brand behind the communication is credible and dependable.

The moderating effects were more selective. Brand familiarity did not significantly moderate the authenticity-loyalty or trust-loyalty relationships for AI-generated advertising. In other words, familiarity with the brand did not substantially weaken or strengthen the importance of authenticity and trust in the AI condition. For human-created advertising, however, brand familiarity significantly moderated both the authenticity-loyalty relationship and the trust-loyalty relationship. This indicates that when consumers evaluate human-created advertisements, prior knowledge of the brand can change how strongly they rely on the specific ad's authenticity and trust cues.

Prior AI experience did not significantly moderate the relationships between perceived authenticity or trust and brand loyalty in AI-generated advertising. This finding is important because it challenges the assumption that greater familiarity with AI automatically reduces skepticism. Even respondents with AI experience continued to evaluate AI-generated advertising through authenticity and trust. Technological familiarity, therefore, does not replace emotional credibility.

Table 3. Summary of hypothesis testing results

Hypothesis	Relationship	Beta	p-value	Result
H1a	Authenticity -> Loyalty (AI)	0.667	< .001	Supported
H1b	Authenticity -> Loyalty (Human)	0.435	< .001	Supported
H2a	Trust -> Loyalty (AI)	0.819	< .001	Supported
H2b	Trust -> Loyalty (Human)	0.605	< .001	Supported
H3a	Authenticity x Familiarity (AI)	0.007	.890	Not supported
H3b	Authenticity x Familiarity (Human)	-0.081	.027	Supported
H4a	Trust x Familiarity (AI)	-0.001	.983	Not supported

H4b	Trust x Familiarity (Human)	-0.185	< .001	Supported
H5a	Authenticity x AI Experience (AI)	-0.009	.849	Not supported
H5b	Trust x AI Experience (AI)	-0.013	.762	Not supported
H6a	Loyalty -> Attachment (AI)	0.291	< .001	Supported
H6b	Loyalty -> Attachment (Human)	0.346	< .001	Supported
H7a	Authenticity -> Attachment (AI)	0.639	< .001	Supported
H7b	Authenticity -> Attachment (Human)	0.367	< .001	Supported
H8a	Trust -> Attachment (AI)	0.553	< .001	Supported
H8b	Trust -> Attachment (Human)	0.637	< .001	Supported

Note: $p < .001$ and $p < .05$ indicate statistical significance. ns relationships were not supported.

4.3 Mediation effects

The study also tested whether brand loyalty mediates the effects of perceived authenticity and brand trust on emotional attachment. The results supported mediation in both advertising contexts. In AI-generated advertising, authenticity increased loyalty, loyalty increased emotional attachment, and the direct effect of authenticity on attachment remained significant after loyalty was included. This indicates partial mediation. In human-created advertising, the same pattern was found.

A similar pattern emerged for brand trust. Trust strongly predicted loyalty in both AI-generated and human-created advertising, and loyalty significantly predicted emotional attachment. The direct effects of trust on emotional attachment remained significant, indicating partial mediation. The mediation findings suggest that loyalty is an important bridge between cognitive evaluations and deeper emotional outcomes. This bridge appears especially meaningful in AI-generated advertising, where consumers may first need to develop confidence and loyalty before emotional attachment can emerge.

Table 4. Mediation effects through brand loyalty

Path	Key coefficients	Result
Authenticity -> Loyalty -> Emotional attachment (AI)	a = 0.669, b = 0.672, c = 0.659, c' = 0.210, p = .001	Partial mediation supported
Authenticity -> Loyalty -> Emotional attachment (Human)	a = 0.579, b = 0.561, c = 0.634, c' = 0.307, p = .001	Partial mediation supported
Trust -> Loyalty -> Emotional attachment (AI)	a = 0.802, b = 0.581, c = 0.754, c' = 0.288, p = .001	Partial mediation supported
Trust -> Loyalty -> Emotional attachment (Human)	a = 0.743, b = 0.326, c = 0.803, c' = 0.561, p = .001	Partial mediation supported

5 DISCUSSION

The findings show that AI-generated and human-created advertising can both support consumer-brand relationships, but they do so through different psychological mechanisms. AI-generated advertising appears to rely more strongly on cognitive reassurance. In the AI condition, authenticity and trust had stronger effects on loyalty than in the human-created condition. This pattern is consistent with signaling theory: when the source of communication is artificial, consumers may experience greater uncertainty and therefore rely more on signals that reduce perceived risk.

Human-created advertising, by contrast, appears to have a stronger emotional advantage. While authenticity and trust also matter in the human condition, human-created advertising had stronger connections to emotional attachment, especially through perceptions of sincerity, warmth, and storytelling. This finding supports relationship marketing theory and the view that emotional attachment develops through meaningful, affective, and identity-relevant interactions (Escalas, 2004; Park et al., 2010).

The non-significant moderation effects of AI experience are particularly noteworthy. Generation Z respondents may be digitally active and familiar with AI tools, but familiarity does not automatically translate into trust. This suggests that the strategic challenge for AI-generated advertising is not merely technological adoption. The challenge is relational: brands must make AI-generated messages feel credible, transparent, and aligned with authentic brand values.

The selective role of brand familiarity also deserves attention. In human-created advertising, familiarity moderated the effects of authenticity and trust on loyalty. This suggests that when consumers already know the brand, their loyalty may depend less on one advertisement and more on accumulated brand experience. In AI-generated advertising, however, familiarity did not significantly alter the role of authenticity and trust. This implies that AI-generated content may be evaluated through a more content-specific and credibility-focused lens, even when the brand is familiar.

5.1 Theoretical implications

This study advances authenticity research by showing that authenticity remains a powerful determinant of loyalty in both AI-generated and human-created advertising. The stronger authenticity effect in the AI context suggests that authenticity is not made irrelevant by

technological sophistication. On the contrary, it becomes more important when the communication source raises uncertainty.

The study also reinforces relationship marketing theory by demonstrating that brand trust remains a core mechanism of loyalty formation. In AI-generated advertising, trust becomes especially important because consumers may question whether the content is sincere, reliable, and aligned with brand intentions. The findings also extend emotional attachment theory by showing that the route to attachment depends on advertising source. Human-created advertising can foster emotional attachment more directly, while AI-generated advertising appears to require an intermediate loyalty-building stage.

Finally, the study contributes emerging-market evidence from Kazakhstan. Much AI advertising research has focused on Western contexts. By examining Generation Z consumers in Kazakhstan, the study broadens the empirical base for understanding how young consumers in digitally developing markets evaluate AI-generated communication.

5.2 Managerial implications

For managers, the results indicate that AI-generated advertising should not be treated as a complete replacement for human creativity. AI can be useful for personalization, campaign variation, and efficient content production. However, brands must protect authenticity and trust when using AI. If AI-generated content feels artificial, manipulative, or disconnected from brand values, it may weaken the very relationships that advertising is meant to build.

Human-created advertising remains valuable when the objective is emotional attachment. Campaigns that depend on storytelling, cultural meaning, identity, empathy, or premium positioning should retain strong human creative direction. AI may assist with production and personalization, but human judgment is still needed to preserve emotional depth.

The most practical conclusion is that firms should adopt a hybrid strategy. AI can support scale, testing, and relevance, while human creativity can guide emotional storytelling and brand meaning. The goal is not to choose between AI and human creativity, but to allocate each to the role it performs best. AI should strengthen operational efficiency; human creativity should protect sincerity, emotional resonance, and long-term relational value.

6 LIMITATIONS AND FUTURE RESEARCH

Several limitations should be acknowledged. First, the sample consisted only of Generation Z consumers in Kazakhstan. Although this segment is highly relevant for AI advertising research, the findings may not generalize to other generations, countries, or cultural contexts. Second, the study used a cross-sectional design, which captures perceptions at a single point in time. Consumer acceptance of AI-generated advertising may change as exposure to AI tools increases and the quality of generated content improves.

Third, the study examined advertising stimuli associated with Apple and Nike. Responses may differ for local brands, luxury brands, service brands, financial services, healthcare, or low-involvement product categories. Fourth, the study relied on self-reported survey data, which may introduce common method bias or social desirability bias. Fifth, the study focused on authenticity, trust, loyalty, emotional attachment, brand familiarity, and AI experience. Future research could examine additional constructs such as perceived creativity, privacy concern, ethical sensitivity, AI disclosure, transparency, and consumer skepticism.

Future studies should consider longitudinal or experimental designs that manipulate AI disclosure, emotional tone, personalization intensity, and brand category. Researchers may also

compare fully AI-generated advertisements with hybrid human-AI advertisements, which may better reflect current industry practice. Cross-cultural studies would further clarify whether consumer responses to AI-generated advertising differ across emerging and developed markets.

7 CONCLUSION

This study examined how AI-generated and human-created advertising influence Generation Z consumers in Kazakhstan. The findings show that both advertising types can generate positive consumer responses, but they operate through different mechanisms. AI-generated advertising is effective at building brand loyalty when consumers perceive the message and the brand as authentic and trustworthy. Human-created advertising is more effective at fostering emotional attachment, reflecting the importance of warmth, sincerity, and human meaning in brand relationships.

The results suggest that the future of advertising should not be framed as a competition between AI and human creativity. AI offers efficiency, personalization, and scalability, but human creativity remains critical for emotional connection and authentic brand meaning. Effective advertising in the digital era requires integration: using AI where it strengthens performance and using human creativity where consumers need trust, empathy, and emotional resonance.

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The impact of corporate governance on the performance of companies in Kazakhstan

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ABSTRACT

Recent academic research demonstrates that effective corporate governance is one of the most important factors in improving organizational performance, particularly in countries with economies in transition. This research has established that corporate governance mechanisms, such as the structure of the board of directors, the independence of its members, and the overall level of disclosure, have a key influence on the financial performance and market value of specific companies. At the same time, the academic literature indicates that in developing economies, including the Republic of Kazakhstan, these relationships remain understudied and yield mixed results depending on the institutional environment and ownership structure.

This research aims to analyze the impact of corporate governance on the performance of commercial organizations in the Republic of Kazakhstan. The analysis utilized panel data on Kazakhstani companies compiled from open sources, including financial statements, corporate reports and stock market data for a specific period. Econometric analysis was also employed in this research, enabling an assessment of the impact of corporate governance quality, the proportion of independent directors, and the overall level of disclosure on companies' financial performance and market valuation.

KEYWORDS: corporate governance, company performance, board of directors, independent directors, disclosure, market value, Kazakhstan.

1 INTRODUCTION

1.1 Economic background

Corporate governance is a key element of modern organizational management theory and practice, as it defines the fundamental mechanisms for reconciling the interests of various participants in economic relations, including shareholders, managers, creditors and other stakeholders (Shleifer & Vishny, 1997). In the current context of financial market globalization, growing international competition and increasing investor demands for transparency, corporate governance standards are becoming critically important for the stable operation of companies.

For emerging market countries, such as the Republic of Kazakhstan, corporate governance issues are of key importance due to the transition from a centralized planned economy to a market model. During the economic reforms that began in the 1990s, most of the corporate sector was privatized, while ownership remained highly concentrated and state institutions continued to exert considerable influence over the activities of large organizations (Claessens & Yurtoglu, 2013). These characteristics of Kazakhstan create a specific environment in which corporate governance mechanisms operate differently from those in economically developed countries.

1.2 Introducing Corporate Governance

During the study of scientific sources, it was established that the concept of corporate governance is viewed as a set of mechanisms, institutions, and procedures that ensure such aspects as: observance of shareholders' rights, control over management activities, and rational allocation of resources of a particular organization (Shleifer & Vishny, 1997). The agency theory proposed by Jensen and Meckling (1976), serves as one of the fundamental theoretical foundations of corporate governance. According to this concept, the separation of ownership and control creates agency conflicts, as managers who run an organization may act in their own interests, which may conflict with the interests of business owners.

Various corporate governance mechanisms are proposed to reduce agency costs, including: developing an optimal board structure, appointing independent directors, creating specialized committees, and ensuring a high level of disclosure (Hermalin & Weisbach, 2003). In this context, international standards emphasize that such mechanisms contribute to greater transparency, increased investor confidence, and more effective risk management (OECD, 2015).

It is noteworthy to mention that empirical studies in developed economies demonstrate a positive relationship between the quality of corporate governance and the immediate performance of such companies, including financial indicators and market value (Brown & Caylor, 2006; Bhagat & Bolton, 2008).

1.3 Objectives of the Study

The main objective of this study is to analyze the impact of key corporate governance mechanisms on the performance indicators of companies operating in the domestic market. In particular, the study focused on characteristics such as the structure and independence of the board of directors, concentration of ownership, and the level of transparency of corporate reporting. Achieving this research goal will provide a clearer understanding of which elements of corporate governance have the greatest impact on the financial and market performance of organizations.

Objectives:

1. To study the theoretical foundations of corporate management and its measurement in international practice.
2. To systematize empirical scientific research on the impact of corporate governance on efficiency.
3. To create an econometric model based on panel data from domestic companies.
4. To assess the significance of individual corporate governance mechanisms.
5. To develop practical recommendations for corporate governance and regulatory policy in the Republic of Kazakhstan.

1.4 Purposes of the Study and its Benefits

Based on an analysis of scientific literature, it was found that, despite a significant number of studies devoted to corporate governance and its impact on company performance, only a small number of studies examine this relationship in the context of emerging economies. It is important to note that most existing studies focus on developed markets, where the institutional environment, investor protection mechanisms and corporate governance practices are much better established. Based on these factors, there is a need for a more detailed study of how corporate governance

characteristics affect the performance of companies in the Republic of Kazakhstan, where the corporate control system and corporate governance institutions are still developing.

1.5 Research Questions

The main questions addressed by this scientific study are: Is there a statistically significant relationship between corporate management mechanisms and company performance indicators in the Republic of Kazakhstan? Which elements of corporate governance have the greatest impact? Do the identified dependencies remain after controlling for confounding variables? What is the specific nature of the influence of corporate governance in the institutionally unique environment of the Republic of Kazakhstan? The purpose of this study is to answer these questions.

2 LITERATURE REVIEW

2.1 Theoretical foundations of corporate governance

One of the key theoretical foundations for the study of corporate governance in the modern world is the aforementioned agency theory, which was formulated in Jensen and Meckling's classic work 'Theory of the Firm: Managerial Behaviour, Agency Costs and Ownership Structure' (Jensen & Meckling, 1976). This theory explains the nature of the relationship between company owners and managers, as well as the economic consequences of the separation of ownership and control functions in business.

According to agency theory, an organization is represented as a complex of contractual relationships between various economic entities. Within this model, shareholders act as principals, and managers act as agents to whom the right to manage the company is delegated. Since managers make decisions on behalf of capital owners, there is a potential risk that their personal interests may not coincide with those of shareholders (Jensen & Meckling, 1976).

The main problem in agency theory is agency conflict, which can arise due to asymmetry in the flow of information, as well as differences in motivation between the principal and the agent. It should be emphasized that managers have more complete information about the activities of a particular organization and can use this information to make decisions that will maximize their own profits rather than the value of the company.

This results in agency costs, which include:

1. the costs of monitoring managers' activities by shareholders.
2. costs of creating incentive and control mechanisms.
3. losses in efficiency resulting from ineffective management decisions.

In their 1976 paper, Jensen and Meckling argue that effective corporate governance mechanisms can significantly reduce agency costs (Jensen & Meckling, 1976). Such mechanisms include: an independent board of directors, internal control systems, ownership structure, and transparency of information disclosure. This theoretical model assumes that improving corporate governance directly contributes to better alignment of the interests of managers and shareholders, which, in turn, should lead to increased efficiency of a particular organization.

It should be noted that the provisions of agency theory have gained widespread recognition in corporate governance research and have become one of the most widely used theoretical foundations in corporate finance and organizational economics. As an example, the main task of corporate governance is to provide mechanisms that allow investors to guarantee a return on invested capital (Shleifer & Vishny, 1997).

Empirical analysis of the scientific literature also confirmed the importance of agency theory for analyzing the effectiveness of companies. In particular, the characteristics of the board of directors and the immediate ownership structure can have a key impact on the financial performance of a particular organization (Bhagat & Bolton, 2008). Similar conclusions were also reached in the analysis of scientific literature, which found that organizations with higher levels of corporate governance demonstrate higher market value and higher business process efficiency indicators (Brown & Caylor, 2006).

Agency theory is also supported by the fact that in emerging market countries, improvements in corporate governance are directly linked to higher operational efficiency of companies and higher market valuation (Klapper & Love, 2004).

The agency theory was further developed in the work 'Separation of Ownership and Control' (Fama & Jensen, 1983). In this scientific work, the authors expanded the original concept of relationships and proposed a more detailed model of corporate governance structure. This scientific publication also considers companies as decision-making systems within which different participants perform different functions. In this context, the authors identify two key stages in the decision-making process (Fama & Jensen, 1983):

1. Initiation and implementation of decisions.
2. Control and approval of decisions.

One of the most important conclusions identified in the analysis of scientific literature is the assertion that effective corporate governance requires the management of organizations to separate management and control functions. In this case, the board of directors should act as an independent monitoring and control body that supervises managers and protects the interests of shareholders.

Within this concept, the presence of independent directors who are not involved in the day-to-day management of the company and are therefore able to objectively evaluate the actions of management is of particular importance. The presence of independent board members is seen as an important tool for reducing agency conflicts and improving the effectiveness of corporate governance (Fama & Jensen, 1983).

At the same time, one study showed that the level of investor protection varies significantly between countries and also has a significant impact on the development of financial markets and the corporate sector (La Porta et al., 1998). The authors of this scientific work concluded that countries with stronger legal protection for investors are characterized by a more developed stock market and a higher level of company capitalization.

It should be emphasized that an important milestone in the development of international corporate governance standards was the formation of the Organization for Economic Co-operation and Development's Principles of Corporate Governance. These principles were first published in 1999. They have been updated several times since then. The latest significant revision was presented as part of the G20/OECD Principles of Corporate Governance (OECD, 2015).

The OECD Principles have become one of the most widely recognized international standards in the field of corporate governance and are actively used by governments, international organizations and corporate structures in the creation of national corporate governance codes. The main objective of these principles is to increase the level of transparency, accountability and effectiveness of corporate governance.

According to the OECD (2015), an effective corporate governance system should ensure the following elements:

1. protection of shareholders' rights and equal treatment of shareholders;
2. recognition of the rights of other stakeholders;
3. timely and reliable disclosure of information about the company's activities;

4. effective functioning of the board of directors.

In the Republic of Kazakhstan, the OECD principles are also used as a basis for the formation of national corporate governance standards, particularly in state-owned and quasi-state-owned companies. Their integration is aimed at increasing the transparency of management, improving the monitoring and control system, and increasing the overall investment attractiveness of Kazakh companies.

2.2 Corporate governance and company performance

It is crucial to highlight that empirical studies of corporate governance in developed countries, which were discovered during scientific work, have formed a significant theoretical and statistical basis that confirms the link between corporate governance mechanisms and company performance. One of the most relevant mechanisms is the structure of the board of directors.

As an example, we can cite the 2010 study by Duchin, Matsusaka, and Ozbas, which demonstrated that the influence of independent directors on company performance depends on the availability of information within the firm (Duchin, et.al., 2010). Using data from American companies, the authors found that a direct increase in the proportion of independent directors leads to an increase in the efficiency of a particular organization when the asymmetry in the information flow is relatively small. However, when uncertainty is high, the influence of independent directors may be much less pronounced.

During the analysis of the literature, it was found that, unlike in developed economies, scientific research on corporate governance in emerging market countries has appeared relatively recently and often shows more ambiguous results. This information is related to the fact that the institutional environment in countries such as the Republic of Kazakhstan can differ significantly from the conditions in developed economies.

Some studies also emphasize the importance of corporate governance for small and medium-sized enterprises in developing countries. In particular, it has been found that the introduction of formalized corporate governance mechanisms, including audit, disclosure and board oversight systems, can significantly improve the operational efficiency of companies and increase their competitiveness in international markets.

Despite a significant amount of empirical research, the analysis of the impact of corporate governance faces a key methodological problem, which is expressed in endogeneity.

It is necessary to point out that endogeneity arises in specific cases when there is a two-way causal relationship between variables, as well as when the variables under analysis are influenced by a hidden factor that was not initially included in the model. In the context of this study, this means that not only can corporate governance influence a company's performance, but successful organizations can also integrate more sophisticated corporate governance mechanisms.

2.3 Corporate governance in countries with economies in transition

Corporate governance in countries with economies in transition, referred to in many academic sources as emerging markets, is shaped by an institutional environment that differs from that of developed economies. These differences are directly related to the peculiarities of the legal systems of these particular countries, the current level of development of financial markets, the established ownership structure of organizations, and the degree of state regulation of the economy. It should be noted that scientific literature indicates that institutional characteristics largely determine the nature and effectiveness of corporate governance mechanisms.

A key feature of countries with transitional economies is the relatively weak development of legal institutions and mechanisms for protecting investor rights (Young, et.al., 2008). This feature means that traditional corporate governance mechanisms used in countries with developed economies may function less effectively. Given this fact, alternative forms of control, including such instruments as concentration of ownership, participation of major shareholders, and informal institutional mechanisms, begin to play an important role.

These features are of key importance for the presented scientific research, as the Republic of Kazakhstan belongs to the category of countries with emerging markets, which means that the impact of corporate governance mechanisms on the effectiveness of the analyzed organizations may differ from the results obtained in developed economies.

At the same time, one of the most distinctive features of corporate governance in similar countries is the high concentration of ownership. In this context, it should be noted that, unlike developed countries, where the ownership structure is in most cases more distributed, in emerging economies a large share of the shares of organizations may belong to a limited number of major shareholders.

A study based on an analysis of more than 1,300 companies from eight East Asian countries demonstrated that the overall level of ownership concentration has a significant impact on company performance and market value (Claessens, et. al., 2002). The authors of this study found that moderate ownership concentration can contribute to increased corporate governance efficiency; however, in this relationship, excessive concentration can also lead to a decrease in the market valuation of companies due to risks for minority investors.

Another important characteristic for corporate governance is significant state participation in the corporate sector, which applies to countries such as Kazakhstan. In this context, the state can act as a shareholder in companies directly or through state holding companies and funds, which in turn creates a specific model of corporate governance.

First and foremost, state participation can provide specific organizations with access to financial resources, infrastructure and political support. This feature of state influence can have a positive impact on the stability and long-term development of organizations. At the same time, state participation can lead to a decrease in the performance of companies due to political interference in management and weak incentives to improve efficiency.

A study by Megginson and Netter demonstrated that the privatization of state-owned organizations in many countries led to an improvement in their financial performance (Megginson & Netter, 2001). The authors of this scientific work analyzed more than 200 organizations from 41 countries and concluded that after the privatization of state-owned companies, these entities began to demonstrate higher efficiency compared to the period of state management.

However, more recent scientific studies show that the impact of state participation can be ambiguous. For example, state participation can increase the overall level of transparency of companies and improve their access to financing, but at the same time it can reduce the effectiveness of corporate governance due to political goals that differ from the goals of profit maximization (Borisova, Brockman, et.al., 2012).

2.4 Research gap

Despite the significant number of scientific studies identified during the literature review, there remain a number of significant research gaps in contemporary scientific literature. These gaps can be explained by the current characteristics of the approaches used in the analysis, as well as the limited empirical base, particularly in countries with transitional economies. Within the framework of this scientific study, three key aspects of the research gap can be identified: the lack

of panel studies in the Republic of Kazakhstan; insufficient specification of the mechanisms of corporate governance's impact on labour productivity; and the ambiguity of the results obtained.

The first important aspect of the research problem is the lack of panel studies devoted to the domestic context. It should be emphasized that most empirical studies analyzing the impact of corporate governance are based on data from developed countries and exploit the statistical databases of large international panel studies (Akhmetova & Yessengeldin, 2017).

At the same time, studies devoted to the post-Soviet countries are fragmentary in nature and, in most cases, are based on limited samples or one-off surveys of enterprises. Scientific publications on the Republic of Kazakhstan tend to use cross-sectional data more often, which, in turn, makes it difficult to analyze the dynamics of indicators over time and limits the ability to identify cause-and-effect relationships. It is important to note that this lack of long-term panel observations directly leads to the analyzed impact on the economic performance of organizations being assessed indirectly, which also does not allow for reliable conclusions to be drawn about the long-term effects of investments in corporate governance (Nazarbayev University GSB, 2021).

The second aspect of the research gap in this area is the lack of specificity in the mechanisms by which corporate governance influences the performance of companies. Most of the scientific works studied assert that effective corporate governance mechanisms directly contribute to improving the performance of the organizations under consideration; nevertheless, these mechanisms are described in rather general terms (Tulegenova & Mussina, 2021).

The third significant aspect of the research gap under consideration is the ambiguity of the results presented in the scientific literature. Although a significant part of the research confirms the positive impact of developed corporate governance mechanisms on the efficiency of companies, there are also works in the scientific literature that demonstrate less ambiguous or even contradictory results. A number of empirical studies note that individual elements of corporate governance can have different effects on performance indicators depending on the institutional environment, ownership structure, or stage of development of the national economy. For example, a high concentration of ownership can simultaneously strengthen control over management and reduce the overall level of protection for minority shareholders. Similarly, an increase in the size of the board of directors is considered in some scientific studies to be a factor in improving the quality of corporate governance strategy control, while in other scientific works it is associated with an increase in the bureaucratization of management processes and a decrease in decision-making performance indicators.

2.5 Formulation of hypotheses

Based on the analysis of scientific literature and the theoretical propositions presented, the main hypotheses of this scientific study were formulated. As previously mentioned, corporate governance is viewed in modern economic theory as a system of mechanisms aimed at reducing agency costs, increasing the transparency of companies' activities, and protecting the interests of investors. According to this theoretical concept, effective corporate governance mechanisms make it possible to balance the interests of various parties involved in corporate relations and increase the efficiency of the company's resources (Shleifer & Vishny, 1997; OECD, 2015).

The following hypotheses are formulated within the framework of this study:

- A higher level of corporate governance quality is positively associated with a company's financial performance.

- A higher proportion of independent directors on the board of directors has a positive impact on a company's financial performance.
- A higher level of information disclosure is positively associated with a company's market valuation.

3 METHODOLOGY

3.1 Theoretical framework

The theoretical framework of this research is based on the key tenets of modern corporate management theory, which analyses the impact of control mechanisms and the distribution of authority within a company on its economic efficiency. The previously presented agency theory occupies a key and central place in this theoretical paradigm (Jensen & Meckling, 1976).

Furthermore, the theoretical framework of this research is based on the concept of 'principal–principal' conflicts, which are characteristic of countries with economies in transition. In the current conditions of high concentration of ownership, characteristic of the Republic of Kazakhstan, the main conflict arises not only between managers and shareholders, but also between different groups of owners. This aspect is most relevant for companies in which the state or controlling shareholders play an active role, thereby creating a risk of profit redistribution in favour of the controlling parties (Claessens & Yurtoglu, 2013).

In the context of this study, key elements of corporate governance are operationalized through specific measurable indicators. In particular, the structure of the board of directors is analyzed using the proportion of independent directors, determined on the basis of data from companies' annual financial statements and information disclosed on issuers' official websites and in reports published on the platforms of the Kazakhstan Stock Exchange (KASE).

Another significant element of the theoretical framework is the level of information disclosure. This indicator is assessed by analyzing: companies' annual reports, financial statements prepared in accordance with International Financial Reporting Standards (IFRS), as well as the volume and quality of information disclosed on corporate websites and in reports provided on the KASE platform and in the database of the Agency for the Regulation and Development of the Financial Market of the Republic of Kazakhstan.

A composite corporate governance quality index, formed on the basis of available indicators-including the structure of the board of directors, the overall level of disclosure, and specific ownership characteristics—can be considered an integral measure of corporate governance. The use of such indices is widespread in empirical research (Brown & Caylor, 2006; Klapper & Love, 2004), and it also allows for a comprehensive assessment of the level of corporate governance development within a company.

In turn, the dependent variables within this theoretical model are represented by indicators of the organization's performance. In this context, financial performance is assessed using indicators such as return on assets (ROA) and return on equity (ROE), which are calculated based on the organization's financial statements. In parallel, market performance is determined using market capitalization and Tobin's Q, the data for which is derived from KASE stock exchange information and open financial sources.

Based on the above, it can be argued that this research develops a theoretical model in which the performance of a specific organization is viewed as a function of the quality of corporate governance. Key explanatory variables include indicators such as: the level of corporate governance, the proportion of independent directors, and the level of disclosure. The use in this research of data obtained from open sources, such as KASE, company annual reports, databases

of international organizations (World Bank, OECD), as well as national statistical and regulatory resources, ensures the reliability and reproducibility of the empirical analysis presented.

3.2 Data description

This study falls within the category of quantitative research and is of an explanatory nature. In this context, the primary objective of this research is to identify and empirically test the causal relationships between corporate management characteristics and the performance indicators of specific companies. The use of a quantitative approach is justified by the established need to employ econometric methods of analysis, which allow the strength and direction of the influence of key variables to be assessed on the basis of statistical data.

The analysis period in this study covers the time span from 2018 to 2025. It should be noted that the choice of this period is due to the need to analyze the current stage of corporate governance development in the Republic of Kazakhstan, which is characterized by stricter disclosure requirements, the integration of international standards and the development of the stock market. In parallel with this, the specified time frame allows for the formation of an observation panel sufficient for conducting econometric analysis and the subsequent identification of consistent patterns.

It is crucial to highlight that the primary data sources in this research are companies' annual reports, which contain information on: the structure of corporate management within organizations, the composition of the board of directors, and statistical characteristics of ownership. In addition, data from the Kazakhstan Stock Exchange (KASE) and the Astana International Financial Centre (AIX) were utilized, which provide information on the market capitalization of specific organizations, share price movements and other market characteristics. At the same time, financial indicators are derived from financial statements prepared in accordance with International Financial Reporting Standards (IFRS), ensuring the comparability of data across companies and their compliance with international requirements.

It should be emphasized that the criteria for including specific organizations in the sample are determined by the availability and completeness of the disclosed information. This study included public companies of the Republic of Kazakhstan whose shares are traded on the KASE or AIX, subject to the mandatory condition of regular financial reporting, as well as a sufficient level of disclosure regarding corporate governance for the period under review. Additionally, the availability of data on the composition of the board of directors was taken into account, which included information on independent directors. In this context, organizations that did not provide complete or comparable information were excluded from the sample.

The sample size was determined based on the criteria outlined above, and includes a limited number of companies that meet the requirements for public disclosure and transparency. The final sample comprises 43 companies, which ensures sufficient data variability for conducting an empirical analysis.

To summarize the information presented above, it can be stated that the empirical basis established in this research provides a reliable foundation for conducting quantitative analysis and also allows for an objective assessment of the impact of corporate governance on the performance of companies in the Republic of Kazakhstan.

3.3 Variables description

Within the framework of this research study, the variables are formulated in accordance with the research objectives set, as well as the hypotheses aimed at determining the extent to which corporate governance influences the performance of companies. All variables used in the analysis are divided into three groups: dependent, independent and control variables. It is noteworthy to mention that their selection was based on an analysis of the academic literature and the availability of data for Kazakhstani companies.

In accordance with the research hypotheses, the following groups of variables are formed:

1. Dependent variables (DV);
2. Independent variables (IV);
3. Control variables (CV).

Table 1 below shows the operationalization of the variables.

Table 1: Variables and their measurements

Variable	Type	Operational Definition	Measurement/Scale
ROA	DV	Return on assets	Total assets
ROE	DV	Return on equity	Net profit/Equity
Tobin's Q	DV	Market valuation of the company	Market capitalization + liabilities
Board Size	IV	Size of the board of directors	Number of board members
Independent Directors Ratio	IV	Independence of the board of directors	Proportion of independent directors in the total composition of the board
Ownership Concentration	IV	Concentration of ownership	Proportion of the largest shareholder, %
Audit Committee	IV	Existence of an audit committee	Dichotomous variable
Disclosure Index	IV	Level of disclosure	Index formed on the basis of analysis of annual reports
Firm Size	CV	Size of the company	Natural logarithm of total assets
Leverage	CV	Financial leverage	Liabilities/Assets
Industry	CV	Industry affiliation	Dichotomous variables by industry category
Firm Age	CV	Age of the company	Number of years since registration

The additional inclusion of control variables in the research ensured the accuracy of the estimates, thereby minimizing the influence of external factors.

3.4 Estimation method

This study employs a comprehensive econometric approach based on panel data analysis to test the proposed hypotheses. The use of several stages of analysis within the study ensured the reliability and validity of the results obtained, as well as identifying stable relationships between corporate governance characteristics and company performance.

In the first stage of the empirical study, descriptive statistics were performed, which provided an overview of the distribution of variables, identified outliers and assessed the variability of the data. Indicators such as the mean, standard deviation, and minimum and maximum values were calculated. This stage was necessary to prepare the data for subsequent regression analysis.

Next, a correlation analysis was carried out, aimed at identifying linear relationships between the variables. At the same time, the calculation of Pearson's correlation coefficients allowed us to assess the direction and strength of the relationships.

It is necessary to point out that within the framework of this research, the key analytical method is regression analysis, which has enabled a quantitative assessment of the influence of corporate management characteristics on the performance of the organizations under consideration. The choice of this method is explained by its widespread use in empirical research, particularly in the field of corporate governance, as well as by the method's ability to identify causal relationships between dependent and independent variables based on panel data.

It is important to note that the main stage of this research is based on the development and comparison of several regression models using panel data, which allowed for the consideration of both inter-firm differences and the temporal dynamics of the indicators.

The study employs three basic approaches, namely:

The Pooled OLS model. This model involves combining all observations without taking into account the individual characteristics of the organizations under consideration. This model is the primary one and is used to obtain initial estimates of the relationships between variables.

The Fixed Effects (FE) model. Unlike the Pooled OLS model, this model allows for the consideration of individual characteristics of the organizations under study, which are not directly observed but remain constant over time. The use of fixed effects is particularly important in the context of this study, as it allows for the control of the influence of company-specific characteristics, such as corporate culture or management practices.

Random Effects (RE) model. This model assumes that individual effects are random and uncontrollable, and that they do not correlate with the explanatory variables. In this context, the Random Effects model allows for both intra-firm and inter-firm variation in the data to be taken into account.

To choose between the fixed-effects and random-effects models, the Hausman test was applied, which identifies the presence of systematic correlation between individual effects and explanatory variables.

4 ANALYSIS AND FINDING

4.1 Descriptive statistics

In accordance with the methodology outlined in the third chapter of this research, the first stage of the empirical analysis involved an examination of descriptive statistics for the selected sample of organizations. This stage was aimed at determining fundamental characteristics, such as: the distribution of variables, an assessment of their variability, and a preliminary understanding of the data structure, which were used in the subsequent regression analysis.

The sample includes organizations which represent various sectors of the Republic of Kazakhstan's economy, including: the financial sector, energy infrastructure, the extractive

industry, telecommunications, and industrial manufacturing. Such sectoral diversification ensured the representativeness of the sample and allowed for the specific features of corporate governance across different sectors of the economy to be taken into account.

The total number of observations was 344, taking into account possible data gaps for individual variables (Table 2).

Table 2: Descriptive statistics of variables

Variable	Standard	Mean deviation	Minimum	Maximum
ROA	0.072	0.065	-0.185	0.243
ROE	0.134	0.121	-0.356	0.482
Tobin's Q	1.284	0.536	0.421	2.874
BSIZE	7.8	2.1	4	13
BIND	0.342	0.158	0.000	0.714
OWNCON	0.521	0.207	0.120	0.910
AUDIT	0.744	0.437	0	1
DISC	0.631	0.142	0.320	0.890
SIZE	15.84	1.27	13.21	18.96
LEV	0.482	0.193	0.102	0.874
AGE	18.6	7.9	5	42

The analysis conducted shows that the average ROA stands at 7.2%, which directly indicates a moderate level of asset utilization efficiency among domestic companies. At the same time, there is significant variation in this metric, indicating substantial differences in efficiency between organizations. A similar situation is observed for the ROE ratio, where the average value is 13.4%; however, the range of values is quite high, including negative values, indicating the presence of loss-making companies in the sample.

Tobin's Q, which reflects the market valuation of companies, exceeds one on average, which, in turn, may indicate positive investor expectations regarding the future value of companies. Nevertheless, the high variability observed in this indicator points to heterogeneity in the market's perception of companies.

An analysis of the independent variables shows that the average size of the board of directors is around eight members, which is in line with international practice. In parallel, the average proportion of independent directors is 34.2%, which suggests a partial integration of the principles of independent oversight; nevertheless, in a number of specific organizations this figure is zero, which may indicate the presence of companies with entirely dependent boards of directors.

Ownership concentration averages 52.1%, confirming the tendency characteristic of transition economies towards a high concentration of control in the hands of major shareholders. This fact is of significant importance for interpreting the results, as it may influence the effectiveness of corporate governance mechanisms.

The variable regarding the presence of an audit committee shows that around 74.4% of organizations have such a body, indicating a relatively high level of institutionalization of internal control mechanisms. Furthermore, the disclosure index for these organizations demonstrates an

average level of transparency, suggesting that there remains scope for improving the quality of corporate disclosure.

Among the control variables, it is worth noting the significant differentiation of companies by size, as well as a moderate level of financial leverage, which reflects the characteristics of the capital structure of Kazakhstani companies. The average age of the companies is 18.6 years, indicating the presence of both relatively young and mature organizations in the sample.

Based on all the information presented above, it can be argued that the results of the descriptive statistics confirm the presence of sufficient variability in both the dependent and independent variables, which, in turn, is a necessary condition for conducting further regression analysis.

4.2 Correlation analysis

The next stage of this empirical study involves conducting a correlation analysis. This stage aimed to identify linear relationships between dependent, independent and control variables, as well as to make a preliminary assessment of the direction and strength of these relationships prior to constructing regression models.

Pearson's correlation coefficient is used to assess the relationships, as it allows the degree of linear dependence between variables to be determined. The coefficient values range from -1 to +1, where positive values indicate a direct relationship, negative values an inverse relationship, and values close to zero indicate the absence of a linear relationship.

The correlation matrix is calculated for all key variables of the study, including performance indicators (ROA, ROE, Tobin's Q), corporate governance characteristics (BSIZE, BIND, OWNCON, AUDIT, DISC), as well as control variables (SIZE, LEV, AGE).

Table 3: Correlation matrix of variables

Variable	ROA	ROE	TQ	BSIZE	BIND	OWNCON	AUDIT	DISC	SIZE	LEV	AGE
ROA	1.00										
ROE	0.72	1.00									
TQ	0.44	0.39	1.00								
BSIZE	0.11	0.1	0.16	1.000							
BIND	0.28	0.25	0.32	0.402	1.000						
OWNCON	-0.19	-0.17	-0.22	0.215	-0.312	1.000					
AUDIT	0.18	0.16	0.20	0.318	0.365	-0.284	1.000				
DISC	0.31	0.29	0.37	0.287	0.428	-0.337	0.401	1.00			

SIZE	0.21	0.20	0.27	0.441	0.356	-0.268	0.298	0.39	1.00		
LEV	-0.34	-0.42	-0.27	0.102	-0.145	0.193	-0.118	-0.21	0.32	1.00	
AGE	0.17	0.15	0.12	0.336	0.221	0.254	0.176	0.20	0.40	0.22	1.00

The results of the correlation analysis presented in the table demonstrate the existence of statistically significant relationships between the key variables of the study, which is consistent with theoretical expectations.

In particular, a positive correlation can be observed between corporate governance indicators and organizational performance. In this context, the proportion of independent directors (BIND) variable demonstrates a positive relationship with ROA, ROE and Tobin's Q, confirming the assumption that independent oversight has a positive impact on organizations' performance. A similar trend is observed for the disclosure index (DISC), which shows one of the strongest positive correlations with Tobin's Q, indicating the important role of transparency in the market valuation of companies.

In turn, the ownership concentration variable (OWNCON) shows a negative correlation with performance indicators, which may indicate potential risks associated with a high concentration of control and the restriction of minority shareholders' rights.

The board size indicator (BSIZE) has a weak positive correlation with the dependent variables, which directly points to a less clear-cut impact of this factor on company performance.

Among the control variables, it is worth noting the negative correlation between financial leverage (LEV) and performance indicators, which is consistent with theoretical expectations regarding the negative impact of high debt levels on financial results. The firm size variable (SIZE) demonstrates a moderate positive correlation with most indicators, which may indicate the presence of economies of scale.

To summarize this section of the study, it should be noted that the correlation analysis conducted confirms the observed presence of expected relationships between variables, and this also provides an empirical basis for further regression analysis. The results obtained during the analysis are consistent with the theoretical assumptions and also indicate that corporate governance characteristics can have a significant impact on the performance of companies.

4.3 Regression model results

The next key stage of the empirical study involves conducting a regression analysis, which aims to quantitatively assess the impact of corporate governance characteristics on organizational performance. It is important to note that, to ensure the reliability and comparability of the results, three types of panel data models were evaluated in turn: Pooled OLS, FE and RE.

In the first stage, the Pooled OLS model was evaluated, considered as the main specification. It should be noted that, despite its simplicity, this model does not take into account the individual

characteristics of companies. However, this model provided an initial understanding of the nature of the relationships between the variables.

Next, the FE model was applied, which allows for the control of company characteristics that remain constant over time. The results of this model are among the most important for interpretation, as they account for the heterogeneity of companies, which may influence performance.

At the same time, the RE model was evaluated, which assumes no correlation between individual effects and explanatory variables. It is significant to observe that, to choose between the FE and RE models, a Hausman test was conducted, the results of which showed statistically significant differences between the estimates, which directly supports the use of the fixed-effects model as the more appropriate one within the framework of this research.

Table 4: Results of the regression analysis (dependent variable: ROA)

Variable	Pooled OLS	Fixed Effects	Random Effects
BSIZE	0.004	0.006	0.005
BIND	0.085	0.072	0.078
OWNCON	-0.064	-0.058	-0.061
AUDIT	0.018	0.015	0.017
DISC	0.102	0.087	0.094
SIZE	0.011	0.009	0.010
LEV	-0.143	-0.128	-0.136
AGE	0.002	0.001	0.002
Constant	-0.092	-	-0.087
R^2	0.41	0.37	0.39

The results of the regression analysis presented in Table 4 demonstrate that the key corporate governance variables have a statistically significant impact on company performance.

In particular, the proportion of independent directors (BIND) demonstrates a consistently positive impact on ROA across all model specifications, which directly supports the hypothesis regarding the importance of independent oversight of management. This result is directly consistent with the theoretical tenets of the previously presented agency theory, according to which independent directors contribute to the optimization of agency costs.

The disclosure index variable (DISC) also demonstrates a statistically significant positive impact on corporate performance, which, in turn, points to the important role of the level of transparency and the quality of corporate disclosure in boosting investor confidence and improving financial results.

In parallel, ownership concentration (OWNCON) has a negative impact on ROA, which directly points to the risks associated with the dominance of major shareholders, as well as the potential infringement of minority shareholders' interests.

The financial leverage variable (LEV) demonstrates a consistently negative and statistically significant impact on performance, thereby confirming the hypothesis regarding the negative impact of high debt levels.

The board size indicator (BSIZE) and the presence of an audit committee (AUDIT) do not demonstrate a significant influence within the obtained results, which may indicate the secondary nature of these factors in the context of the domestic corporate sector.

Similar models were evaluated using the dependent variables ROE and Tobin's Q, the results of which generally confirm the previously identified patterns.

Table 5: Summary of results

Variable	ROA	ROE	Tobin's Q
BSIZE	+	+	+
BIND	+	+	+
OWNCON	-	-	-
AUDIT	+	+	+
DISC	+	+	+
SIZE	+	+	+
LEV	-	-	-
AGE	+	+	+

The analysis presented in this section demonstrates that the most significant corporate governance factors influencing organizational performance are the proportion of independent directors and the level of disclosure. The results obtained are robust to changes in the model specification and are also supported by various performance indicators.

Based on the above, it can be concluded that there is a statistically significant relationship between the quality of corporate governance and the performance of companies in the Republic of Kazakhstan.

4.4 Interpretation of results

The final stage of this empirical analysis involves interpreting the results obtained during the research in terms of aspects such as theoretical approaches, comparison with international practice, and consideration of the institutional characteristics of the Republic of Kazakhstan.

It is important to note that the previously presented results of the analysis largely confirm the key tenets of agency theory, according to which effective corporate governance mechanisms contribute to a reduction in agency costs, as well as a direct increase in the efficiency of a specific company. In particular, the positive and statistically significant impact of the proportion of independent directors on ROA and ROE may indicate that strengthening independent oversight of an organization's management does indeed improve the overall quality of decision-making and minimizes the potential for opportunistic behaviour.

Accordingly, the positive impact of the level of information disclosure confirms the thesis regarding the importance of informational transparency as a tool for reducing information asymmetry between stakeholders such as managers and investors. In turn, a higher level of disclosure contributes to increased market confidence, which is directly reflected in a rise in the Tobin's Q ratio.

In parallel with this, the above results demonstrate that not all elements of corporate governance have the expected impact. For example, the size of the board of directors and the

presence of an audit committee did not demonstrate statistical significance. This fact partially limits the universality of the agency theory under consideration within the context of the sample studied, and it also indicates that the formal existence of corporate governance institutions does not in all cases imply their effective functioning.

Summarizing all the information described, it can be concluded that agency theory is largely confirmed; nevertheless, it may require adaptation to take account of the specific institutional context.

It should also be noted that the results of this research generally align with the findings of the international academic literature. In particular, numerous studies of developed countries analyzed in this work confirm the positive impact of independent directors, as well as transparency indicators, on organizations' financial performance. The results obtained demonstrate similar relationships, which, in turn, indicates the existence of universal corporate governance mechanisms. For clarity, a table 6 has been compiled in which the results obtained in the course of this research have been compared with those from international practice.

Table 6: Comparison of research results with international practice

Factor	International studies	Results of this study
Independent directors	Positive impact on performance	Confirmed
Disclosure	Positive impact on market valuation	Confirmed
Concentration of ownership	Mixed results	Negative impact
Board size	Ambiguous results	Insignificant impact

Furthermore, it should be noted that in the Republic of Kazakhstan, corporate governance is largely formal in nature, as the presence of independent directors or committees is not always accompanied by genuine independence and effectiveness in their day-to-day activities. This fact directly explains why certain variables do not demonstrate statistical significance.

Based on the above, it can be argued that the interpretation of the presented analysis results demonstrates that the impact of corporate governance on the performance of companies in the Republic of Kazakhstan generally corresponds to theoretical expectations and international practice, yet exhibits a number of significant characteristics. In this context, the key factors are the independence of the board of directors and the overall level of disclosure, whilst formal institutional characteristics prove to be less significant.

The findings of this research highlight the emerging need for further development of corporate governance in the Republic of Kazakhstan, including: increasing the level of genuine independence of organizational management bodies, improving the overall level of transparency, and strengthening the protection of investors' rights. This aspect is of great importance both for improving the efficiency of organizations and for the development of the national stock market as a whole.

5 CONCLUSION AND RECOMMENDATIONS

The present study examined the impact of corporate governance mechanisms on the performance of companies operating in the Republic of Kazakhstan using panel data analysis for the period 2018–2025. The research was motivated by the growing importance of corporate governance in emerging economies, where institutional frameworks, investor protection systems, and market discipline mechanisms remain in the process of development. In such an environment, understanding which governance mechanisms generate measurable economic value is of both academic and practical significance.

The results obtained from this research show convincingly that governance does indeed have a substantive influence on firm performance beyond being just another regulatory aspect. The most robust and statistically significant associations were made by two mechanisms of corporate governance, namely the proportion of independent directors and the level of disclosure. Both mechanisms had a positive correlation with various indicators of financial performance such as ROA and ROE as well as Tobin's Q. It is evident that companies that exhibit high levels of independence in their corporate governance as well as disclose information tend to distribute their resources better, have higher investor confidence and thus perform more effectively.

Nonetheless, the study also revealed the fact that just because certain measures of corporate governance are in place, it does not mean that the firm will necessarily perform better. The board size and audit committee variables did not have strong statistical significance in any model used. It is thus safe to assume that a corporate body that does not perform its functions properly cannot contribute to increased firm performance.

An additional finding relates to ownership concentration, which had a negative relationship with performance measures. Even though concentrated ownership theoretically improves management and reduces managerial opportunism, it also carries certain risks, namely entrenchment, weak protection of minority shareholders, and low market confidence. The latter is especially applicable to countries with economy transition, where many businesses continue to be controlled by only a few people or structures connected with the state.

In general, the research proves the applicability of both agency theory and the principal-principal conflict concepts for corporate governance studies in Kazakhstan. On the other hand, the results also reveal that any governance approaches work under specific institutions, including concentrated ownership and developing regulations. Therefore, international corporate governance standards need to be adjusted to local conditions rather than introduced on paper.

Academically, this research adds value to the scarce amount of empirical research conducted into the field of corporate governance in the Republic of Kazakhstan by utilizing panel data analysis techniques and studying several corporate governance indicators at the same time. Practically, the findings show that better corporate governance will be beneficial for creating competitive advantage, attracting investments, and development of the Kazakhstan stock market in general.

5.2 Recommendations

Based on the empirical findings of this study, the following recommendations are proposed for corporate managers, boards of directors, investors, and policymakers in the Republic of Kazakhstan.

Recommendations for Companies

Companies should strengthen the real independence and professional capacity of boards of directors. It is not sufficient to appoint independent directors solely to satisfy regulatory expectations. Firms should ensure that independent board members possess relevant industry

expertise, financial literacy, strategic competence, and the authority necessary to challenge management decisions where required. Moreover, organizations should improve the quality and depth of corporate disclosure. This includes timely publication of annual reports, clear communication of ownership structures, transparent reporting of governance practices, and broader disclosure of strategic and non-financial information.

Recommendations for Regulators and Policymakers

Instead of having only formal regulations on corporate governance, regulatory bodies must work even harder to enforce corporate governance standards that are being applied in a concerted way by all parties. For example, they should work to ensure that monitoring and controlling mechanisms, as well as disclosure verifications, and penalties for material non-compliance, are all being used in a consistent manner. Policymakers must continue to expand the protections for minority shareholders' interests. This is particularly important because of the damaging effects of concentrated ownership highlighted in this study—improving minority interests will improve fairness and provide confidence to the market.

Recommendations for Investors and Market Participants

Investors should incorporate governance indicators into their investment analysis and valuation models. Variables such as board independence, transparency, and ownership structure can serve as meaningful predictors of firm quality and long-term sustainability.

Recommendations for Future Research

Future research on this topic could lead to many other conclusions, including, for example: using larger number of companies over longer periods of time helps to generalize the findings; examining the influence of the corporate governance mechanisms of particular sectors (e.g., banks, extractive industries, state-owned enterprises) can also yield useful information; and using qualitative approaches (e.g., interviews with board members, regulatory agencies, and investors) will help researchers understand the reasons for the lack of effectiveness of some formal governance mechanisms.

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THE IMPACT OF IFRS ADOPTION ON ECONOMIC GROWTH: A CROSS-COUNTRY ANALYSIS

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Abstract

This article analyzes the impact of IFRS adoption on economic growth. The study is based on a dataset from the World Bank covering a 25-year period from 2000 to 2024. The dataset includes more than 50 countries from all continents. The analysis uses panel data and applies the Feasible Generalized Least Squares (FGLS) model.

Before running the regression, several diagnostic tests were conducted, including tests for stationarity, multicollinearity, autocorrelation, and heteroskedasticity. The Hadri LM and Fisher-type tests are used to check stationarity. The Variance Inflation Factor (VIF), Wooldridge test, and likelihood-ratio test are used to detect multicollinearity, autocorrelation, and heteroskedasticity, respectively.

The study provides several key findings. The main variable, IFRS adoption, has a negative diminishing effect on GDP growth, meaning that each additional year after adoption has a smaller impact on a country's GDP level. Macroeconomic variables have a stronger effect: foreign direct investment (FDI) and population growth have a positive impact, while unemployment, inflation, and domestic credit have a negative impact on GDP. Among institutional variables, the Rule of Law is the only one with a significant positive effect on economic growth.

The results provide useful insights for researchers and policymakers about the advantages and limitations of IFRS adoption in relation to economic growth. While IFRS adoption has a noticeable short-term effect, macroeconomic and institutional factors play a more important role.

Keywords: IFRS, economic growth, transparency, Feasible Generalized Least Squares (FGLS), GDP, FDI.

1. Introduction

In modern economic world, there are more close connections between countries. These connections are made through investment, trade, financial interactions and exchange of labor. Close economic interaction between states leads to world economy to function as a unique single system, because they are quite interdependent on each other. Within this context, the International Financial Reporting Standards (IFRS) is the part of global economic integration. The IFRS principles are aimed to enhance the transparency and comparability of financial information across countries. Such transparency, firstly, is a source of reliable data for firms, investors, and governments. Secondly, IFRS transparency contributes to lower financing costs, which increases stock market liquidity. Moreover, IFRS may also reduce the opportunities for corruption and financial manipulation, because IFRS adoption strengthens capital markets and contributes to a more resilient financial system. Given these potential benefits, there is a question how IFRS adoption affects the economic development in different countries. In 2005, the European Union obliged all countries inside the union to adopt the IFRS, which was first huge significant step in IFRS globalization. Today, IFRS is either partly or fully adopted in more than 100 countries around the globe. IFRS core objectives, which are comparability, transparency, accountability, and global consistency, not only helps stakeholders evaluate corporate performance, but also facilitates capital markets by lowering cross-border investment costs.

Adoption paths, however, might be different. Developed economies such as the EU and Australia have fully adopted IFRS, emerging markets like China and India follow a convergence approach, and the United States continues to use US GAAP while allowing foreign issuers to report under IFRS. Recognizing these differences is critical for cross-country analysis, which this study undertakes in the following sections. Most existing studies on IFRS focus on single-country analyses, such as case studies of the United Kingdom, Germany, or China. These studies typically examine micro-level indicators—including accounting quality, earnings management, or stock-price reactions—and often emphasize short-term market outcomes such as price volatility and changes in investor information asymmetry.

However, this stream of research largely overlooks the macroeconomic dimension, including economic growth rates, cross-border capital flows, long-term investment efficiency, and the broader stability of financial systems. Because cross-country comparisons remain limited, it is difficult to assess how differences in legal and institutional settings shape the economic effects of IFRS adoption.

Therefore, there is a clear need for multi-country, comprehensive analyses that evaluate the impact of IFRS adoption on both economic growth and capital-market stability, providing evidence to guide global economic integration and to help policymakers better understand the full implications of IFRS.

2. Literature Review

2.1 Developed Countries

Several studies have examined the relationship between IFRS adoption and economic growth in developed countries. Oppong and Aga (2019), conducted research that analyzed the impact of IFRS adoption on countries, included in European Union (EU). The research was done based on 28 countries, focusing on direct influence of IFRS adoption on economic indicators during 10-year period (2005-2014). Authors used panel data as empirical model for their research, additionally including country-specific control variables. The results showed that IFRS adoption has a significant positive impact on economic growth. However, authors specified that there is more positive impact on developing countries, whereas developed countries experience a positive, but diminishing effect on economic growth.

Morshed (2024) conducted similar research, but in different settings. The author chose another relatively developed region as base for research, which is Arabian Gulf region. Most of Arab countries across the gulf are relatively developed due to high oil production. The research analyzes the impact of IFRS introduction on economic growth of Arabian Gulf countries. It focuses on 6 countries (Saudi Arabia, Qatar, the UAE, Bahrain, Oman and Kuwait) for the period between 2010-2020. The research utilizes panel data regression, using fixed and random effect models as well. Morshed (2024) summarizes the positive relationship between IFRS adoption and key economic indicators, such as FDI and GDP.

2.2 Developing Countries

Owusu et.al. (2022) conducted in-depth research on whether the adoption of IFRS affects economic growth in developing countries, based on the quality of national institutions. They used panel data as a model for research. Additionally, authors used an efficient two-step generalized method of moments (GMM) estimation. The database of research consists from 78 developing countries between 1996 and 2013, averaged over three non-overlapping years. They concluded that countries that adopted IFRS did indeed experience better economic growth than those that did

not. They also found that strong institutions moderated the relationship between IFRS and national economic growth.

There was another research which examined whether the pandemic-induced economic crisis significantly impacted the relationship between mandatory IFRS adoption and economic growth in developing countries. Ugwu and Okoye (2018) examined macroeconomic indicators of mandatory IFRS adoption, such as economic growth, given the scarcity of information available today. They also examined the impact of mandatory IFRS adoption on economic growth before and during the pandemic to better understand the temporal relationship during the crisis.

The research model is a panel data, which is quite popular choice among scholars in empirical research. The model also included generalized least squares (EGLS/weighted cross-section) and fixed-effects methods. The data is collected from 30 developing countries, including 15 Middle Eastern and North African countries and 15 sub-Saharan countries. Period of observations for this research spans from 2017 to 2020. The study concluded that mandatory IFRS adoption had a positive impact on economic growth, but this effect was attenuated during the pandemic. This study provides valuable insights for policymakers and regulators in developing countries, especially during economic crises.

Another research, which is intended to analyze the relationship between IFRS and economic performance, was conducted in the CIS region. Elhamma (2023) investigates the economic growth patterns of 11 post-Soviet countries following their adoption of International Financial Reporting Standards (IFRS). Research uses observations for the period between 2005 and 2018. To ascertain the specific effects of the variables under consideration, the regression model is bifurcated into two sub-models based on variable categorization. The study reveals a huge difference in economic growth between countries that have adopted IFRS and those that have not. A negative, although statistically insignificant, correlation between IFRS adoption and GDP per capita was observed. The findings for the CIS region are similar to Eastern European countries, which is beneficial to identify common trends and inform policy recommendations. Furthermore, the article provides insights into policy implementation within Uzbekistan, which follows similar tendency with Kazakhstani economy.

Despite the widespread adoption of IFRS as a universal accounting standard, research focusing on transitional economies within particular geographic regions remains limited. Data collection for IFRS adoption presented challenges, as the number of observations following full IFRS implementation was notably reduced, necessitating the application of advanced econometric models.

2.3. Theoretical framework

This research, which examines the impact of IFRS adoption on economic growth, cannot be independent from established theories. Current research is closely connected to several theoretical approaches, which are quite popular among scholars in the spheres of finance and economics. These theories include Institutional Theory, Agency Theory, Efficient Market Thery and Theory of New Institutional Economy.

Institutional Theory is the notion which view institutional pressure as a main reason for decision-making on any organizational or state level. This theory was firstly introduced into broad scholar world by Maggio and Powell in 1983. DiMaggio and Powell (1983) introduce three types of institutional pressures: coercive, normative and mimetic. Coercive corresponds to laws or other international organizations, whereas normative pressure reflects to professional norms. Mimetic pressure includes copying successful models, which obliges to do that in order to be on the right side.

As it can be seen, IFRS adoption corresponds to all three institutional pressures, introduced by Maggio and Powell. IFRS were introduced by International Accounting Standards Boards (IASB), international financial organization with high influence. Even with the influence of the IASB, IFRS is also considered as a professional norm. Most accountants strictly follow the IFRS because it is considered as ethical and highly valued among fellows. Lastly, developing countries have been adopting the IFRS, because there are examples of success in developed countries.

Institutional Theory also provides great connection between variables. IFRS dummy variable, which is the year IFRS was introduced in particular country, would have effect on GDP or FDI through institutional variables. Institutional variables such as Rule of Law and Regulatory Quality, would be a clear reflection of Institutional

Institutional Economy theory is relatively a new wave in understanding economic development. This theory became quite popular in the end of 20th century, after the research done by Douglas North in 1990. North (1990) identifies the role of institutions as a key driver of economic growth. States with high institutional quality, which is viewed from the enforcement of laws and norms, contributes to long-run economic growth, through reduction of transaction costs.

IFRS adoption is also a driver of economic growth through **New Institutional Economy theory**. IFRS is formally considered as an international law of standards for most of countries. Moreover, IFRS reduces transaction costs, because it reduces uncertainty and information cost due to universal standards among all countries which operate under IFRS. Thus, IFRS is a clear representation of Institutional Economy, where efficient laws ensure economic development.

New Institutional Economy Theory provides perfect inter-variable relationship between IFRS adoption and economic growth. As in Institutional Theory, dummy variable for IFRS adoption is an independent variable, whereas GDP or FDI inflows is a dependent variable, which captures economic growth.

Agency theory focuses on inequality of information between two group of people, principals and agents. Agency theory was introduced by Jensen and Meckling in 1976. According to them, there is an information asymmetry between principals (investors and citizens) and agents (management and government). Jensen and Meckling (1976) suggest that agents possess much more information in comparison to principals. Managers which are closely connected to political government, might utilize this information gap for their own financial or political benefit.

IFRS adoption, on the other hand, is perfectly fit into agency theory. IFRS made possible for avoiding information gap between principals and agents by promoting transparency. Transparency is one of the key principals introduced by IFRS, which limits big corporations or stock market governors to manipulate information for their benefit. Investors and citizens, due to IFRS, are free to monitor all financial statements of public companies, which erases their informational gap to agents.

Efficient market theory, developed by Eugene Fama in 1970, reflects the importance of available information on capital markets. According to Fama (1970), reporting quality and transparency of information leads to more efficient capital markets. Investors and government have a higher confidence to invest in projects, which are reported in a right way.

IFRS adoption sticks perfect to Efficient Market Theory. The IFRS are intended to increase transparency among institutions and companies in their reporting of financial statements. Moreover, IFRS ensures that all accounting reports are done in universally applicable standard, which is not only for developing countries, but for more advanced nations. By enhancing both transparency and high reporting quality, IFRS clearly illustrates Efficient market theory.

3. Data

The purpose of the research is to study the effect of IFRS adoption on economic and financial development of the particular state. This research paper examines a country-level analysis. The research focuses on 50 different countries across 6 continents for 25-year period, between 2000 and 2024.

The study aimed to perform unbiased sample selection in order to conduct as accurate research as possible. The dataset included not only developed countries from Europe and North America, but also developing countries from Latin America, Asia and most importantly, Africa. Another criterion for country to be included in the dataset was data availability. Some countries, such as North Korea, most of Sub-Saharan and Micronesian countries contain limited data that is needed for research, which was the reason why they were excluded from dataset

3.1. Methodology

The regression includes one dependent variable for model, eleven independent variables, and year-fixed effects. The model uses GDP percentage growth as a main independent variable, to analyze the pure economic effect of IFRS adoption throughout 21st century. The model utilizes a set of independent variables, which can be divided into three groups: institutional, macroeconomic and IFRS variables:

- Institutional variables (IV) include three key indicators that capture institutional quality: Rule of Law, Regulatory Quality, and Government Effectiveness.
- Economic variables (EV) cover macroeconomic factors that may affect financial market performance and include foreign direct investment (as % of GDP), domestic credit to private sector (as % of GDP), inflation rate, economic growth, trade openness, population growth and unemployment rate.
- IFRS variable which is the number of years since IFRS adopted in particular country. It is intended to capture long-term effect of IFRS adoption on GDP.

In addition to the dependent and independent variables, the regression model incorporates year-fixed effects intended to control for major global events that may significantly impact financial market stability. There were 2 major events that have huge effect on GDP, which are global financial crisis and global pandemic

Our regression model looks as following:

$$\mathbf{GDP} = \beta_0 + \beta_{1\text{-}3}(IV) + \beta_{4\text{-}9}(EV) + \beta_{10}IFRS + \text{year fixed variables} + \varepsilon$$

Y = Foreign Direct Investment (as % of GDP)
β_0 = constant parameter
$\beta_{1\text{-}3}$ = model coefficient parameters for Institutional Variables
$\beta_{4\text{-}9}$ = model coefficient parameters for Economic Variables
β_{10} = model coefficient parameter for IFRS dummy variable
ε = residual term

4. Empirical analysis results

Before moving to regression analysis, it is essential to conduct pre-regression tests. This study implements 4 main pre-regression tests, which are stationarity, multicollinearity, heteroskedasticity and autocorrelation tests.

Table 1. Test for stationarity

Variable Name	Unit-root test	p-value	Stationarity
GDP	Fisher-type	0.0000	Variable is stationary (p-value is less than 1%)
Inflation	Fisher-type	0.0000	Variable is stationary (p-value is less than 1%)
Unemployment	Fisher-type	0.0000	Variable is stationary (p-value is less than 1%)
FDI	Fisher-type	0.0000	Variable is stationary (p-value is less than 1%)
Population Growth	Hadri LM	0.0000	Variable is stationary (p-value is less than 1%)
Trade Openness	Fisher-type	0.0042	Variable is stationary (p-value is less than 1%)
Rule of Law	Hadri LM	0.0000	Variable is stationary (p-value is less than 1%)
Regulatory Quality	Hadri LM	0.0000	Variable is stationary (p-value is less than 1%)
Government Effectiveness	Hadri LM	0.0000	Variable is stationary (p-value is less than 1%)
IFRS	Hadri LM	0.0000	Variable is stationary (p-value is less than 1%)

First step, which is conducted even before choosing variables for the research is stationary test. Stationarity test indicates that mean and variance of variable does not change over time. Stationarity is the most common assumption in statistics, which implies that variables that are non-stationary cannot even be included in the research.

There are various stationarity tests that are implemented by various scholars. Current research utilizes two types of stationarity tests, which particularly are Fisher-type and Hadri LM stationarity tests. As it can be seen from stationarity tests (Table 1), all variables, either dependent or independent, are stationary, with their p-values less than 1% level of significance.

Next step, which is done after stationarity test, is multicollinearity test. Multicollinearity is a serious threat to unbiasedness of the model, because high collinearity between variables leads to incorrect results. Multicollinearity is tested by Variance Inflationary Factor (VIF) method.

Table 2. Multicollinearity test

Variable	VIF	1/VIF
Government Effectiveness	17.72	0.056442
Rule of Law	15.22	0.065702
Regulatory Quality	10.59	0.094423
Domestic Credit	2.05	0.488684
Trade Openness	1.55	0.644282
Population Growth	1.16	0.860182
Inflation	1.13	0.882346
FDI	1.11	0.904742
IFRS	1.03	0.967913
Unemployment	1.02	0.980006
Mean VIF	**5.26**	

Next step, which is done after stationarity test, is multicollinearity test. Multicollinearity is a serious threat to unbiasedness of the model, because high collinearity between variables leads to incorrect results. Multicollinearity is tested by Variance Inflationary Factor (VIF) method.

As it can be seen from Table 2, mean VIF for the model is equal to 5.26, which indicates there is no multicollinearity in the regression model. Scholars indicate that VIF values between 0 and 10 is quite acceptable for the correctness of research, despite some scholars suggest that mean VIF should be even less than 5.

Table 3. Autocorrelation test

Wooldridge test for Autocorrelation in panel data
H_0: no first-order autocorrelation
F (1, 49) = 10.602
Prob > F = 0.0021

Next step during pre-regression tests is testing the regression for autocorrelation. Wooldridge test for autocorrelation is the most common tool, which is used to identify particular econometrics issue. There is no autocorrelation, if p-value is greater than 1%/5%/10% significance level. As it can be seen from Table 3, p-value is less than 1% significance level, which is the sign of the presence of autocorrelation in the model.

Table 4. Heteroskedasticity test

lrtest hetero homo, df (975)	
Likelihood-ratio test	LR chi2(975) = 267.91
(Assumption: hetero nested in homo)	Prob > chi2 = **1.000**

Heteroskedasticity test is the last step of pre-regression tests chain. Heteroskedasticity

indicates that variance of errors in observations is not constant. Table 4 shows the result of heteroskedasticity test. According to it, p-value is equal to 1.0000 which is greater than 10% significance level. It implies there is no heteroskedasticity present in the model.

After conducting all pre-regression tests, there is a detected autocorrelation in the model. Presence of autocorrelation removes using such as, random and fixed effect models. In order to control this issue, the study utilizes FGLS panel data model, because number of periods are higher than number of observations.

Table 5. FGLS regression

GDP	Coef.	Std. err	z	P>[z]	95% confidence interval	
FDI	0.0295639	0.0112034	2.64	0.008	0.0076058	0.0515221
Domestic Credit to Private Sector (as % of GDP)	-0.0037743	0.002063	-1.83	0.067	-0.0078176	0.0002691
Inflation	-0.0229796	0.0137093	-1.68	0.094	-0.0498493	0.0038901
Unemployment	-0.0859781	0.0138322	-6.22	0.000	-0.1130887	-0.0588676
Population Growth	0.2787574	0.0983051	2.84	0.005	0.086083	0.4714318
Trade Openness	-0.1219717	1.45402	-0.08	0.933	-2.971799	2.727856
Government Effectiveness	-0.3153636	0.4037134	-0.78	0.435	-1.106627	0.4759002
RegulatoryQuality	0.3914291	0.3101002	1.26	0.207	-0.2163561	0.9992142
Rule of Law	-0.9713747	0.3630494	-2.68	0.007	-1.682938	-0.2598109
IFRS	-0.0693366	0.0136336	-5.09	0.000	-0.096058	-0.0426152
Year 2007	0.3855061	0.3005966	1.28	0.200	0.2036524	-0.9746646
Year 2008	-1.153032	0.3137826	-3.67	0.000	-1.768035	-0.5380295
Year 2009	-4.602085	0.2996286	-15.4	0.000	-5.189347	-4.014824
Year 2020	-5.970685	0.2634745	-22.7	0.000	-6.487085	-5.454284
Year 2021	2.433844	0.266056	9.15	0.000	1.912383	2.955304
_cons	5.001873	0.2845851	17.58	0.000	4.444096	5.55965

Table 5 shows the final result of regression model, which analyzes the effect of IFRS and other independent variables on GDP growth. The model has R-squared equal to 0.3239, which means 32% changes in GDP are explained by this regression.

Main focus of our research, IFRS adoption has a significant impact on GDP, since p-value is less than 1% significance level. Surprisingly, the model shows the negative impact of IFRS adoption on macroeconomic performance of a state. 1 additional year of IFRS adoption leads to 0.06% percentage point decrease in GDP growth. Despite little negative effect of IFRS adoption

on GDP growth, even such tiny adverse effect contradicts previous research and common logic.

Such shocking result might be explained by the fact that other macroeconomic variables have more substantial impact on GDP than IFRS adoption. All macroeconomic variables, other than Trade Openness, have a significant impact on GDP. FDI and population growth have a positive effect, whereas unemployment, inflation and domestic credit have a negative impact on GDP, which fully goes along with common theory.

Rule of Law is the only institutional variable, who had a significant impact on GDP in this research, which is also shockingly negative. Under ceteris paribus, 1% increase in Rule of Law indicator leads to 0.97% decrease in GDP growth. This might be also connected with higher impact from macroeconomic variables rather than Rule of Law.

Model also reports the significant impact of Global Financial Crisis and Covid-19, clearly indicating that crises peak points were detrimental to economic growth. Pre-financial crisis (2007) and post-COVID year (2021) had a positive impact on GDP, whereas years 2008, 2009 and 2020 were negatively affecting GDP growth.

5. Conclusion

Current research analyzes the impact of IFRS adoption on economic performance on country level. The study examines the effect of IFRS on state economic performance for 25-year period (2020-24) and takes the sample size of 50 countries over all continents. The study utilizes FGLS panel data model.

The research provides unexpected results, contradicting existing scientific literature on this particular topic. The regression model provided that IFRS adoption has a significant negative effect on GDP growth, despite all other scholars stating otherwise. It might be connected with greater effect that come from economic variables and external factors, such as Global Financial Crisis and COVID-19 pandemic.

This research suggests future studies to include more independent variables in order to diminish the effect of economic variables on GDP, which might provide more realistic insight on the relationship between IFRS adoption and economic growth. Another suggestion would be find more effective measure of IFRS variable, apart from number of years since IFRS was adopted, but it might require additional resources.

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Towards a Sustainable Future: Examining Determinants of Renewable Energy Sector in Central Asia

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ABSTRACT

This research paper studied the effects of various economic and quasi-economic factors on the renewable energy consumption in Central Asian countries. Having data collected from the World Development Indicators database of the World Bank Group DataBank and Global Innovation Index reports of the World Intellectual Property Organization figures on Kazakhstan, Uzbekistan, Kyrgyzstan, Tajikistan, and Turkmenistan in the period of 2011-2023 were analysed. REC was chosen as a dependent variable while electricity production from natural gas sources, access to electricity, gross domestic product (per capita), global innovation index score, and foreign direct investment were used as independent variables. The FGLS model was used to conduct the regression analysis and identify impacts of independent variables on renewable energy consumption. The results of the study showed that electricity production from natural gas sources, access to electricity, and gross domestic product have significant and favourable impact on renewable energy consumption in Central Asia. On the other hands, the findings imply that global innovation index score, and foreign direct investment have a considerable negative impact on renewable energy consumption. The study provides certain findings, conclusions, and recommendations that may be useful to policymakers, investors in renewable capacities, and researchers in Central Asian countries and worldwide.

KEYWORDS: Renewable energy consumption; Central Asia; Natural gas; Access to electricity; GDP; Global Innovation Index; Foreign direct investment; FGLS

1 INTRODUCTION

In the XXI century the issues of climate change, energy efficiency, and natural resources depletion become one of the most topical and discussed both in academia and practical fields. One of key measures that was developed to address all the challenged mentioned above at once is renewable energy production which is a process of electricity generation from natural sources that are replenished faster than used (e.g. wind, hydropower, solar, biomass, and geothermal energy). In this regard, states-initiated policies on the adoption and expansion of renewable energy in economies.

An example of such policies is implementation of nationally determined contributions submitted by states within the framework of international obligations performance under Paris Agreement of 2015. The implementation focuses on the reduction of electricity production from coal, oil, and gas must be substituted by the increased capacities of renewable energy. The policies create a solid ground for the renewable energy development in the economic domain. Thus, the investment in clean energy sector in 2022 amounted to USD 1, 617 billion comparing to USD 1, 002 billion investments in fossil fuels, while the difference in investments was predicted to

increase in 2023 as capital input in alternative energy should have reached USD 1, 740 billion (IEA, 2024).

However, in order to ensure reaching Paris Agreement goals states reflect on the efficiency of policies implemented in the past and to be implemented in the future. Consequently, the studies on driving factors of renewable energy become very topical. Thus, the goal of this research is to identify the factors affecting renewable energy consumption in countries of Central Asia. In particular, the study employs such macroeconomic variables as access to electricity, gross domestic product, global innovation index score, and foreign direct investment. Moreover, the study's specific is that it foe the first time proposes to measure the impact of electricity production from natural gas sources on the renewable energy consumption. The data was collected for 5 Central Asian states, specifically Kazakhstan, Uzbekistan, Kyrgyzstan, Tajikistan, and Turkmenistan for the time frame from 2011 to 2023 due to data availability concerns

The study's structure consists of the following sections: The first part describes previous studies conducted on measuring renewable energy driving factors, then the methodology and data part is presented with relevant hypothesizes mentioning following, the next section aims to present the research results and interpretations thereof ending with conclusions, recommendations and limitations in the last part of the paper.

2 LITERATURE REVIEW

There is a considerable number of articles that addressed the development of renewable energy worldwide from the financial perspective. Such an interest is founded upon the rapid renewable energy development in the XXI century. That is, in 2023 the total electricity produced by renewable energy sources constituted 507 GW, which is 50% higher than a number of 2022, specifically around 250 GW (IEA, 2024). The growth itself has a profound underlying basis, the renewables promotion as a part of "race" for green sustainable development occurred and is currently accelerating due to advantages that renewables bring to states. Those edges for Central Asia among other things include (i) diversification of the energy sector by abandoning use of fossil fuels, (ii) grid system security development necessity in the framework of expanding energy demands, as well as (iii) environmental issues handling (Shadrina, 2020; Laldjebaev et al., 2021; Gubaidullina et al., 2017).

Previous studies have conducted examination of factors influencing renewable energy consumption in both developed and developing countries. Prior research studies suggest that the type of impact and its magnitude are absolutely different and renewables development influencers applicable in developed countries may not fit the conjuncture of developing states (Hunt et al., 2024; Camacho et al., 2022). In this regard a more meticulous study of renewable energy drivers in developing countries should be conducted. Moreover, a more systematic and holistic analysis should be conducted of each particular region (Latin America, Africa, Middle East, Central Asia) due to economic, social, and political specifics that it may have.

Even though certain studies have been conducted in Central Asia on the topic of renewables development and their importance for the regions by recognising its vast potential for expansion and emphasising the benefits of such development, these papers do not address the issue of driving factors in terms of quantitative analysis via application of the econometric model to the data collected in the target area (Laldjebaev et al., 2021; Kaliakparova et al., 2020). In such a context to study the key drivers of the renewable energy development in Kazakhstan, Uzbekistan, Kyrgyzstan, Tajikistan, and Turkmenistan, the example of studies in other regions should be taken into account.

Hunt et al.(2024), following the example of Bourcet, analysed 41 research papers on the drivers of renewable energy growth in developed and developing countries which were published between 2016 and 2024 making it 89 papers in total. The summary of the papers was presented in the form of a table which outlined the difference in the variables presented in the econometric models, research methods applied, as well as the results derived from the research. The paper of Hunt et al. pursued the goal of examining 14 drivers of renewable energy advancement, specifically gross domestic product, crude oil price, CO2 emissions, trade, access to electricity, surface, Methane emissions, foreign direct investment, government expenditure in education, research and development expenditure, patent applications, total natural resources rents, urban population, and economic development (Hunt et al., 2024). Additionally, renewables as a share of total energy consumption and renewables as a share of total electricity supply were taken as dependent variables to measure the renewable energy development. The researcher used the "fixed effect model with country and year effects corrected for heteroscedasticity". The results of the study showed that policymakers should focus on GDP, openness to trade, and electricity accessibility improvement in order to increase the share of renewables in electricity consumption (Hunt et al., 2024).

Another paper focused on the study of renewables development in 85 countries divided into four groups based on the type of a political regime, which are full democracy, flawed democracy, hybrid, and authoritarian regime. The researcher used such independent variables as innovativeness, regulatory quality, the interaction of innovativeness with regulatory quality, trade openness, tax attractiveness, interaction of trade openness with tax attractiveness, financial liberalization, per capita GDP, political stability, and inflation. Authors conclude that to promote renewable energy development, the government should focus on free trade and favourable tax regimes promotion (Yahya et al., 2019).

A different article to be mentioned is one on the examination of renewable energy consumption share in the European Union. The gross domestic product, foreign direct investment, trade openness, education index, life expectancy index, and the governance index. By using panel-corrected standard error estimation model, authors the results were as follows: education and life expectancy has a positive impact on the renewables advancement. Additionally, energy poverty should be tackled while the foreign direct investment should be increase for the qualitative growth in renewable energy consumption to occur (Camacho et al., 2022).

Therefore, this paper employs quantitative analysis as its base due to and sets identification of the key renewable energy consumption (% of total final energy consumption) drivers for Central Asia thus filling the literature gap and laying the basis for future research. Quantitative analysis was chosen due to the fact that it provides valuable insights into the factual fundamentals of the issue and mitigates subjective biases (Savela, 2017).

Table 1 – Relevant Studies Literature Review

Author(s)	Countries	Period	Methodology	Variables	Results
Hunt et al. (2024)	177 countries	1990 to 2020	Ordinary Least Squares, Base Model unbalanced panel, heteroscedastic-consistent standard errors, Pooled Model, a fixed effects model with country fixed effects, a fixed effects model with country and time fixed effects, and a random effects model	Dependent: renewables as a share of total energy consumption and renewables as a share of total electricity supply; Independent: gross domestic product, crude oil price, CO2 emissions, trade, access to electricity, surface, Methane emissions, foreign direct investment, government expenditure in education, research and development expenditure, patent applications, total natural resources rents, urban population, and economic development	The government should focus on policies that encourage free trade, overall economic growth and population's access to electricity to achieve renewable energy development in a country.
Yahya et al. (2019)	85 countries divided into four groups based on regime types (full democracy, flawed democracy, hybrid, and authoritarian regime	2007 to 2014	Panel unit root test, system-GMM technique, Im–Pesaran–Shin test	Dependent: Renewable energy consumption; Independent: innovativeness, regulatory quality, the interaction of innovativeness with regulatory quality, trade openness, tax attractiveness, interaction of trade openness with tax attractiveness, financial liberalization, per capita GDP, political stability, and inflation	Policy makers should dedicate attention to improvement of trade openness and tax attractiveness in order to facilitate renewable energy consumption figures.
Camacho Ballesta, J.A. et al. (2022)	176 countries worldwide and 28 EU countries	2001 to 2015	Principal Component Analysis, Ordinary Least Squares (OLS), Feasible Generalized	Dependent: Renewable energy consumption; Independent: gross domestic product, foreign direct investment, trade	The legislators should devote their attention to social educational policies that promote knowledge gaining on environmental issues

			Least Square (FGLS) and Panel Corrected Standard Error (PCSE)	openness, education index, life expectancy index, and the governance index	and energy use system alteration.
Agyeman, et al. (2022)	China, US, India, Russia Federation, and Japan	1990 to 2015	Panel unit root test, Panel cointegration test, Decomposition analysis, Bi-directional long short-term memory (Bi-LSTM) sequential algorithm method	Dependent: Renewable energy consumption; Independent: gross domestic product, population growth, trade as a percentage of GDP	The results indicate that free trade and economic growth positively affect renewables development while population growth has a considerable negative but non-immediate impact.
Damette et al. (2019)	24 European	1990 to 2012	Panel unit root testing, Cointegration testing, Fully Modified Least Squares (FMOLS) estimator, Dynamic Ordinary Least Squares (DOLS) estimator, PMG (Pooled Mean Group) estimator	Dependent: renewables energy production; Independent: CO2 Emissions, Real GDP income, Energy Use, Dependency, Oil Price	The key driver of renewable energy production in EU is the real GDP income that creates a basis for business to invest in renewable energy facilities.

Lupu et al. (2023)	Western European (Austria, Belgium, Cyprus, Denmark, France, Finland, Germany, Greece, Ireland, Italy, Luxembourg, Malta, Netherlands, Portugal, Spain, Sweden, and the United Kingdom), and Central and Eastern European, (Bulgaria, Czech Republic, Croatia, Estonia, Latvia, Lithuania, Hungary, Poland, Romania, Slovenia, Slovakia)	2004 to 2020	Pooled Ordinary Least Squares (OLS), Fixed Effects (FE), and Random Effects (RE) models	Dependent: renewables energy consumption; Independent: Energy-related tax revenue, % total environmental tax Revenue, Government budget allocations for R&D, environment, Government budget allocations for R&D, energy, Renewable energy public RD&D budget, % total energy public RD&D, Real GDP per person, Energy productivity, Energy intensity, Energy efficiency, primary energy consumption (Europe 2020-2030), Energy efficiency, final energy consumption (Europe 2020-2030), Energy imports dependency	Government budget allocations for research and development, energy are the key driving factors of renewable energy consumption on which the policy makers in European countries should concentrate
Mehmood et al. (2022)	BRICS (Brazil, Russia, China, and South Africa)	1988 to 2017	Panel quantile regression model, Hausman test, fixed-effect model, non-additive fixed effect panel quantile approach	All variables are transformed into logarithmic form, d the panel Pooled Mean Group (PMG) method used, an error-correction model applied Dependent: renewable energy (Terawatt hours); Independent: income inequality, GDP, trade openness, corruption, CO2 emissions	CO2 emissions should be decreased while trade and the use of renewable energy resources should be advanced in order to promote renewable energy development.

Belaïd et al. (2023)	9 MENA countries, namely, Algeria, Egypt, Iran, Iraq, Jordan, Lebanon, Morocco, Tunisia, and Yemen	1984 to 2014		Dependent: renewable energy production; Independent: Political Stability and Absence of Violence index, Governance quality index, Domestic credit to the private sector, Gross Domestic Product, Total natural resources rents, CO2 emissions, foreign investment, Total factor productivity, Trade openness, Total energy consumption	The renewable energy production to a large extend depends on political stability, government effectiveness and efficiency as well as on financial development.
Nyiwul et al. (2023)	50 Sub-Sahara African countries	1980 to 2011	Dynamic ordinary least squares (DOLS), fully modified ordinary least squares (FMOLS), and fixed effects (FE) methods	Dependent: renewable energy consumption; Independent: Size of income, represented by real GDP, population size, quantity of carbon dioxide emissions, share of industrial sector, and real price of oil.	Share of industrial sector and population growth show the most significant effect on the renewable energy promotion in the SSA region.

2.1 Ecological Modernization Theory

The ecological modernization theory was first developed by Joseph Huber (1982) who asserted that the industrial society should focus on technological advancement in order to find a balance and productive interaction between economy and ecology. The theory was transformed later by other scholars but its core essence remains the same, which is the increase in business efficiency by the adoption of new eco-friendly technological advancements.

Contemporary understanding of the theory is well described by Gibbs (2017), who asserted that ecological modernization theory proposes that policy makers and market participants should cooperate to aspire for the environment protection. Such cooperation should be manifested in political, economic, and technological frameworks. As a result, the saving of environment may be achieved without reduction of economic development, thus achieving a "win-win" situation.

3 VARIABLES PRESENTATION

3.1 Dependent Variable

In accordance with the relevant literature and theory presented above the renewable energy consumption was chosen as a dependent variable as it more precisely addresses the issue of a

country's sustainable development and reduction of energy produced from fossil fuels (Yahya et al., 2019).

3.2 Independent variables

3.2.1 Electricity production from natural gas sources (% of total)

This variable replaces crude oil price and CO2 emissions in certain studies covered in literature review section as not all Central Asian countries have considerable oil reserves but have substantial reserves in and production of natural gas (UNECE, 2020; Hu, 2014).

3.2.2 Access to Electricity (% of population)

The variable is adopted from Hunt's research. Taking into account that access to electricity reflects the baseline energy demand among the population, the high demand may ensue even more rapid transition to renewable energy in countries that highly rely on fossil fuels as renewable energy may satisfy such demand by simultaneously avoiding increase in greenhouse gas emissions (Hasanuzzaman et al., 2017).

3.2.3 Gross Domestic Product (per capita) (current US$)

The correlation between renewable energy development and overall economic growth of the state is more evident in countries with higher GDP comparing them to states with lower GDP (Ntanos et al., 2018). Therefore, measuring GDP's impact on renewable energy consumption in Central Asia is important for comparing with previous researches conducted worldwide and on other regions.

3.2.4 Global Innovation Index Score

Results of formerly conducted research indicate that the technology advancement plays a significant role in decarbonisation of the energy sector of a country, which may be justified by cost reduction of equipment used for the plants as well as attendant infrastructure construction (Bamati et al., 2019). Some of previous research used ICT, fixed broadband subscriptions or patents by residents and non-residents as a dependent variable for innovation's effect on renewable energy production or consumption (Awijen et al., 2022; Lee et al., 2023; Shinwari et al., 2022). However in this paper global innovation index is to be used to measure innovation's impact on the dependent variable because it provides a broader picture of a state's success in innovation advancement.

3.2.5 Foreign Direct Investment, net inflows (% of GDP)

According to the obsolescing bargain model, foreign investors, including multinational enterprises, have a stronger bargaining position compared to the government of a host state during the project planning and implementation stage. Such advantage on the side of a foreign investor is justified by the ownership of vast economic resources, advanced technology, and experience in the development of similar projects (Brewer, 1992).

4 PAPER HYPOTHESES

Taking into account the literature review, the hypothesis of this paper are as follows:

H1: It is expected that electricity production from natural gas sources will positively affect the renewable energy consumption as the gas is considered a cleaner fossil fuel that can be massively used in economy, facilitate implementation of gaseous renewable fuels, and provide balancing services to the grid that shifts to enlargement of renewable capacities (Kinnon et a., 2018).

H2: Access to electricity is expected to have a significant positive impact on renewable energy consumption due to weak grid infrastructure in Central Asia and need to facilitate energy delivery to all parts of countries (Hunt et al., 2024).

H3: Gross Domestic Product is anticipated to have a positive impact on Central Asia's renewable energy consumption because previous researches indicate that as GDP per capita grows so does the renewable advancement. (Yahya et al., 2019; Lupu et al., 2023)

H4: Global Innovation Index is projected to have a positive impact on the renewable energy consumption in Central Asia (Yahya et al., 2019).

H5: The previous research conducted provides that FDI is a variable with heterogeneous impact on renewables in both developed and developing countries (Hunt et al., 2024; Camacho et al., 2022). However, it is expected that foreign direct investment has the most positive significant effect on renewable energy development in Central Asia as the major projects are currently being developed by and are planned to be developed by major foreign investors with experience of renewable projects implementation with industry best international practice (ACWA Power, 2024; TotalEnergies, 2023; Masdar, 2022).

5 DATA AND METHODOLOGY

5.1 Data

This paper is based on panel data statistics from World Development Indicators database of the World Bank Group DataBank and Global Innovation Index reports for Central Asian countries, specifically Kazakhstan, Uzbekistan, Kyrgyzstan, Tajikistan, and Turkmenistan. The relevant data was collected for the period of 2011 to 2023. The research was conducted by collection of data on renewable energy consumption, electricity production from natural gas source, access to electricity, GDP per capita, and FDI from World Bank database, while global innovation index scores were taken from Global Innovation Index reports. The variables description is brought forward below in a table that outlines the variable, the abbreviation thereof, as well as researchers that used these variables in their studies.

Table 2 - Variables Description

Abbreviation	**Variable**	**Scholars**
Dependent Variable		
REC	Renewable energy consumption (% of total final energy consumption)	Hunt et al. (2024), Nyiwul (2017), Yahya et al. (2019)
Independent Variables		
NGP	Electricity production from natural gas sources	Author-Introduced
EA	Access to Electricity (% of population)	Hunt et al. (2024)
GDP	Gross Domestic Product (per capita) (current US$)	Yahya et al. (2019), Lupu et al. (2023)
GII	Global Innovation Index Score	Author-Introduced
FDI	Foreign Direct Investment, net inflows (% of GDP)	Hunt et al. (2024), Camacho Ballesta, J.A. et al. (2022)

5.2 Methodology

This study aims to assess empirically the impacts of certain world development indicators variables on the renewable energy consumption in Central Asia.

The regression model for the dependent variable of REC is put forward as follows:

REC = B0 + B1(NGP) + B2(EA) + B3(GDP) + B4(GII) + B5(FDI) + E

In the econometric model presented, ROC is the dependent variable, "B" is the coefficients, and both "B0" and "E" are the constant term and the error term respectively.

Table 3 - Summary Statistics

Variable	Mean	Min	Max	Standard Deviation
REC	14.94909	0	60	18.76942
NGP	2.443709	-1.646591	4.60517	2.303159
EA	99.715	98	100	.4463885
GDP	7.972811	6.686353	9.53897	.9659192
GII	26.83128	18.3	32.75	3.473839
FDI	3.860159	-4.854847	17.13123	3.458771

6 RESULTS OF THE RESEARCH

6.1 Summary Statistics

The descriptive statistics of both the dependent variable and independent variables is presented in the table above. It should be noted that mean figures for all variables are positive. Additionally, the dispersion around the mean is seen for REC with the maximum and minimum figures of 60 and 0 respectively with a mean of 14.94909 and standard deviation of 18.76942. The lowest mean is one of NGP that amounts to 2.443709 and its standard deviation is 2.303159 coming third.

6.2 Multicollinearity, Autocorrelation and Heteroscedasticity

	REC	NGP	EA	GDP	GII	FDI
REC	1.0000					
NGP	-0.8502	1.0000				
EA	-0.6813	0.6736	1.0000			
GDP	-0.7382	0.6161	0.7006	1.0000		
GII	-0.3354	0.0586	0.2319	0.7363	1.0000	
FDI	0.1622	-0.4505	-0.6185	-0.1627	0.3374	1.0000

Figure 1: Correlation matrix

The analysis of correlation indicates several positive correlations between the independent variables, specifically the correlation between NGP and EA is 67.36%, while one between EA and GDP is 70.06%. However, there are certain negative relationship that should be addressed, which are of especially vivid for EA and FDI, the correlations between which amounts to -61.85%.

Variable	VIF	1/VIF
GDP	12.19	0.082056
GII	7.45	0.134186
EA	4.21	0.237654
NGP	3.64	0.274872
FDI	2.75	0.364191
Mean VIF	6.05	

Figure 2: Variance Inflation Factor (VIF) test results

The Wooldridge test showed that for all the variables present in the panel data used for this research, there is autocorrelation as the probability value is significant ($p<0.01$) Additionally, the multicollinearity test indicates that VIF for GII and GDP is above 5 as well as the mean VIF, which amount to 6.05. Therefore, it may be concluded that there is a multicollinearity issue with the formula.

```
Wooldridge test for autocorrelation in panel data
H0: no first order autocorrelation
    F(  1,       2) =    206.974
           Prob > F =      0.0048
```

Figure 3: Wooldridge test for autocorrelation in panel data

```
Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        heteroskedastic
Correlation:   no autocorrelation

Estimated covariances      =         4          Number of obs     =         16
Estimated autocorrelations =         0          Number of groups  =          4
Estimated coefficients     =         3          Obs per group:
                                                              min =          2
                                                              avg =          4
                                                              max =          5
                                                Wald chi2(3)      =   3.22e+17
Log likelihood             =  32.18821          Prob > chi2       =     0.0000
```

REC	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
NGP	0	(omitted)				
EA	-.110209	1.50e-09	-7.3e+07	0.000	-.110209	-.110209
GDP	1.373508	2.60e-08	5.3e+07	0.000	1.373508	1.373508
GII	.0180164	2.48e-09	7.3e+06	0.000	.0180164	.0180164
FDI	1.129323	7.17e-09	1.6e+08	0.000	1.129323	1.129323
_cons	0	(omitted)				

Figure 4: FGLS regression results for heteroskedastic panels

```
Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs     =         16
Estimated autocorrelations =         0          Number of groups  =          4
Estimated coefficients     =         6          Obs per group:
                                                              min =          2
                                                              avg =          4
                                                              max =          5
                                                Wald chi2(5)      =     114.69
Log likelihood             = -53.08283          Prob > chi2       =     0.0000
```

REC	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
NGP	-6.269205	1.476095	-4.25	0.000	-9.162297	-3.376112
EA	-14.12368	6.390367	-2.21	0.027	-26.64857	-1.598789
GDP	-2.080525	5.625072	-0.37	0.711	-13.10546	8.944414
GII	.1666724	1.519502	0.11	0.913	-2.811498	3.144842
FDI	-1.952812	.6589559	-2.96	0.003	-3.244342	-.6612825
_cons	1453.432	623.9479	2.33	0.020	230.5164	2676.347

Figure 5: FGLS regression results for homoskedastic panels

```
. lrtest hetero homo, df(15)

Likelihood-ratio test                                 LR chi2(15) =   -170.54
(Assumption: hetero nested in homo)                   Prob > chi2 =    1.0000
```

Figure 6: Likelihood-ratio test results for heteroscedasticity

As for the heteroscedasticity test results brought forward above, the test indicates that p value is more than all levels of significance (1%, 5%, and 10%) and equals to 1, therefore, it may be concluded that there is no heteroscedasticity in the panel data used for the study.

Thus, summing the results of the tests conducted, it may be concluded that there is no heteroscedasticity present in the variables, however, the panel data failed to successfully undergo autocorrelation and multicollinearity tests. Therefore, the application of feasible generalized least square (FGLS) is advisable in this study.

Such model was employed in this research because the number of variables used (N), specifically 6 is less than the number of periods considered (T) (13). Therefore, since N<T in the model proposed for the research, the FGLS model is chosen to mitigate the risks posed by the multicollinearity and autocorrelation (Hoechle, 2007).

6.3 Regression Analysis with FGLS Model Application

The econometric model used above in the paper is displayed hereby with the results supplemented from the FGLS model.

REC = B0 + .6787645 (NGP) + .069103 (EA) + .4328639 (GDP) - .4328639 (GII) - .0518291 (FDI) + E

The findings of the regression analysis between REC and independent variables are brough forward in the table below. All the independent variables have p-value of less than 1%, 5%, or 10% which show their statistical significance for the purpose of measuring impacts thereof on the REC.

```
Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        heteroskedastic
Correlation:   common AR(1) coefficient for all panels  (0.4624)

Estimated covariances      =         4          Number of obs     =         16
Estimated autocorrelations =         1          Number of groups  =          4
Estimated coefficients     =         3          Obs per group:
                                                               min =          2
                                                               avg =          4
                                                               max =          5
                                                Wald chi2(3)      =   3.96e+17
                                                Prob > chi2       =     0.0000
```

REC	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
NGP	.6787645	7.57e-09	9.0e+07	0.000	.6787644	.6787645
EA	.069103	1.18e-09	5.8e+07	0.000	.069103	.069103
GDP	.4328639	2.16e-08	2.0e+07	0.000	.4328639	.432864
GII	-.3523311	3.36e-09	-1.0e+08	0.000	-.3523311	-.3523311
FDI	-.0518291	3.19e-10	-1.6e+08	0.000	-.0518291	-.0518291
_cons	0	(omitted)				

Figure 7: FGLS regression results with common AR(1) coefficient

Coming to specifics, NGP has a statistically significant positive impact on REC with its coefficient amounting to .6787645. That should be interpreted in a way that NGP increase in 1% will lead to the increase of REC by 0.67%. This finding goes in line with the hypothesis mentioned above in the article. Thus, large scale gas use for decarbonization of the economy and facilitation of gaseous renewable fuels development are topical for Central Asia and contribute to enlargement of renewable energy consumption. This is the first study that employs NGP as an independent variable and further research in both Central Asia and other countries should be conducted.

The positive impact is also conducted by the EA on REC as being statistically significance its coefficient amounts to .069103, which upholds the hypothesis proposed above. Therefore, despite the fact that EA impact on renewable energy consumption increase is less compared to NGP and GDP combined, it still should be taken into account as access to electricity represents solid grid conditions which is ready or is aiming to become fit for renewable capacities (Hunt et al., 2024).

Additionally, GDP is also statistically significant and positively affects REC. Specifically, 1% increase in GDP will boost the renewable energy consumption by 0.43%. Be interpreting such

statistics, it may be concluded that as the standard of living represented by the growth domestic product grows, so does the renewable energy consumption. It is worth noting that this finding goes in line with previous researches conducted (Yahya et al., 2019; Lupu et al., 2023).

Finally, global innovation index score and foreign direct investment have significant negative impact on renewable energy consumption. Specifically, having coefficients of -.3523311 and -.0518291 indicate that 1% increase in GII and 1% increase in FDI will decrease the renewable energy consumption by -0.35 % and -0.051% respectively.

With such findings on hand, we reject the hypothesizes put for these variables in methodology part above. Such results may be justified by the fact that the innovation increases energy efficiency, which leads to lowering of energy consumption overall, including renewable energy (Khan et al., 2021).

As for the FDI, the negative impact may be justified by the fact that the majority of FDI is done in energy producing facilities using traditional power sources (Marton et al., 2017). Thus, the share of renewable capacities does not keep up with investment in non-renewable projects in Central Asia.

7 CONCLUSION

This research paper studied the effects of various economic and quasi-economic factors on the renewable energy consumption in Central Asian countries. Having data collected from the World Development Indicators database of the World Bank Group DataBank and Global Innovation Index reports of the World Intellectual Property Organization figures on Kazakhstan, Uzbekistan, Kyrgyzstan, Tajikistan, and Turkmenistan in the period of 2011-2023 were analysed. REC was chosen as a dependent variable while electricity production from natural gas sources, access to electricity, gross domestic product (per capita), global innovation index score, and foreign direct investment were used as independent variables.

The analysis of the data collected was done in three main steps. First of all, the summary statistics indicated that the greatest mean was attributed to access to electricity (EA), meanwhile renewable energy consumption (REC) had the biggest standard deviation of 18.76942. Afterwards, Prior to running the regression model the multicollinearity, autocorrelation, and heteroscedasticity tests were undergone in this study. Finally, the FGLS model was used to conduct the regression analysis and identify impacts of independent variables on renewable energy consumption.

The results of the study showed that electricity production from natural gas sources, access to electricity, and gross domestic product have significant and favourable impact on renewable energy consumption in Central Asia. On the other hands, the findings imply that global innovation index score, and foreign direct investment have a considerable negative impact on renewable energy consumption. The whole model is statistically validated or best fitted.

In accordance with the research results, such indicators as electricity production from natural gas sources, access to electricity, and gross domestic product produce considerable positive impact on renewable energy consumption. Therefore, the governments of Central Asian countries should aspire to improve economic conditions of nations and people living therein, provide electricity access to as many people as possible, including those ones in rural areas, and facilitate development of energy facilities producing gas in order to create balancing capacities for the grid. Adversely, since foreign direct investments and innovation have significant negative impact on REC, the legislative branches of Central Asian countries should implement policies encouraging renewables-specific investment inflow into the country by providing certain financial and infrastructural benefits and advantages such as tax exemptions (reductions), easiness of

authorisations obtainment, etc. Additionally, the innovations should not be restrained as such because it does not have negative qualitative impact on REC through energy efficiency increase.

It is important to emhasise that the author(s)faced certain measurement issues during the stage of the data collection as transparent and accessible data was absent for NGP and GII, especially in relation to such countries as Tajikistan and Turkmenistan. That is, the data for those countries for variables mentioned was equal to zero or was absent. Taking into account the lack of particular data, there is a room for further empirical detailed study into variables in the Central Asian region that may be done in the future. The study provides certain findings, conclusions, and recommendations that may be useful to policymakers, investors in renewable capacities, and researchers in Central Asian countries and worldwide. The study of the impact of such variables as trade openness, political stability, and carbon tax policies on renewable energy consumption in Central Asia may be useful in further research to be done in the field.

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Impulsive Buying Behavior among Generation Z Consumers in the Fashion Industry

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ABSTRACT

This paper examines factors influencing impulsive buying behavior among Generation Z consumers in the fashion industry. The study responds to the increasing role of social media in fashion consumption, where advertisements, user interaction, peer responses and low-friction shopping environments can shorten the path from product exposure to unplanned purchase. Drawing on the Stimulus-Organism-Response framework, social media advertisements and social media community engagement are treated as external stimuli, impulse buying tendency is treated as the internal organism state, and impulsive buying behavior is treated as the behavioral response. A quantitative cross-sectional survey was conducted among Generation Z respondents aged 18 to 27 with fashion purchasing experience. After data cleaning, 208 valid responses were analyzed using descriptive statistics, reliability testing, Pearson correlation analysis and multiple regression in IBM SPSS. The findings show that social media advertisements were the strongest and most consistent predictor in the model. Advertisements had a positive and statistically significant effect on both impulse buying tendency and actual impulsive buying behavior. Social media community engagement also positively influenced impulsive buying behavior, although its effect on impulse buying tendency was not statistically significant. Impulse buying tendency significantly predicted impulsive buying behavior. Overall, four of the five hypotheses were supported. The results contribute to digital consumer behavior research by integrating advertising, community engagement, internal buying tendency and actual impulse behavior in one Generation Z fashion model. The findings also suggest that fashion marketers should treat advertisements and community engagement as distinct but connected mechanisms when designing social media strategies.

KEYWORDS: impulsive buying behavior; Generation Z; fashion industry; social media advertisements; community engagement; impulse buying tendency; consumer behavior; digital marketing

1 INTRODUCTION

Impulse buying has become an important topic in contemporary consumer behavior research because digital environments have changed the conditions under which purchase decisions are made. In traditional retail settings, unplanned purchases were still constrained by physical effort, time and a clearer separation between browsing and buying. In digital settings, this separation is weaker because consumers can encounter, evaluate and purchase a product within the same platform and often within the same moment (Nyrhinen et al., 2024; Redine et al., 2023).

This transformation is especially visible in social media environments, where commercial content is embedded in ordinary online activity. Fashion products appear while users scroll through feeds, watch videos, interact with influencers, follow brand pages and communicate with peers. Social commerce therefore reduces the distance between exposure, evaluation and transaction (Azad Moghddam et al., 2024). In such contexts, impulsive buying becomes a realistic behavioral

response to the design and logic of digital platforms rather than only an occasional side effect of online shopping.

Generation Z is particularly relevant to this topic because this cohort developed consumption habits in a context of permanent connectivity, algorithmic visibility and continuous exposure to visual content. For Generation Z, social media is not an additional channel placed outside everyday life; it is part of the environment in which preferences are formed, products are discovered and social meanings are interpreted. The fashion industry is especially compatible with this environment because fashion goods are connected with identity, appearance, self-presentation and social belonging.

Although prior research shows that social media matters for consumer behavior, existing studies often examine advertising, engagement, internal states or purchase intention separately. Fewer studies integrate social media advertisements, community engagement, impulse buying tendency and actual impulsive buying behavior in one model focused specifically on Generation Z fashion consumers. The research question of this paper is therefore: what factors influence impulsive buying behavior among Generation Z consumers in the fashion industry?

2 LITERATURE REVIEW AND HYPOTHESES

2.1 Impulsive buying and digital fashion consumption

Impulse buying is commonly understood as spontaneous, unplanned and immediate buying behavior. In online settings, it is shaped by both external digital stimuli and internal consumer responses (Kimiagari & Asadi Malafe, 2021). Mobile and social commerce platforms can strengthen impulsive buying because product exposure, social interaction and purchase opportunities occur during the same browsing experience (Zhang et al., 2022; Azad Moghddam et al., 2024).

Fashion makes this process especially important. Fashion purchases are not only functional; they also carry symbolic meaning and are influenced by trends, social comparison and identity. Prior research on Instagram and Generation Z fashion consumers shows that advertisements, opinion leaders and user-generated content can stimulate positive emotions and impulse purchases (Djafarova & Bowes, 2021).

2.2 Social media advertisements

In this study, social media advertisements refer to brand-created promotional content on social media platforms, including offers, sponsored fashion content and advertising messages that encourage purchase consideration. Previous research indicates that social media advertising can influence consumer behavior through trust, positive emotions, advertising value and the urge to buy impulsively (Feng et al., 2023; Jabeen et al., 2024). In fashion-related contexts, advertising and brand-generated content have also been linked to Generation Z purchase and impulse buying behavior (Djafarova & Bowes, 2021; El-Shihy & Awaad, 2025).

Accordingly, social media advertisements are expected to affect both the internal readiness to buy impulsively and the actual behavior that follows. H2 proposes that social media advertisements positively influence impulsive buying behavior. H4 proposes that social media advertisements positively influence impulse buying tendency.

2.3 Social media community engagement

Social media community engagement refers to consumers' interaction with fashion-related brand and peer content, including following, liking, commenting, sharing, discussing products and paying attention to peer reactions. Prior studies show that online communities can shape

information exchange, word-of-mouth and social connection (Al-Khasawneh et al., 2023; Zhang & Ahmad, 2024). However, the effect of community engagement may be weaker or more context dependent than the effect of advertising (Singh et al., 2023; El-Shihy & Awaad, 2025).

This distinction is important because community engagement may influence buying behavior through social approval and visible interaction rather than through direct promotional pressure. Therefore, H1 proposes that social media community engagement positively influences impulsive buying behavior. H5 proposes that social media community engagement positively influences impulse buying tendency.

2.4 Impulse buying tendency and S-O-R framework

The Stimulus-Organism-Response framework explains how external cues influence internal states and then produce behavioral responses. In this paper, social media advertisements and social media community engagement are the stimuli, impulse buying tendency is the organism, and impulsive buying behavior is the response. Impulse buying tendency is defined as the consumer's immediate inclination or susceptibility to make a spontaneous purchase after exposure to social media stimuli.

Prior studies support the role of internal impulse-oriented states in translating online stimuli into behavior. Singh et al. (2023) found that an internal pre-behavioral impulse state significantly predicted actual impulse buying behavior, while Feng et al. (2023) and Xue et al. (2024) showed that digital stimuli become behaviorally stronger when they shape internal states. Thus, H3 proposes that impulse buying tendency positively influences impulsive buying behavior.

3 METHODOLOGY

This study used a quantitative research approach and a cross-sectional survey design. This approach was appropriate because the purpose was to test hypotheses derived from the literature review and the S-O-R framework by examining relationships among clearly specified constructs. The cross-sectional design captured respondents' perceptions, buying tendencies and self-reported behavior at one point in time; therefore, the results are interpreted as associations rather than definitive causal effects.

The target population consisted of Generation Z consumers aged 18 to 27 who had experience purchasing fashion products and were familiar with social media environments. A non-probability convenience sampling method was used. Respondents were recruited through university student networks and social media platforms such as Instagram and Telegram. After screening and data cleaning, the final sample consisted of 208 valid responses.

Data were collected through an online self-administered questionnaire created in Google Forms. Respondents provided electronic informed consent before completing the survey. The questionnaire was available in English and Russian to reduce possible language barriers. No names, email addresses or other identifying information were collected.

The questionnaire items were adopted and adapted from the validated measurement scales developed by Singh et al. (2023). All construct items were measured using a five-point Likert scale ranging from 1 = strongly disagree to 5 = strongly agree. Impulsive Buying Behavior (IBB) was measured with eight items; Social Media Community Engagement (SMC) with four items; Social Media Advertisements (SMA) with four items; and Impulse Buying Tendency (IBT) with three items. The collected data were analyzed in IBM SPSS using descriptive statistics, reliability analysis, Pearson correlation analysis and multiple regression.

4 RESULTS

The final sample included 208 Generation Z respondents. Gender was reported by 206 participants; 153 were female, 53 were male and 2 preferred not to say. Age was divided into three groups: 18-20, 21-23 and 24-27 years. The age mean score was 1.94 with a standard deviation of 0.736.

Table 1 Respondent Profile by Gender

Category	Frequency	Percent	Valid Percent
Female	153	73.6	74.3
Male	53	25.5	25.7
Prefer not to say	2	1.0	1.0

Reliability analysis showed strong internal consistency for all main constructs. Cronbach's alpha exceeded the commonly accepted threshold of 0.70 for every scale, which confirmed that the measurement items were suitable for further analysis.

Table 2 Reliability Analysis of Study Constructs

Construct	Number of Items	Cronbach's alpha
Impulsive Buying Behavior (IBB)	8	0.888
Social Media Community Engagement (SMC)	4	0.884
Social Media Advertisements (SMA)	4	0.937
Impulse Buying Tendency (IBT)	3	0.958

Descriptive statistics showed that respondents reported the highest mean score for Social Media Advertisements (M = 3.8498), followed by Impulse Buying Tendency (M = 3.7965), Social Media Community Engagement (M = 3.5072) and Impulsive Buying Behavior (M = 3.2127).

Table 3 Descriptive Statistics of Main Variables

Variable	N	Mean	Std. Deviation
Impulsive Buying Behavior (IBB)	208	3.2127	0.82886
Impulse Buying Tendency (IBT)	208	3.7965	1.08011
Social Media Community Engagement (SMC)	208	3.5072	1.03411

Social Media Advertisements (SMA)	208	3.8498	0.98875

Pearson correlation analysis showed positive relationships among all main variables. The strongest correlation was between Social Media Advertisements and Impulse Buying Tendency (r = 0.822), followed by Social Media Advertisements and Impulsive Buying Behavior (r = 0.772). These results supported the relevance of testing the proposed regression models.

Table 4 Pearson Correlation Matrix

Variable	1	2	3	4
1. IBB	1.000	0.706	0.681	0.772
2. IBT	0.706	1.000	0.623	0.822
3. SMC	0.681	0.623	1.000	0.691
4. SMA	0.772	0.822	0.691	1.000

The first regression model tested the effect of Impulse Buying Tendency on Impulsive Buying Behavior. The result was positive and statistically significant (B = 0.542, beta = 0.706, p < .001), supporting H3.

Table 5 Regression: Effect of Impulse Buying Tendency on Impulsive Buying Behavior

Predictor	B	SE B	β	t	p
Constant	1.156	0.149	—	7.735	< .001
Impulse Buying Tendency	0.542	0.038	0.706	14.309	< .001

The second regression model tested the effects of Social Media Community Engagement and Social Media Advertisements on Impulse Buying Tendency. Social Media Advertisements had a strong positive and statistically significant effect (B = 0.818, beta = 0.749, p < .001), supporting H4. Social Media Community Engagement had a positive but not statistically significant effect (B = 0.110, beta = 0.105, p = .055), so H5 was not supported.

Table 6 Regression: Effects of SMC and SMA on Impulse Buying Tendency

Predictor	B	SE B	β	t	p
Constant	0.262	0.176	—	1.485	.139
Social Media Community Engagement	0.110	0.057	0.105	1.926	.055

Social Media Advertisements	0.818	0.060	0.749	13.712	< .001

The final regression model tested the joint effects of Impulse Buying Tendency, Social Media Community Engagement and Social Media Advertisements on Impulsive Buying Behavior. All three predictors were statistically significant. Social Media Advertisements remained the strongest predictor (B = 0.372, beta = 0.444, p < .001), followed by Social Media Community Engagement (B = 0.212, beta = 0.264, p < .001) and Impulse Buying Tendency (B = 0.136, beta = 0.177, p = .017).

Table 7 Joint Regression Predicting Impulsive Buying Behavior

Predictor	**B**	**SE B**	**β**	**t**	**p**
Constant	0.523	0.143	—	3.649	< .001
Impulse Buying Tendency	0.136	0.056	0.177	2.399	.017
Social Media Community Engagement	0.212	0.047	0.264	4.549	< .001
Social Media Advertisements	0.372	0.067	0.444	5.572	< .001

The hypothesis testing summary shows that four of the five proposed hypotheses were supported. The only unsupported hypothesis was the expected effect of Social Media Community Engagement on Impulse Buying Tendency.

Table 8 Summary of Hypothesis Testing

Hypothesis	**Statement**	**Result**
H1	Social media community engagement positively influences impulsive buying behavior.	Supported
H2	Social media advertisements positively influence impulsive buying behavior.	Supported
H3	Impulse buying tendency positively influences impulsive buying behavior.	Supported
H4	Social media advertisements positively influence impulse buying tendency.	Supported

H5	Social media community engagement positively influences impulse buying tendency.	Not Supported

5 DISCUSSION AND IMPLICATIONS

The results show that impulsive fashion purchases among Generation Z consumers are shaped by both external social media influences and internal readiness to buy. The strongest finding concerns social media advertisements. Advertising content significantly influenced both impulse buying tendency and impulsive buying behavior, which indicates that promotional content does not merely increase visibility; it can also activate the internal readiness that leads to spontaneous purchase decisions.

Social media community engagement also had a positive and significant effect on impulsive buying behavior. This suggests that likes, comments, peer content, discussions and visible user reactions can contribute to unplanned buying in fashion contexts. However, community engagement did not significantly predict impulse buying tendency. This may mean that engagement supports purchase behavior through social approval or reinforcement rather than by directly creating the internal urge to buy.

The results support the use of the S-O-R framework in digital fashion consumption. Advertisements and engagement operate as different stimuli, impulse buying tendency functions as an internal state, and impulsive buying behavior appears as the response. The findings also show that advertisements and community engagement should not be treated as the same form of social media influence. Advertisements were the stronger and more consistent driver, while engagement played a weaker but still meaningful role.

For fashion marketers targeting Generation Z, the results suggest that social media advertising should be clear, visually direct and action-oriented. Product information, offers and purchase options should be easy to understand and access. At the same time, brands should not ignore engagement, because peer interaction, comments and user-generated content can strengthen the social context around a product. A balanced strategy should use advertising to create the first impulse and community engagement to support trust, visibility and social proof.

6 LIMITATIONS AND CONCLUSION

This study has several limitations. First, the sample was collected through non-probability convenience sampling, which limits the generalizability of the findings. Second, the cross-sectional design means that the results show associations rather than causal effects. Third, the study relied on self-reported data, so responses may be affected by memory bias or social desirability. Fourth, the sample included a higher proportion of female respondents, which may have influenced the results in a fashion-related study. Finally, the study used a platform-neutral approach to social media and therefore did not compare specific platforms such as Instagram, TikTok or Telegram.

Future research could use longitudinal or experimental designs, larger and more diverse samples, platform-specific comparisons and behavioral data such as purchase records or simulated shopping tasks. Additional variables, including influencer credibility, price sensitivity, scarcity cues, self-control and emotional states, could also be included to build a more detailed explanation of impulsive buying.

In conclusion, this paper examined impulsive buying behavior among Generation Z consumers in the fashion industry through an integrated S-O-R model. The findings show that

social media advertisements were the strongest and most stable factor, influencing both impulse buying tendency and actual impulsive buying behavior. Social media community engagement influenced impulsive buying behavior but did not significantly influence impulse buying tendency. Impulse buying tendency also significantly predicted impulsive buying behavior. Overall, the study demonstrates that impulsive fashion buying among Generation Z is shaped by the interaction of digital stimuli and internal buying readiness.

6.1 Additional interpretation of the findings

A more detailed interpretation of the findings suggests that advertising and community engagement operate at different levels of the consumer decision process. Advertising appears to be closer to the moment of product evaluation because it usually presents a product, price, offer, image or direct call to action. For this reason, it can more easily create immediate purchase readiness and directly stimulate unplanned buying. Community engagement, in contrast, is less controlled by the brand and is more relational. It may create an environment in which products feel more socially visible and accepted, but it may not always create the same immediate internal pressure to buy.

This difference helps explain why social media community engagement significantly predicted impulsive buying behavior but did not significantly predict impulse buying tendency. Consumers may not consciously experience likes, comments and peer discussion as an immediate urge to buy. However, these elements can still normalize the product, reduce hesitation and increase confidence in a spontaneous purchase. Therefore, community engagement can still matter for behavior even when its effect on internal buying tendency is weaker.

The findings are also relevant to the fashion context because fashion products are highly visual and socially interpreted. A consumer may see a product in an advertisement, then observe comments, styling examples, peer reactions or user-generated content around the same product. This sequence can make the product appear more desirable and easier to justify. In this sense, the role of social media is not limited to direct persuasion. It also creates a social environment in which fashion choices become visible, comparable and emotionally engaging.

For Generation Z, this process may be especially strong because social media is a normal part of daily communication and self-presentation. Fashion-related content is often encountered without an active shopping intention. A user may open a platform for entertainment or communication and still be exposed to promotional and community cues. This makes the distinction between entertainment, social interaction and shopping less clear, which increases the relevance of impulsive buying research in digital fashion settings.

6.2 Extended practical recommendations

First, fashion brands should design social media advertisements that quickly communicate the product value. Since advertisements were the strongest predictor, the product image, price logic, promotion and purchase route should be clear. Overly complex messages may reduce the speed of response that is typical of impulsive buying. Clear visual presentation, simple captions and visible links to purchase can make the advertisement more effective.

Second, brands should connect advertising with community content. A paid advertisement can create initial attention, but consumer comments, reviews, reposts and styling examples can support the decision by providing social proof. This means that marketers should not measure campaign success only by views or likes. They should also examine whether advertisement exposure is followed by interaction, product-page visits, saved posts, direct messages and purchases.

Third, brands should use engagement ethically. The results show that social media can encourage unplanned purchases, but this should not mean manipulating young consumers through excessive pressure. Fashion marketers can use transparent information, accurate product descriptions and responsible promotional messages while still creating attractive campaigns. This is especially important when targeting young adults who may be sensitive to trends, scarcity messages and peer comparison.

Fourth, brands should reduce friction in the buying process while maintaining clarity. If a consumer develops an impulse buying tendency, long or confusing checkout processes may interrupt the purchase decision. At the same time, consumers should still have access to information about size, return policy, price and delivery. A responsible low-friction process should be convenient without hiding important details.

6.3 Final conclusion

Overall, the paper confirms that impulsive buying among Generation Z fashion consumers is not caused by one isolated factor. It is shaped by the interaction of promotional stimuli, social interaction and internal buying readiness. The strongest role of social media advertisements shows that direct promotional content remains highly influential in digital fashion settings. At the same time, the supported effect of community engagement on impulsive buying behavior shows that social context also matters. The study therefore contributes to a more integrated understanding of how social media environments influence unplanned fashion purchases among Generation Z consumers.

6.4 Research contribution

The contribution of the paper is threefold. First, it brings together variables that are often discussed separately in previous studies. Social media advertisements, social media community engagement and impulse buying tendency are examined in one model, which makes it possible to compare their effects rather than assume that all forms of social media influence work in the same way. This is important because the empirical results show clear differences between promotional content and community-based interaction.

Second, the paper focuses on actual impulsive buying behavior rather than stopping only at purchase intention. Many social media studies examine intention because it is easier to measure, but impulsive buying is a behavioral outcome that involves a spontaneous and unplanned purchase decision. By including actual self-reported impulsive buying behavior as the dependent variable, the study provides a more behavior-oriented explanation of Generation Z fashion consumption.

Third, the study applies the S-O-R framework to a specific fashion context. The framework is useful because it recognizes that social media cues do not automatically produce behavior. Instead, they influence the consumer through an internal state. In this study, impulse buying tendency captures this internal readiness. The significant effect of impulse buying tendency on impulsive buying behavior confirms the relevance of this structure for explaining social-media-driven fashion purchases.

The paper also contributes to managerial understanding by showing that social media activity should be evaluated at different levels. An advertisement may be effective because it provides a direct product cue and purchase trigger. Community engagement may be effective because it adds social interpretation and confidence around the product. These mechanisms can support each other, but they should not be measured or managed as identical outcomes.

6.5 Boundary conditions

The results should be interpreted within the specific boundaries of the study. The sample consisted of Generation Z consumers with fashion purchasing experience, and the survey measured perceptions and self-reported behavior rather than actual transaction data. Therefore, the conclusions are most relevant for understanding perceived and reported impulsive fashion buying in social-media-based environments. The findings should not be generalized automatically to all product categories or all age groups.

Another boundary concerns the platform-neutral treatment of social media. This helped build a general model, but platform environments differ in their content format, algorithmic design, interaction style and purchase integration. For example, short-video platforms may produce stronger emotional activation, while image-based platforms may support comparison and style inspiration. Future research can test whether the strength of advertisements and community engagement differs across platforms.

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Market Orientation and SME Performance in Kazakhstan: A Quantitative Study of the Moderating Role of Competitive Intensity

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ABSTRACT

This study examines the effect of market orientation on the performance of small and medium-sized enterprises (SMEs) in Kazakhstan and tests whether competitive intensity moderates this relationship. Market orientation is conceptualised through the three behavioural dimensions of the MARKOR scale—intelligence generation, intelligence dissemination, and responsiveness—and is interpreted as a marketing-domain manifestation of dynamic capabilities, with the three dimensions mapped onto the sensing–seizing–transforming sequence of the Dynamic Capabilities Framework. The contingency formulation of market orientation provides the basis for the moderation hypotheses. Data were collected through a bilingual (English–Russian) online questionnaire from 150 owner-managers of Kazakhstani SMEs and analysed using hierarchical multiple regression. All three market-orientation dimensions exert positive and statistically significant effects on SME performance, with responsiveness the strongest predictor ($\beta = 0.242$, $p < 0.001$), followed by intelligence dissemination ($\beta = 0.196$, $p < 0.001$) and intelligence generation ($\beta = 0.148$, $p < 0.001$). This ordering mirrors the transforming–seizing–sensing hierarchy implied by the Dynamic Capabilities Framework. Contrary to the contingency prediction, competitive intensity did not significantly moderate any of the three relationships. The findings indicate that market orientation operates as a stable strategic capability whose performance benefits are broadly available to SMEs regardless of competitive conditions, and that the principal performance lever lies in acting on market intelligence rather than merely collecting it. The study extends the market-orientation literature to the under-researched Central Asian context and offers practical guidance for SME managers and policymakers.

KEYWORDS: market orientation; MARKOR; SME performance; competitive intensity; dynamic capabilities; Kazakhstan.

1 INTRODUCTION

Small and medium-sized enterprises (SMEs) are central to the economies of emerging markets, where they constitute the principal source of employment outside the extractive and public sectors and a key instrument of economic diversification. In Kazakhstan, SMEs account for approximately 99.5 percent of all registered legal entities (Bureau of National Statistics of the Republic of Kazakhstan, 2025). As of 1 October 2025, some 2.18 million operating SMEs employed about 4.52 million people—46.2 percent of the economically active population—and contributed roughly 40.5 percent of gross domestic product, with the number of SMEs growing by 6.1 percent over the preceding twelve months (Bureau of National Statistics of the Republic of

Kazakhstan, 2026). Despite the scale and dynamism of this sector, empirical research on the determinants of SME performance in Kazakhstan remains scarce, and the emergence of performance through market-based strategy has not been examined.

Among the firm-level explanations of performance, market orientation is one of the most extensively validated. Kohli and Jaworski (1990) define market orientation as the organisation-wide generation of, dissemination of, and responsiveness to market intelligence, positioning it not as a function of the marketing department but as a firm-wide behavioural orientation towards customers and competitors. A meta-analysis of more than one hundred studies confirms a robust positive association between market orientation and firm performance (Kirca, Jayachandran, & Bearden, 2005). The present study interprets market orientation through the Dynamic Capabilities Framework (Teece, 2007), under which firm performance depends not only on resource endowments but on the capacity to sense opportunities, seize them, and reconfigure the resource base in response to environmental change. On this reading, market orientation is a marketing-domain manifestation of dynamic capabilities (Day, 2011; Morgan, 2012; Hou & Chien, 2010): intelligence generation corresponds to sensing, intelligence dissemination to seizing, and responsiveness to transforming.

This correspondence is particularly relevant for emerging economies, where firms operate under uncertainty, institutional change, and resource scarcity. Kazakhstan exemplifies these conditions: a post-Soviet, resource-dependent economy marked by currency fluctuations, inflation, and regulatory volatility, and shaped by a managerial legacy in which customer and competitor orientation were historically absent under central planning (Michailova, 2000; Latukha & Malko, 2019). A further question concerns the role of the external environment. The contingency formulation of market orientation (Jaworski & Kohli, 1993) holds that environmental conditions—and competitive intensity in particular—strengthen the market orientation–performance relationship. Yet empirical evidence on this moderating role is mixed and frequently non-significant (Slater & Narver, 1994; Liu, Luo, & Shi, 2003; Kirca et al., 2005), with recent studies continuing to report both reinforcing (Mahdi et al., 2024; Crick, Friske, & Morgan, 2024) and null or negative effects (Keelson et al., 2024; Alqahtani, Uslay, & Yeniyurt, 2024).

Three empirical gaps motivate this study. First, the bulk of market-orientation research concerns large firms in developed economies, whereas SMEs operate under different conditions of limited resources, informal structures, and proximity to customers (Raju, Lonial, & Crum, 2011; Hanaysha & Al-Shaikh, 2024). Second, evidence from developing economies has concentrated on East Asia and Latin America, leaving Central Asia largely unexamined. Third, the moderating role of competitive intensity remains unresolved, and its applicability to Kazakhstani SMEs is unknown. Accordingly, this study pursues three objectives in the context of Kazakhstani SMEs: (RO1) to examine the effect of the three MARKOR dimensions on SME performance; (RO2) to determine whether competitive intensity moderates these relationships; and (RO3) to identify which dimension exerts the strongest effect. The remainder of the paper reviews the relevant literature and develops the hypotheses, describes the methodology, reports the results, and discusses their theoretical and practical implications.

2 LITERATURE REVIEW AND HYPOTHESES

2.1 Theoretical Background

The study rests on two complementary perspectives. The Dynamic Capabilities Framework explains why market-oriented behaviour translates into performance gains in volatile

environments; the contingency formulation of market orientation specifies the environmental conditions under which those gains are expected to vary.

The Dynamic Capabilities Framework, advanced by Teece, Pisano, and Shuen (1997) and elaborated by Teece (2007), responds to a limitation of the Resource-Based View (Barney, 1991): in environments of rapid change, sustainable advantage depends less on what a firm owns than on its capacity to reconfigure what it owns. Teece (2007) organises dynamic capabilities into three clusters—sensing (detecting opportunities and threats), seizing (mobilising resources and committing to decisions), and transforming (reconfiguring structures, processes, and offerings). Eisenhardt and Martin (2000) recast these as identifiable, describable patterns rather than idiosyncratic routines, while Zollo and Winter (2002) distinguish operational routines from the dynamic capabilities that alter them through learning. A key implication is that dynamic capabilities are not confined to large firms: any firm that systematically monitors its environment, shares what it learns, and adjusts its actions exercises them, regardless of size or formality. Within strategic marketing, market orientation has been read as precisely this kind of capability (Day, 2011; Morgan, 2012; Hou & Chien, 2010), an interpretation supported empirically by Morgan, Vorhies, and Mason (2009).

The contingency formulation, articulated by Jaworski and Kohli (1993), proposes that the strength of the market orientation–performance relationship varies with the firm's external environment. Three moderators were advanced—market turbulence, technological turbulence, and competitive intensity—each expected to strengthen the relationship. This is an amplification argument rather than a rejection of the main effect. Empirically, however, environmental moderators have produced weak and inconsistent results since Slater and Narver (1994), and the meta-analytic evidence indicates that they exert weaker and less consistent effects than the direct impact of market orientation (Kirca et al., 2005). The persistence of this pattern raises the possibility that the stronger contingency claim is simply incorrect, that moderation effects are real but small and under-powered in typical samples, or that self-reported measures of competitive intensity fail to capture the dimensions of competition that matter for capability deployment.

Both perspectives carry particular weight in Kazakhstan. The Dynamic Capabilities Framework suggests that firms facing macroeconomic volatility survive by sensing change, mobilising resources, and reconfiguring their offerings; the contingency perspective suggests that the returns to market orientation may be sensitive to competitive conditions. Taken together, they motivate the empirical model developed below.

2.2 Market Orientation and Its Dimensions

The intellectual antecedents of market orientation lie in the proposition that firm success rests on a sustained focus on customer needs (Drucker, 1954; Levitt, 1960). Two near-simultaneous contributions formalised the construct in 1990. Kohli and Jaworski (1990) defined market orientation behaviourally, as the organisation-wide generation, dissemination, and responsiveness to market intelligence; Narver and Slater (1990) defined it culturally, through customer orientation, competitor orientation, and interfunctional coordination. The two perspectives are complementary and were operationalised, respectively, through the MARKOR scale (Kohli, Jaworski, & Kumar, 1993) and the MKTOR scale (Narver & Slater, 1990). Subsequent work treated market orientation as a firm capability (Day, 1994) and as a driver of organisational learning (Slater & Narver, 1995).

This study adopts the behavioural perspective for three reasons. First, it maps directly onto the sensing–seizing–transforming structure of the Dynamic Capabilities Framework. Second, behaviour is more directly observable and measurable in SMEs, which often lack the formal

cultural artefacts through which orientation is expressed in larger firms. Third, the MARKOR scale has been widely validated in emerging-market and SME settings. The three behavioural dimensions are therefore the focal constructs. Intelligence generation (MIG) is the firm-wide gathering of information about customers, competitors, and the broader environment. Intelligence dissemination (MID) is the distribution of that intelligence across organisational units and hierarchical levels. Responsiveness (MRE) is the conversion of intelligence into action through changes in price, product, communication, and strategy. Recent SME-focused studies confirm the positive market orientation–performance link across diverse contexts (Reimann, Carvalho, & Duarte, 2022; Butkouskaya, Llonch-Andreu, & Alarcón-del-Amo, 2024; Hanaysha & Al-Shaikh, 2024; Kaur & Bedi, 2024).

2.3 SME Performance and Competitive Intensity

Firm performance in SMEs is commonly assessed through subjective, multidimensional measures, for three reasons that apply directly to the present setting. Objective financial data are generally unavailable for privately held Kazakhstani SMEs (Dess & Robinson, 1984; Sapienza, Smith, & Gannon, 1988); subjective and objective measures exhibit strong convergent validity, with correlations typically in the 0.4–0.6 range (Wall et al., 2004); and a multidimensional conceptualisation captures the trade-offs firms make between growth, profitability, and market position (Venkatraman & Ramanujam, 1986). Competitive intensity (MCI) denotes the degree to which a firm perceives its environment as competitive—the number and aggressiveness of competitors and the frequency of competitive moves (Jaworski & Kohli, 1993)—and is conceptually distinct from market and technological turbulence (Crick et al., 2024).

The contingency rationale for competitive intensity as a moderator follows an amplification logic: under low competitive intensity, the returns to market-oriented behaviour are modest, whereas under high competitive intensity, timely and well-informed responses become more valuable as competitors act more frequently and customers face more alternatives. Yet the mixed evidence may reflect three considerations that bear on this study. Substantively, market orientation may be a context-independent capability whose effects vary little across environments (Kirca et al., 2005). Methodologically, detecting interaction effects requires substantially larger samples than detecting main effects (Aiken & West, 1991). Contextually, restricted variance in competitive intensity—common in volatile emerging markets where most firms face elevated pressure—reduces the contrast against which moderation can be detected.

2.4 Hypotheses and Conceptual Framework

The direct relationships are grounded in the Dynamic Capabilities Framework. Intelligence generation, as sensing, enables firms to detect environmental change; in Kazakhstan's volatile setting, accurate market intelligence is a prerequisite for timely strategic adjustment (Kaur & Bedi, 2024). Intelligence dissemination, as seizing, mobilises the organisation around a shared reading of the environment; in SMEs, where structures are informal, effective internal communication determines whether information informs decisions (Butkouskaya et al., 2024). Responsiveness, as transforming, marks the point at which intelligence becomes action; because the transforming phase is held to be the most consequential in turbulent environments (Teece, 2007; Nyamrunda & Freeman, 2021), responsiveness is expected to exert the strongest direct effect. These arguments yield three direct-effect hypotheses:

H1: Intelligence generation positively influences SME performance.

H2: Intelligence dissemination positively influences SME performance.

H3: Responsiveness positively influences SME performance.

The contingency perspective implies that competitive intensity amplifies each of these relationships, as detecting, sharing, and responding to market information becomes more important under stronger competitive pressure (Jaworski & Kohli, 1993; Slater & Narver, 1994). This yields three moderation hypotheses:

H1a: Competitive intensity moderates the relationship between intelligence generation and SME performance.

H2a: Competitive intensity moderates the relationship between intelligence dissemination and SME performance.

H3a: Competitive intensity moderates the relationship between responsiveness and SME performance.

Figure 1 presents the conceptual framework. The three MARKOR dimensions are modelled as separate predictors rather than a single composite, so that their individual effects can be compared and the sensing–seizing–transforming ordering can be tested.

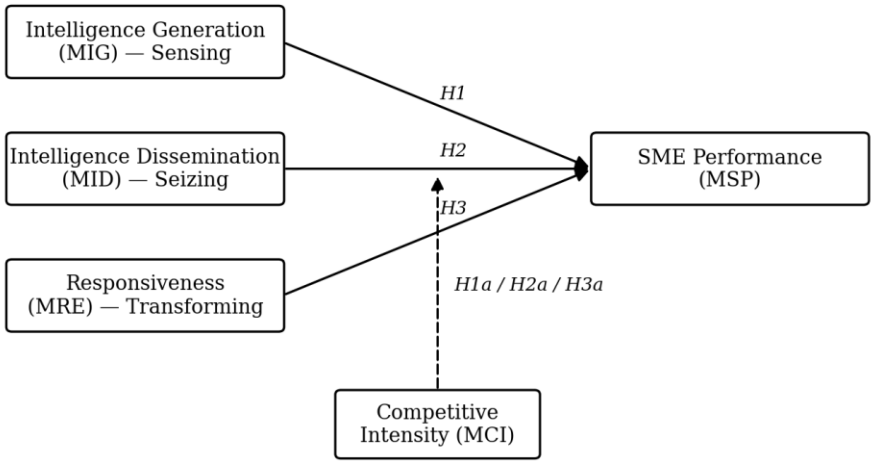


Figure 1. Conceptual framework of the study.

3 METHODOLOGY

3.1 Research Design

The study adopts a positivist paradigm and a quantitative, deductive, cross-sectional design (Bryman & Bell, 2015; Saunders, Lewis, & Thornhill, 2019). Six hypotheses derived from the MARKOR model (Kohli et al., 1993), the contingency perspective (Jaworski & Kohli, 1993), and the Dynamic Capabilities Framework (Teece, 2007) were operationalised and tested on survey data. A cross-sectional design is standard in market-orientation research (Narver & Slater, 1990; Jaworski & Kohli, 1993); while it precludes strong causal inference and cannot rule out reverse causality, it is appropriate for the study's objectives.

3.2 Sample and Data Collection

The target population comprised Kazakhstani SMEs—firms with fewer than 250 employees under the national classification—represented by their owners, founders, or senior managers, who are the appropriate key informants for firm-level constructs (Kumar, Stern, & Anderson, 1993).

Because Kazakhstan has no centralised SME registry, non-probability purposive and snowball sampling were used. Data were collected over four weeks in April 2026 through a Google Forms questionnaire distributed via WhatsApp and Instagram (110 respondents) and snowball referrals (40 respondents). Of 161 responses received, 11 were removed for missing data, leaving a final sample of 150 valid responses. The questionnaire was developed in English and translated into Russian using back-translation to ensure semantic equivalence; Russian is the predominant business language among Kazakhstani SMEs.

3.3 Measures

Established scales were used wherever possible. The three MARKOR dimensions were measured with thirteen items from Kohli et al. (1993) on a seven-point Likert scale referring to the firm's practices over the past twelve months. Competitive intensity was measured with five items from Jaworski and Kohli (1993) on the same scale. SME performance was measured with six items based on Dess and Robinson (1984) and the multidimensional framework of Venkatraman and Ramanujam (1986), on which respondents rated their firm's performance over the past three years relative to competitors using a five-point comparative scale (1 = much worse, 3 = about the same, 5 = much better). The use of different response scales and reference periods for predictors and outcome served as a procedural control for common method variance (Podsakoff et al., 2003). Reverse-coded items performed poorly in a pilot study (n = 43) and were removed. The final instrument comprised 37 items and required 10–15 minutes to complete. Table 1 summarises its composition.

Table 1. Questionnaire composition.

Section	Content	Items	Response scale	Reference
A	Screening questions	4	Categorical	Developed for study
B	Market orientation (MIG, MID, MRE)	13	7-point Likert	Kohli et al. (1993)
C	Competitive intensity (MCI)	5	7-point Likert	Jaworski & Kohli (1993)
D	SME performance (MSP)	6	5-point comparative	Dess & Robinson (1984)
E	Firm demographics	5	Categorical	Developed for study
F	Respondent information	4	Categorical	Developed for study
Total		**37**		

Note. MIG = Intelligence Generation; MID = Intelligence Dissemination; MRE = Responsiveness.

3.4 Analytical Approach

Data were analysed in SPSS (version 20). Composite variables were computed as item means. Following data screening—listwise deletion of missing values, outlier detection using standardised scores (±3.29), and assessment of skewness, kurtosis, and multicollinearity—descriptive statistics, Cronbach's alpha coefficients, and Pearson correlations were computed. The six hypotheses were tested using hierarchical multiple regression, consistent with the original contingency formulation (Jaworski & Kohli, 1993). For each MARKOR dimension, Step 1 entered

the dimension and competitive intensity as main effects (testing H1–H3), and Step 2 added their interaction term (testing H1a–H3a). Predictor and moderator were mean-centred before forming the interaction term, and simple-slope plots were generated at low (−1 SD) and high (+1 SD) levels of the moderator (Aiken & West, 1991).

4 RESULTS

4.1 Sample Profile

Preliminary screening confirmed that the retained 150 responses met the inclusion criteria, with no outliers beyond ±3.29 and skewness and kurtosis within accepted limits (Hair et al., 2010; Tabachnick & Fidell, 2019). All variance inflation factors were below 10, indicating no multicollinearity. The sample is dominated by owner-managers of micro and small firms located in Almaty. Most respondents are male (71.3%), aged 26–45 (83.3%), and educated to bachelor's level or above (86.0%); three-quarters (75.3%) are owners or founders. Micro and small enterprises account for 90.7% of firms, 68.0% of which are based in Almaty, and the leading industries are information technology (38.7%), hospitality (20.7%), and manufacturing (12.7%). Table 2 reports the full profile.

Table 2. Profile of the realised sample (n = 150).

Characteristic / Category	n	%
Gender		
Male	107	71.3
Female	43	28.7
Age group		
18–25	6	4.0
26–35	57	38.0
36–45	68	45.3
46–55	16	10.7
56–65	3	2.0
Education		
Vocational	9	6.0
Bachelor’s	72	48.0
Master’s	46	30.7
Doctoral	11	7.3
Other	12	8.0
Position		
Owner / Founder	113	75.3
General Manager / CEO	9	6.0
Senior Manager	16	10.7
Middle Manager	7	4.7
Other	5	3.3

Characteristic / Category	n	%
Firm size		
Micro (1–9 employees)	94	62.7
Small (10–49 employees)	42	28.0
Medium (50–249 employees)	14	9.3
Firm age		
Less than 1 year	2	1.3
1–3 years	27	18.0
4–5 years	37	24.7
6–10 years	43	28.7
More than 10 years	41	27.3
Region		
Almaty city	102	68.0
Astana city	19	12.7
Shymkent city	2	1.3
Other region	27	18.0
Industry		
Information Technology / Software	58	38.7
Hospitality	31	20.7
Manufacturing	19	12.7
Education	12	8.0
Professional Services	7	4.7
Construction	6	4.0
Healthcare	6	4.0
Wholesale / Retail Trade	4	2.7
Transportation / Logistics	3	2.0
Agriculture	1	0.7
Other	3	2.0
Export orientation		
Yes, significant (>25%)	13	8.7
Yes, minor (<25%)	36	24.0
No, domestic only	101	67.3

4.2 Descriptive Statistics, Reliability, and Correlations

All five composite scales exceeded the 0.70 reliability threshold (Nunnally & Bernstein, 1994): MIG = 0.748, MID = 0.713, MRE = 0.773, MCI = 0.773, and MSP = 0.830, indicating

internal consistency ranging from adequate to good. On the seven-point scales, the MARKOR dimensions and competitive intensity all exceeded the midpoint, with responsiveness highest (M = 5.06). SME performance, measured on a five-point comparative scale, averaged 3.37, slightly above its midpoint. The three MARKOR dimensions correlate positively and significantly with one another and with SME performance, whereas competitive intensity is weakly and non-significantly correlated with performance (r = −0.085, ns), an early indication that competitive pressure alone does not improve performance in this sample. Table 3 reports the full results.

Table 3. Means, standard deviations, reliability, and correlations among study variables (n = 150).

Variable	Items	α	Mean	SD	MIG	MID	MRE	MCI	MSP
MIG	4	.748	4.97	1.12	1				
MID	4	.713	4.91	1.10	.614**	1			
MRE	5	.773	5.06	0.96	.505**	.651**	1		
MCI	5	.773	4.90	1.06	.167*	.214**	.309**	1	
MSP	6	.830	3.37	0.62	.249**	.322**	.321**	−.085	1

Note. MIG = Intelligence Generation; MID = Intelligence Dissemination; MRE = Responsiveness; MCI = Competitive Intensity; MSP = SME Performance. * $p < 0.05$, ** $p < 0.01$ (two-tailed).

4.3 Hypothesis Testing

The six hypotheses were tested through three hierarchical regression models, one per MARKOR dimension. All three direct-effect hypotheses are supported. Intelligence generation has a significant positive effect on SME performance ($\beta = 0.148$, $t = 3.32$, $p < 0.001$), supporting H1; intelligence dissemination has a stronger effect ($\beta = 0.196$, $t = 4.42$, $p < 0.001$), supporting H2; and responsiveness has the strongest effect ($\beta = 0.242$, $t = 4.51$, $p < 0.001$), supporting H3. In each model, by contrast, the interaction term with competitive intensity is non-significant (H1a: $\beta = 0.008$, $p = 0.858$; H2a: $\beta = 0.053$, $p = 0.221$; H3a: $\beta = 0.018$, $p = 0.716$), and adding it did not materially increase explained variance. None of the three moderation hypotheses is supported. Table 4 reports the results.

Table 4. Hierarchical multiple regression results (n = 150).

Hypothesis	Path	R	R^2	F	β (t-value)	p-value	Result
Model 1	**MIG & MCI on MSP**	**.281**	**.079**	**4.107**			
H1	MIG → MSP				0.148 (3.32)	.001***	Supported
H1a	MIG × MCI → MSP				0.008 (0.18)	.858 ns	Rejected
Model 2	**MID & MCI on MSP**	**.371**	**.138**	**7.683**			

Hypothesis	Path	R	R^2	F	β (t-value)	p-value	Result
H2	MID → MSP				0.196 (4.42)	.001***	Supported
H2a	MID × MCI → MSP				0.053 (1.23)	.221 ns	Rejected
Model 3	**MRE & MCI on MSP**	**.372**	**.138**	**7.694**			
H3	MRE → MSP				0.242 (4.51)	.001***	Supported
H3a	MRE × MCI → MSP				0.018 (0.36)	.716 ns	Rejected

Note. Standardised coefficients (β) reported with t-values in parentheses. *** $p < 0.001$; ns = not significant. Abbreviations as in Table 3.

4.4 Interaction Effects

Simple-slope plots were constructed for each model at low (−1 SD) and high (+1 SD) levels of competitive intensity (Figures 2–4). In all three cases the two lines are nearly parallel, with very similar slopes under low and high competitive intensity, consistent with the non-significant interaction terms and confirming the absence of moderation. The small vertical separation between the lines reflects the weak negative direct effect of competitive intensity on performance also observed in the bivariate correlation ($r = -0.085$, ns): higher competitive pressure is associated with slightly lower performance overall, independent of market orientation, though this direct effect is itself not significant.

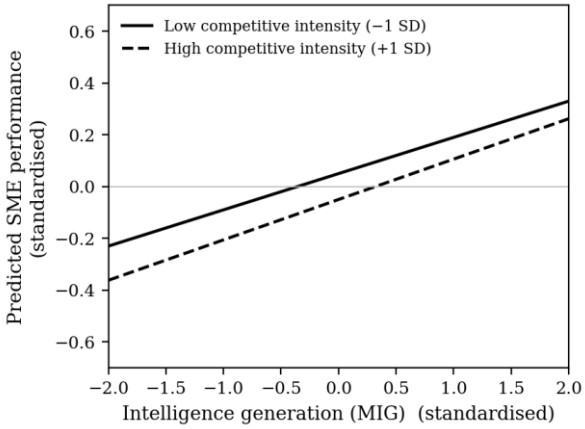


Figure 2. Interaction plot for the MIG–MSP relationship.

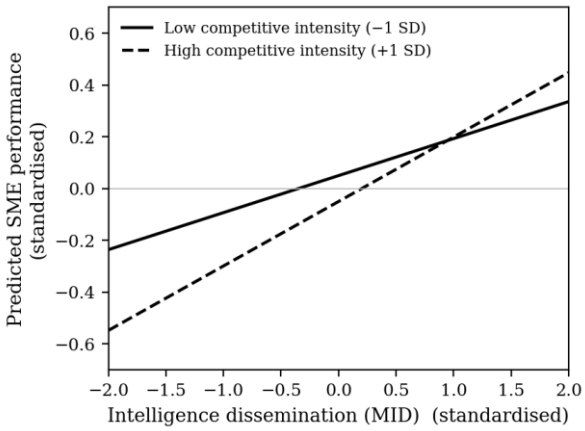


Figure 3. Interaction plot for the MID–MSP relationship.

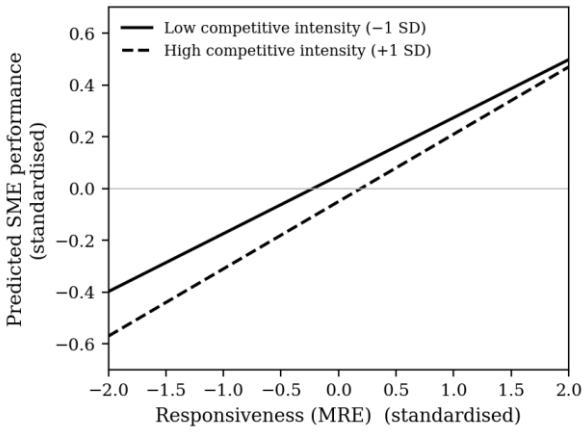


Figure 4. Interaction plot for the MRE–MSP relationship.

4.5 Summary of Hypothesis Testing

The pattern is consistent: all three direct-effect hypotheses are supported, while none of the moderation hypotheses is. Market orientation contributes to SME performance independently of competitive intensity. Table 5 summarises the outcomes.

Table 5. Summary of hypothesis testing outcomes.

Hypothesis	Statement	β (p)	Outcome
H1	Intelligence generation positively influences SME performance.	0.148 (.001)	Supported
H2	Intelligence dissemination positively influences SME performance.	0.196 (.001)	Supported
H3	Responsiveness positively influences SME performance.	0.242 (.001)	Supported
H1a	Competitive intensity moderates the MIG–MSP relationship.	0.008 (.858)	Rejected
H2a	Competitive intensity moderates the MID–MSP relationship.	0.053 (.221)	Rejected

Hypothesis	Statement	β (p)	Outcome
H3a	Competitive intensity moderates the MRE–MSP relationship.	0.018 (.716)	Rejected

Note. Abbreviations as in Table 3.

5 DISCUSSION

5.1 Direct Effects and the Capability Hierarchy

All three MARKOR dimensions positively and significantly influence SME performance, confirming the robustness of the market orientation–performance relationship (Kirca et al., 2005) in the previously unexamined Central Asian context. The ordering of effect sizes is theoretically significant: responsiveness (β = 0.242) exceeds intelligence dissemination (β = 0.196), which in turn exceeds intelligence generation (β = 0.148). This sequence corresponds precisely to the transforming–seizing–sensing hierarchy of the Dynamic Capabilities Framework, in which the transforming capability—acting on intelligence—creates the most value in volatile environments (Teece, 2007). The finding provides empirical support for interpreting market orientation as a marketing-domain manifestation of dynamic capabilities (Morgan, 2012) and illustrates a basic principle of value creation: firms derive performance not from information itself but from the actions taken on it. Intelligence generation is necessary but not sufficient; its value is realised only as it feeds into dissemination and, above all, responsiveness.

5.2 The Absence of Moderation

Contrary to the contingency prediction (Jaworski & Kohli, 1993), competitive intensity did not moderate any of the three relationships; the interaction slopes are effectively flat and the simple-slope plots nearly parallel. This null result is itself informative and admits three non-exclusive explanations. The first is substantive: market orientation may be a context-independent capability whose benefits do not depend on competitive conditions, consistent with meta-analytic evidence that environmental moderators exert weak and inconsistent effects (Kirca et al., 2005). The second is methodological: detecting interaction effects requires substantially larger samples than detecting main effects, often several hundred cases (Aiken & West, 1991; Cohen et al., 2003), whereas the present sample is n = 150, so a small true moderation effect may lie below the threshold of detectability. The third is contextual: competitive-intensity scores were concentrated in the moderate-to-high range (M = 4.90, SD = 1.06), a restriction of range characteristic of volatile emerging markets that limits the contrast against which moderation can be detected. Whichever combination obtains, the substantive conclusion is the same: in this sample, market orientation operates as a stable strategic capability whose performance benefits do not vary observably with competitive intensity.

5.3 Implications for Theory

The study makes three theoretical contributions. First, it provides direct empirical support for the alignment between market orientation and dynamic capabilities by showing that effect sizes increase along the sensing–seizing–transforming sequence, reinforcing the view of market orientation as a marketing-domain capability (Day, 2011; Morgan, 2012; Hou & Chien, 2010). Second, it adds to the long-running debate on the contingency model: the consistent absence of moderation, here and across prior studies (Slater & Narver, 1994; Liu et al., 2003; Kirca et al., 2005; Keelson et al., 2024), suggests that market orientation is better understood as a broadly

beneficial capability than as a context-sensitive one. Third, it extends the geographical and institutional scope of the literature by providing the first empirical test of the market orientation–performance relationship among Kazakhstani SMEs, establishing a foundation for comparative work across Central Asia and the wider post-Soviet space.

5.4 Implications for Practice and Policy

For SME managers, the central implication is that responsiveness, not information gathering, is the principal performance lever. When allocating scarce time and resources across collecting, sharing, and acting on market intelligence, firms should prioritise the capacity to act—adjusting products, prices, communication, and strategy quickly. Dissemination is the second priority, since intelligence concentrated in a single individual or department produces limited value; generation, though it yields the smallest direct effect, remains the indispensable foundation of the sequence. The absence of moderation means that market-oriented behaviour is worthwhile irrespective of competitive conditions, so adopting it as a standing element of strategy is consistently justified.

For policymakers and SME-support organisations, the findings suggest reorienting capability-building programmes away from information supply—reports, databases, and research subsidies—towards strengthening responsiveness through process improvement, cross-functional coordination, rapid prototyping, and change management. Because the benefits do not depend on competitive intensity, such programmes can be designed inclusively across sectors rather than targeted at firms in highly competitive markets. The study also offers a validated bilingual English–Russian instrument that institutions such as the Atameken National Chamber of Entrepreneurs or the Bureau of National Statistics could use to monitor the adoption of market-oriented practices among SMEs over time.

6 CONCLUSION

This study examined the relationship between market orientation and SME performance in Kazakhstan through the Dynamic Capabilities Framework and the contingency perspective, testing six hypotheses on data from 150 SMEs. All three direct-effect hypotheses were supported: intelligence generation, intelligence dissemination, and responsiveness each positively influence SME performance, with responsiveness the strongest predictor—an ordering that matches the transforming–seizing–sensing hierarchy of the Dynamic Capabilities Framework. None of the moderation hypotheses was supported, indicating that the performance benefits of market orientation are broadly available regardless of competitive intensity. The practical message is straightforward: SMEs should go beyond collecting market information and concentrate on using it and responding quickly to opportunities and threats, treating the three MARKOR dimensions as a sequential capability whose overall effectiveness depends on its weakest link.

Several limitations qualify these conclusions and define directions for future research. The cross-sectional design precludes strong causal inference and cannot rule out reverse causality; longitudinal designs with at least two waves are needed to establish temporal order. The sample ($n = 150$) is adequate for direct effects but limited for detecting interactions, so larger samples would provide more powerful tests of moderation. Industry concentration—nearly 60 percent of firms in IT and hospitality—and the single-country, single-informant design constrain generalisability and raise the possibility of common method variance, despite the procedural controls applied. Future research could pursue larger and stratified samples, multi-informant designs, cross-country comparisons across Central Asia, and additional moderators such as technological turbulence and institutional conditions.

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Preliminary Research on Central Asia's post-2022 Economic Diplomacy from a Regionalist Perspective

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Abstract

This research project examines whether evolving regional economic structures in Central Asia can generate sustained external economic agency in the context of post-2022 trade reconfigurations. It starts from the observation that recent disruptions to Eurasian connectivity, combined with shifting trade and infrastructure dynamics, have increased the strategic relevance of Central Asia as an economic space. Rather than treating regionalism only as a reactive or externally driven process, the project asks whether it may also serve as a structuring framework for outward-oriented economic diplomacy. The analysis is grounded in an International Political Economy perspective and combines rationalist institutionalism with developmental regionalism, especially Public Goods Regionalism, in order to assess how regional trade, infrastructure, and coordination mechanisms may condition states' bargaining capacity and external room for manoeuvre. The project outlines an inductive and theory-informed methodology that brings together descriptive quantitative evidence on trade and connectivity with qualitative analysis of policy documents and regional cooperation formats. For that and for data accessibility purposes, it eventually aims to focus primarily on Kazakhstan and Uzbekistan. The paper does not seek to provide a final empirical conclusion, but rather to establish the conceptual and methodological foundations for further research into Central Asia's economic diplomacy and regional agency.

1. Introduction

Since 2022, Central Asia has undergone a dramatic reconfiguration of its external economic relations. The disruption of northbound trade routes through Russia, combined with mounting pressure on transit infrastructure and intensified competition over transcontinental corridors, has elevated the region from a geopolitical periphery to a contested node in Eurasian connectivity. Traditional trade flows have been rerouted, alternative corridors linking Asia to Europe via the Caspian and South Caucasus have gained strategic salience, and regional governments have accelerated efforts to coordinate transport policies, reduce border bottlenecks, and expand logistics capacity. Kazakhstan and Uzbekistan, the region's two largest economies, have not only diversified their trade partnerships but have deepened bilateral and multilateral coordination on infrastructure development, customs procedures, and connectivity frameworks. These developments point to something more than reactive adjustment to external shocks – they raise questions about how states navigate external dependence and whether collective action at the regional level may expand their room for manoeuvre.

The reconfiguration of global economic relations in recent years has renewed scholarly attention to the role of regions in structuring states' external economic engagement. While globalization long promised the progressive erosion of boundaries between domestic and international economic policy, recent disruptions in trade, finance, and logistics have reasserted the importance of regional configurations as mediating spaces within the international political

economy (Lucia, 2019). Far from being mere institutional shells, regional arrangements increasingly appear as material and functional frameworks through which states organize access to markets, infrastructure, and strategic resources. This shift is particularly visible in contexts historically characterized by weak institutionalization or strong external dependence. In such settings, regional dynamics have often been analyzed through the lenses of fragmentation, informality, or geopolitical competition, with limited attention paid to their potential structuring effects on economic action. Yet evolving patterns of coordination – particularly in domains such as connectivity, trade facilitation, and infrastructure development – suggest that regionalism may play a more significant role in shaping states' external economic strategies than previously assumed. Rather than treating regionalism only as a reactive or externally driven process, it may also serve as a structuring framework for outward-oriented economic diplomacy.

This question carries particular analytical weight for International Political Economy (IPE), where the relationship between regional structures and states' external economic strategies remains undertheorized, especially in contexts that depart from standard templates of European integration or East Asian developmentalism. Central Asia illustrates this dynamic in particularly sharp terms. Historically analyzed through the lenses of geopolitical competition, external dependence, and institutional fragility (Pomfret, 2009; Cooley, 2013), the region has long been treated as a space where regional cooperation is either absent, performative, or subordinated to the interests of external powers. Existing scholarship has overwhelmingly emphasized centrifugal forces: rivalry over water and energy resources, divergent political trajectories, and the competitive overlay of Russian, Chinese, and increasingly Western and Turkish influence (Laruelle and Peyrouse, 2013; Tskhay and Costa Buranelli, 2020); Where regional institutions have been examined, they have typically been interpreted either as vehicles for external strategic projection or as hollow frameworks lacking substantive economic content (Bourdais Park, 2025). The dominant analytical framing has thus been one in which regionalism functions primarily as an externally driven or geopolitically reactive process, rather than as a structure capable of generating autonomous economic agency.

Yet this framing sits uneasily with recent empirical developments. The acceleration of regional coordination on transport and logistics, the proliferation of bilateral and trilateral agreements on transit facilitation, the expansion of digital customs platforms, and the visible intensification of presidential-level diplomacy around infrastructure connectivity suggest that something more consequential may be underway. These involve tangible resource commitments, institutional adjustments, and shifts in domestic regulatory architecture, occurring precisely at a moment when external dependencies (particularly on Russian transit routes and markets) have become more costly and uncertain. The question, then, is whether these developments represent a meaningful reconfiguration of the region's economic structure, one that expands the room for manoeuvre of regional states in their external economic relations, or whether they remain epiphenomenal adjustments that will dissipate once external pressures recede.

To address this question, the study draws on two bodies of theory within International Political Economy: rationalist institutionalism and developmental regionalism, with particular emphasis on Public Goods Regionalism. Rationalist institutionalism has long examined how regional institutions reduce transaction costs, facilitate credible commitments, and enable cooperation among states with divergent preferences (Keohane and Martin, 1995; Farrell and Héritier, 2005). However, it has historically focused on relatively formalized, rule-bound settings and has less to say about contexts where institutions are weakly formalized and where external dependencies structure the baseline conditions for cooperation. Public Goods Regionalism, as articulated by scholars such as Nesadurai (2022) and further developed in work on infrastructure-

led integration (Chauffour and Maur, 2011; Cirera and Winters, 2015), emphasises the collective provision of regional public goods, such as transport infrastructure, energy networks, regulatory harmonisation, as a mechanism for expanding states' productive capacities and external economic reach. By pooling resources to address shared infrastructure deficits and creating network effects that lower the marginal cost of connectivity, states can enhance their capacity to engage external markets on more favorable terms. Crucially, this framework does not assume deep political integration; it is compatible with transactional cooperation driven by functional economic imperatives.

The combination of these frameworks provides a productive analytical lens for examining Central Asia. Together, they suggest a hypothesis: that regional economic structures, even in settings of weak institutionalization, may function as enabling conditions for external economic agency, provided that they generate tangible public goods that alter the baseline constraints facing individual states. Yet the implications of these frameworks for understanding economic diplomacy and bargaining capacity in weakly institutionalized or externally dependent regions remain insufficiently explored. If regionalism is nonetheless emerging as a structuring framework for external economic strategy in Central Asia, it would represent a theoretically significant case: one that challenges the scope conditions typically associated with functionalist or developmental theories of regional cooperation.

This is the puzzle at the heart of this study. It asks whether recent developments in trade, connectivity, and regional coordination are expanding Central Asian states' bargaining capacity and external room for manoeuvre, and whether regionalism may serve as a structuring framework for economic diplomacy rather than merely reflecting external pressures. The analytical focus rests primarily on Kazakhstan and Uzbekistan, the region's two largest economies and the most actively engaged in regional coordination, both for reasons of analytical tractability and data accessibility. The study adopts an inductive, theoretically informed methodology, bringing together descriptive quantitative evidence on trade flows, connectivity patterns, and infrastructure investment with qualitative analysis of policy documents and regional cooperation formats. Crucially, this paper does not seek to advance a definitive empirical conclusion. Its ambition is more foundational: to establish the conceptual and methodological scaffolding for a broader research agenda into Central Asia's economic diplomacy and the conditions under which regional structures may generate sustained external agency.

2. Literature Review

One cannot, when attempting to discuss Central Asia’s - excluding Turkmenistan - approach to globalisation and international trade, avoid reference to multi-vectorism. Whether posited as the State’s official foreign policy doctrine (President of the Republic of Kazakhstan, 2020; President of the Kyrgyz Republic, 2019), reflected in the region through commitments to “balanced” and diversified external engagement (Ministry of Foreign Affairs of the Republic of Uzbekistan, 2025; Kadyrov, 2020; Sotiboldiev, 2024[24]), or less explicitly articulated through open and non-exclusive foreign policy orientations aimed at broadening international partnerships (President of the Republic of Tajikistan, 2015), this concept, first introduced in official discourse by Nursultan Nazarbayev in 1992 (Nazarbayev, 1992), and extensively discussed in the IR literature, has remained a defining feature of the region’s external positioning. From a globalisation perspective, the underlying logic of non-aligned, multi-partner engagement remains central; in

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Central Asia this logic has been expressed through a strategic alternative to the institutionalisation of regional ties (Lewis, 2018), a financial security tool guaranteeing multiple and non exclusive Foreign Direct Investments (FDIs) sources (Tripathi and Karlekar, 2024), or a reactive political statement to the beginning of Russia's war against Ukraine,

While multi-vectorism captures the strategic orientation of Central Asian states towards diversified external engagement, it remains primarily focused on foreign policy at the state level and offers limited engagement with the regional economic structures within which these strategies are embedded. In this respect, regionalisation processes constitute a critical dimension shaping the scope and durability of these external engagements.

2.1. Regionalisation, Regionalism and New Regionalism

Scholarship on regionalism in Central Asia has been structured by a persistent tension between interpretations emphasising structural weakness and those seeking to identify more flexible, and often informal, forms of regional coordination. Early contributions foregrounded the limited institutionalisation of the region, frequently attributing this to divergent state-building trajectories, elite fragmentation, and the absence of a cohesive regional project (Bohr, 2004). Within this perspective, regionalism is not absent but remains shallow, episodic, and largely subordinate to domestic political configurations. This reading has been reinforced by analyses that conceptualise Central Asia as a space of externally guided regionalism, in which regional dynamics are shaped less by endogenous integration than by the projection of competing external frameworks – whether driven by Russia, China, the United States, or other actors – thereby constraining the emergence of autonomous regional governance structures (Macfarlane, 2004). Such approaches tend to displace the locus of regionalism beyond the region itself, framing Central Asia as an object rather than a subject of regional ordering.

At the same time, a parallel strand of scholarship has sought to reintroduce agency into this picture by focusing on the role of domestic elites in structuring both regional and external engagements. The work of Alexander Cooley is central in this regard. In *Great Games, Local Rules*, he demonstrates that Central Asian governments have been capable of shaping the terms of engagement with external powers, effectively compelling them to operate within locally defined, if often informal and clientelistic, rules (Cooley, 2012). While this perspective marked an important shift away from purely structural accounts, it simultaneously circumscribes regional agency by locating it primarily in informal practices and elite-level strategies, rather than in durable regional configurations. As a result, the scope of regionalism remains analytically tied to contingent and often self-serving forms of coordination, limiting its conceptualisation as a basis for sustained collective action.

A shift has been observed since 2016 in the region's approach to great power competition, with the emergence of 'balancing regionalism' as a dominant strategy (Tskhay and Costa Buranelli, 2020), rooted in the pursuit of collective ontological security – the need to secure a shared identity and legitimacy for the ruling regimes, both domestically and regionally. Balancing regionalism is framed as "countering a neighbouring country's aggressive foreign policy not by directly balancing it militarily or economically, but rather by acting on a number of regional organisations […] that help relax ties and obligations towards that preponderant state" (Tskhay and Costa Buranelli, 2020, p. 3). This strategy has emerged in response to Moscow's annexation of Crimea in 2014 and its broader revisionist agenda, as an alternative to dependence on Russia, creating an increasingly independent regional order. Kazakhstan, for example, deepened its engagement with Turkey and China, while Uzbekistan began a gradual reorientation under Shavkat Mirziyoyev, emphasising multilateralism and economic diversification.

More recent contributions have attempted to move beyond the endogenous/exogenous dichotomy by conceptualising Central Asian regionalism as a form of adaptive or "balancing" practice, in which intra-regional cooperation emerges not through deep institutionalisation but through flexible, situational alignments shaped by shifting external pressures and converging elite interests (Mikhaylenko and Suhrob, 2020). This perspective aligns with broader approaches within the "new regionalism" literature, which define regionalism less in terms of formal integration and more as a political project involving varying degrees of coordination, solidarity, and governance across multiple domains (Bourdais Park, 2025). Within this framework, the absence of deep institutionalisation does not preclude the existence of regionalism, but rather redefines it as a looser, processual, and often selective form of cooperation. Nevertheless, even within these more nuanced accounts, Central Asia continues to be approached as a structurally constrained regional space, in which regionalism remains contingent upon elite convergence, externally conditioned, and limited in its capacity to generate stable, autonomous forms of collective governance.

Across these strands, a common analytical tendency persists: regionalism in Central Asia is either treated as weak and underdeveloped, as externally driven, or as reducible to informal and elite-mediated practices. What remains less developed is an account of regionalism as a potentially structuring framework capable of underpinning sustained and outward-oriented economic strategies, particularly in the domain of international trade and economic diplomacy. The notion of "balancing regionalism" appears increasingly insufficient to account for the recent evolution of regional dynamics in Central Asia. While this framework has been analytically valuable in explaining patterns of coordination as reactive strategies to external pressures – particularly in terms of regime security and ontological positioning – it does not fully capture the extent to which regional cooperation has become more internally driven and structurally embedded. The multiplication of regionally initiated platforms (such as the Astana Process, the Consultative Meetings of Central Asian Leaders, and a growing number of sector-specific ministerial formats (transport, ecology, digitalisation)) illustrates that regional diplomacy is increasingly convened and structured by Central Asian actors themselves.

In this context, Boyka Stefanova proposes a reconceptualisation of regionalism in Central Asia through the notion of an "expanding regional developmental network" (Stefanova, 2025, p. 19) understood as a flexible and evolving framework within which intra-regional coordination and external engagement are articulated. This approach shifts the analytical focus from balancing behaviour to the gradual consolidation of regionally grounded developmental logics, in which cooperation is not merely a response to competing external projects but a mechanism for structuring them. External partnerships are thus increasingly filtered through regionally defined priorities, rather than constituting their primary drivers. Central Asia is transitioning from a fragmented space of competing external influences toward a consolidated model of "hedging regionalism". While historically defined by Russia's declining hegemony and China's developmental regionalism via the Belt and Road Initiative, the Central Asian states (CAS) are increasingly exercising political agency to coordinate their collective interests. Key evidence of this emerging regionalism includes the Consultative Meetings of the Heads of State, which provide a unique mechanism for indigenous political dialogue, and the development of the Middle Corridor (TITR). By reconceptualising transit links as economic corridors intended to generate local value and global interconnectedness, the CAS are attempting to transform their logistical position into a tool for domestic growth. Ultimately, Stefanova concludes that while the "open" nature of these projects prevents full autonomous consolidation, Central Asia is successfully leveraging geoeconomic competition to establish itself as a subject of its own regional ordering (Bonacker and Lottholz, 2022; Stefanova, 2025).

This is where insights from Per Högselius (2021) on "hidden integration" become particularly useful. His work highlights the existence of dense yet low-visibility forms of cooperation that operate beneath the level of formal institutions, including infrastructural interdependencies, technical standardisation, and routine bureaucratic coordination. In the Central Asian context, sectors such as energy, transport, water management, and customs administration have long exhibited forms of de facto integration, even in the absence of formal political unity. What appears to have shifted in the post-2022 period is the functional role of these embedded linkages: rather than remaining confined to domestic or regional management, they increasingly underpin the region's external economic engagement. In this sense, technical integration becomes a resource for diplomacy. This transformation is closely tied to the structural characteristics of governance in Central Asia. Highly centralised, executive-driven political systems enable the rapid implementation of technical and procedural reforms, often without the constraints associated with pluralistic decision-making. Instruments such as digital customs platforms, simplified inspection regimes, and Single Trade Windows can therefore be deployed efficiently and replicated across sectors. Precisely because these mechanisms are sovereignty-preserving, technocratic, and low in political conditionality, they generate transferable governance templates that external partners, particularly in the context of emerging Eurasian trade corridors, find both predictable and attractive. As a result, regional cooperation is no longer only a means of managing external influence but increasingly constitutes the basis upon which external economic diplomacy is conducted.

This shift also invites a distinction between regionalism as a political and strategic project, and regionalisation as the set of material and functional processes through which cross-border interactions become routinised and structurally embedded (Hettne and Söderbaum, 2000). While the former has often been characterised as limited in the Central Asian context, the latter draws attention to the gradual consolidation of trade corridors, infrastructural linkages, and sector-specific cooperation frameworks that operate beyond formal institutionalisation

2.2. Economic Diplomacy

Complementing these approaches, the literature on economic diplomacy provides a conceptual lens through which to examine how states organise and pursue their external economic relations. As argued by Bayne and Woolcock (2012), the expansion of global economic interdependence has progressively blurred the distinction between domestic and international policy-making, requiring governments to manage complex interactions between political and economic objectives, internal and external pressures, and a widening range of actors. Within this framework, regional groupings can facilitate economic engagement, as liberalisation is often more politically viable when embedded in arrangements characterised by comparable levels of development and converging policy preferences. At the same time, scholarship focusing on emerging economies emphasises the strategic dimension of economic diplomacy, highlighting the need to balance offensive and defensive interests, secure reciprocal partnerships, and mitigate the risks of dependency in relations with more established economic powers (Chatterjee, 2020). In this context, economic diplomacy is closely tied to the notion of bargaining power, understood not as coercive capacity but as the ability to negotiate favourable terms through the alignment of domestic priorities, external opportunities, and partner-specific constraints. Economic diplomacy is thus generally conceptualised as a state-led process through which governments seek to expand their external economic room for manoeuvre under conditions of asymmetric interdependence.

<u>The literature gap:</u>

These approaches remain predominantly state-centric and tend to assume a relatively coherent and strategically articulated external economic policy. They pay more limited attention to contexts in which economic engagement is structured through regionally embedded configurations, shared infrastructures, and partially coordinated policy frameworks. This limitation is particularly salient in Central Asia, where evolving regional economic structures – intensified by the reconfiguration of trade routes and partnerships following 2022 – raise the question of whether such dynamics can sustain forms of external economic agency beyond fragmented or reactive strategies.

3. Research question and Theoretical framework

3.1. Theoretical Framework: Developmental Rationalist-Institutionalism

The evolution of economic regionalism in Central Asia is best analysed through a Rationalist-Institutionalist framework situated within the school of Developmental Regionalism. This two-tiered approach assumes that state actors are self-interested players who construct policy preferences within the constraints of both formal and informal domestic institutions. Unlike Western liberal models focused solely on trade liberalisation, this framework conceptualises regionalism as a state-directed intervention designed to generate the "spatial conditions of production", such as infrastructure, energy grids, and technical standards, deemed vital for structural economic transformation (Nesadurai, 2022).

The framework operates on the interplay of two primary interest groups:

1. Public (National) Interests: Actors seek to maximise economic welfare, ensure energy security, and mitigate external threats to territorial integrity. In the Central Asian context, this includes “Holding Together Integration” (HTI), where states coordinate to minimise the disintegration costs of Soviet-era functional linkages.
2. Private (Elite) Interests: Decisions are shaped by the political leadership’s need for political survival (holding office), rent-generation from state resources, and the desire to leave a positive legacy (prestige).

Integration occurs only when these public and private interests align, particularly when a regional hegemon offers subsidies or security guarantees that offset the domestic costs of opening markets.

This framework (rationalis institutionalist), situated within an International Political Economy (IPE) perspective, proceeds from the assumption that states, understood as strategic and interest-driven actors, operate within institutional and structural constraints that shape their economic interactions; constraints including not only formal regional organisations, but also evolving configurations of trade flows, infrastructure, and policy coordination mechanisms that structure economic opportunities.

This approach draws methodological inspiration from Baitimbetova (2024), whose research examines patterns of regional integration in Central Asia by analysing how state preferences, sectoral interests, and institutional constraints shape the selection of cooperation frameworks. Her study focuses in particular on how Kazakh and Kyrgyz governments navigate overlapping regional initiatives, such as those associated with the Eurasian Economic Union and China’s Belt and Road Initiative, by aligning their integration choices with domestic economic priorities and political considerations. Within a rationalist institutionalist framework, she conceptualises regionalism as the outcome of preference aggregation under institutional constraints, with particular attention to the interaction between public and private interests.

While retaining a similar epistemological grounding and an inductive, theoretically informed research design, the present study departs from this approach both in its analytical focus and empirical object. Rather than examining how preferences are formed or how states select between competing regional frameworks, it shifts attention to the regional structural conditions under which economic agency is exercised. In other words, instead of explaining choices of integration, it seeks to understand how evolving regional economic configurations shape the capacity of states to act externally, particularly in the domain of trade and economic diplomacy. To capture this shift, the framework integrates insights from developmental regionalism, and more specifically its variant often referred to as Public Goods Regionalism. This perspective conceptualises regional cooperation not primarily as a process of market integration or institutional harmonisation, but as the joint provision of regional public goods – such as transport corridors, energy connectivity, trade facilitation mechanisms, and regulatory coordination – that reduce transaction costs and enable participation in global markets (Nesadurai, 2022). From this standpoint, regionalism is understood as a functional and materially grounded process, through which states collectively construct the infrastructural and regulatory conditions necessary for economic development and external engagement. The illiberal dimension of this 'collectivity' in a Central Asian context will be part of an extensive discussion.

Building on these foundations, the analytical framework proceeds inductively. It first specifies the concept of external economic agency, with particular attention to its articulation in terms of bargaining capacity under conditions of asymmetric interdependence. For Central Asian states, this involves utilising technical integration and geoeconomic positioning (as landlocked transit hubs) as resources for diplomacy to extract concessions from regional hegemons. It then conceptualises regional economic structures as configurations of material, infrastructural, and institutional arrangements. Finally, it develops a set of theoretically informed expectations regarding the relationship between these structures and the exercise of economic diplomacy, allowing for an empirical assessment of whether recent transformations in Central Asia's regional economic landscape constitute a meaningful shift in states' capacity to act within the international economic system.

3.2. Research question

To what extent do evolving regional economic structures in Central Asia, in the context of post-2022 trade reconfigurations, enhance the capacity of states to exercise external economic agency?

Sub-questions: What forms of regional economic structuring have emerged or intensified in Central Asia since 2022? Through which mechanisms can these structures translate into increased bargaining capacity in external economic relations? To what extent do these developments move beyond reactive or fragmented strategies toward more sustained forms of economic diplomacy?

3.3. Variable Definitions and Operationalization

Variable 1: Regionalism in Central Asia

- Institutional Depth vs. Flexibility: Measured by the presence of supranational bodies and the nature of decision-making (consensus vs. delegation).
- Functional Transaction Rates: Measured through the volume of intra-regional trade, shared use of energy/water infrastructure (e.g., parallel operation of energy systems), and labor migration flows.

- Regulatory Harmonisation ("Hidden Integration"): Measured by the degree of technical standardisation and mutual recognition of "behind-the-border" policies (e.g., customs administration, phytosanitary standards).

Variable 2: Economic Diplomacy

- Bargaining Concessions: Measured by the value of financial grants, loan forgiveness, debt write-offs, and subsidised strategic inputs (e.g., duty-free oil and gas) secured through regional membership.
- Multi-vector Alignment (Hedging Index): Measured by the distribution of strategic agreements across competing poles (e.g., energy pipelines to China vs. security treaties with Russia) to avoid exclusive alignments.
- Infrastructure Connectivity Projects: Measured by the number and scale of regional projects secured that serve the domestic economy (e.g., the Middle Corridor, the Kyrgyz-Russian Development Fund)

4. Empirical Background

Several empirical developments illustrate the material nature of this shift. First, trade patterns have shown signs of rapid reorientation. Kazakhstan's exports to the European Union increased markedly in 2022-2023, largely driven by energy but also accompanied by efforts to expand non-resource exports, while its trade with Russia became more complex due to re-export dynamics and compliance pressures. Uzbekistan, for its part, has intensified trade relations with both regional neighbours and non-traditional partners, including Türkiye and the Gulf states, while simultaneously promoting export diversification through state-led industrial policy. These shifts point not only to changing external alignments, but also to attempts by Central Asian states to reposition themselves within global trade networks.

Second, infrastructure and connectivity have emerged as central pillars of regional economic coordination. The development of the Trans-Caspian International Transport Route ("Middle Corridor") has accelerated significantly since 2022, with increased freight volumes passing through Kazakhstan, the Caspian Sea, and the South Caucasus toward European markets. Investments in rail modernisation, port capacity (notably in Aktau and Kuryk), and customs digitalisation have been supported by external actors such as the European Bank for Reconstruction and Development and the Asian Development Bank, but are increasingly embedded in national and regional policy agendas. These developments reflect a shift toward the joint provision of connectivity-related public goods, consistent with a developmental regionalism logic.

Third, regional diplomatic activity has become more structured and frequent. The Consultative Meetings of Central Asian Leaders, relaunched in 2018, have gained renewed momentum in the post-2022 context, accompanied by a proliferation of sector-specific cooperation formats in areas such as transport, energy, and digitalisation. These platforms have facilitated coordination on practical issues such as border management, transit tariffs, and infrastructure planning, suggesting a move toward more regularised forms of regional economic governance. While still largely informal and state-led, these mechanisms indicate that regional cooperation is increasingly driven by internally defined priorities rather than solely by external actors.

Taken together, these developments provide preliminary evidence that Central Asia is undergoing a process of economic reconfiguration in which regional structures, particularly in trade, connectivity, and coordination, are becoming more salient. However, whether these transformations translate into a sustained capacity for external economic agency remains an open

question. It is precisely this relationship between evolving regional economic structures and the exercise of economic diplomacy that this study seeks to examine.

5. Methodology

This study adopts an inductive, theory-informed research design situated within an International Political Economy perspective. Rather than testing predetermined hypotheses, it develops analytical expectations derived from rationalist institutionalism (Baitimbetova, 2024; George and Bennett, 2005) and developmental regionalism, specifically its variant of Public Goods Regionalism, and assesses their empirical plausibility in the context of post-2022 Central Asia. The objective is not to establish causal relationships in a strictly positivist sense, but to examine whether emerging regional economic structures are associated with enhanced forms of external economic agency.

Empirically, the study relies on a structured examination of selected Central Asian cases, focusing in particular on Kazakhstan and Uzbekistan, with selective reference to other regional actors where relevant. These cases are chosen on the basis of their differing economic profiles, integration into regional and global markets, and roles in emerging connectivity frameworks such as the Middle Corridor. This variation allows for comparative insight into both structural conditions and potential expressions of economic agency.

The analysis combines quantitative and qualitative sources. Quantitative data is used descriptively to map economic capacities and sectoral agency. Indicators include bilateral trade flows, export composition, FDI patterns, and corridor usage, drawing primarily on the UN Comtrade database, World Bank, and IMF statistics. In line with Bayne and Woolcock (2012), these data allow assessment of states' ability to diversify external partnerships and leverage economic assets, providing a material basis for evaluating agency in negotiations and treaty-making. Qualitative analysis complements this approach by examining policy documents, regional agreements, and official statements on trade, connectivity, and economic cooperation. These sources reveal how states operationalise economic diplomacy, identify strategic sectors, and leverage regional configurations in their external engagements (Chatterjee, 2020).

The key concepts of the study are operationalised as follows. External economic agency is understood relationally and operationalised through: (i) sectoral concentration and diversification of trade and investment; (ii) capacity to negotiate and implement bilateral or multilateral agreements with external partners; and (iii) demonstrated influence over the structuring of regional economic projects and corridors, following Chatterjee's emphasis on bargaining power and strategic reciprocity (Chatterjee, 2020). Regional economic structures are conceptualised as the institutional, procedural, and infrastructural configurations that enable intra-regional cooperation and economic integration. They are assessed via indicators including intra-regional trade ratios, the development and management of transport corridors, digital customs platforms, Single Trade Windows, and the formalisation of ministerial or consultative cooperation formats (Högselius, 2021; Stefanova, 2025).

The analytical strategy proceeds through a structured, theory-guided examination of each case. The first stage evaluates the post-2022 evolution of economic agency at the sectoral and state level, focusing on material capacities and negotiation patterns. The second stage situates these findings within the broader regional structures, assessing whether enhanced infrastructural and procedural coordination correlates with greater leverage in external economic diplomacy. By integrating quantitative mapping with qualitative document analysis, the study captures both the

material and institutional dimensions of regional economic agency. This approach allows for an assessment of whether stronger or more functional forms of regional structuring are associated with enhanced capacities for economic diplomacy, particularly in terms of diversification, bargaining power, and sectoral leverage.

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DRIVERS OF CONSUMER CHOICE ON ONLINE PLATFORMS: A BEHAVIOURAL STUDY IN KAZAKHSTAN

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ABSTRACT

This study examines the drivers of consumer choice on online platforms in Kazakhstan, focusing on how price, payment method, delivery time, and social proof influence online purchase decisions. The research adopts a mixed-method design. In the first phase, ten semi-structured interviews were conducted with adult online shoppers to validate the relevance of the proposed attributes and refine realistic attribute levels for the quantitative survey. The qualitative findings showed that consumers consider quality, price, payment convenience, delivery speed, and ratings and reviews when selecting online offers. Card payment was identified as the dominant routine payment method, while instalments or "buy now, pay later" (BNPL) was mainly associated with higher-cost purchases. Fast delivery and strong review signals were also perceived as important trust and convenience factors.

In the second phase, an online survey was conducted among 215 respondents in Kazakhstan. The survey included repeated purchase-choice scenarios and post-choice evaluation items. The quantitative analysis showed that ratings and reviews had the strongest positive effect on consumer evaluation, followed by price and delivery. Price had a significant negative effect, indicating that higher prices reduce the attractiveness of an online offer. Delivery had a positive effect, confirming that faster delivery increases consumer preference. The payment method was statistically significant but had a weaker effect compared with other predictors. The findings suggest that consumers in Kazakhstan are not driven by price alone; instead, they evaluate online offers through a combination of economic value, trust signals, and convenience.

The study contributes to consumer behaviour research by providing empirical evidence on online platform choice in Kazakhstan, an emerging digital marketplace. It also offers practical implications for online platforms and sellers, suggesting that improving ratings, review credibility, competitive pricing, and delivery reliability may strengthen consumer trust and purchase intention.

Key words: Online consumer choice, online platforms, Kazakhstan, social proof, ratings and reviews, delivery time, payment method, BNPL, price sensitivity, consumer behaviour.

1. Introduction

1.1 Research Questions

Online platforms and marketplaces have become the dominant channel for consumer shopping in Kazakhstan. In this environment, consumers often choose between competing offers that differ not only in price but also in the purchasing terms presented on the platform, such as available payment methods, delivery speed, and social proof (ratings and reviews). For platforms

and sellers, these factors are central to conversion and customer satisfaction; however, there is limited local data on how consumers in Kazakhstan consider these attributes when making purchase decisions. Much of the existing research in emerging markets relies on stated attitudes (e. g., "trust" or "convenience" ratings) rather than observing decisions in realistic choice settings. As a result, managers and researchers often lack clear quantitative estimates of which attributes are most important in Kazakhstan, the strength of these effects, and whether different consumer segments follow different decision rules. The purpose of this study is to identify and quantify key factors influencing consumer choice on online platforms in Kazakhstan and to translate the findings into practical recommendations for platform design and seller offerings. In this way, the research questions will be:

i)Which attributes most strongly influence consumers' online purchase choices in Kazakhstan (price, payment method, delivery time, social proof)?

ii) What is the relative importance of each attribute when consumers choose between competing offers?

iii) How do consumers trade off these attributes (e. g., willingness to accept slower delivery for a lower price or better payment option)?

iv) Are there distinct segments of consumers with systematically different preference patterns (e. g., price-sensitive, convenience-driven, trust-driven)?

1.2 Research Hypotheses

In this study, there are five hypotheses that we have identified as follows:

i)H_1 (Price): A lower price will increase the probability that an option is chosen.

ii) H_2 (Payment): More convenient or more financially flexible payment options (e. g., 0% instalments, Buy Now, Pay Later (BNPL), where applicable) will increase the probability of choice relative to standard one-time payment methods.

iii) H_3 (Delivery): Faster delivery time increases the probability of choice.

iv) H_4 (Social proof): Higher ratings and higher review counts will increase choice probability.

v) H_5 (Heterogeneity): Preferences will not be uniform; consumer segments will differ in the weight they place on price, delivery, payment, and social proof.

vi) Aim: To generate theoretically grounded behavioural evidence on consumer decision-making on online platforms in Kazakhstan and derive practical recommendations for improving platform and seller offerings.

1.3 Research Objectives

In this study, we identified the following objectives:

i)Create a list of key online shopping attributes (payment, delivery, social proof) and determine the levels of each attribute for selection in the Choice-Based Conjoint (CBC).

ii) Conduct semi-structured interviews with online buyers to validate the relevance of the proposed attributes and refine realistic attribute levels.

iii) Collect quantitative choice data from adult online shoppers in Kazakhstan and estimate the contribution of each attribute to consumer choice outcomes.

iv) Identify consumer segments with different preferences (e. g., price-sensitive, delivery speed-seekers, trust-seekers) and describe their demographic and behavioural profiles.

v) Translate results into practical recommendations for platform operators, marketplaces, and sellers.

1.4 Definition of Key Terms

Online platform	A digital marketplace or online sales channel through which consumers compare and purchase products.
Social proof	Visible consumer feedback signals, including rating score and number of reviews.
BNPL	A payment option allowing consumers to purchase immediately and pay later, usually in instalments.
Choice-Based Conjoint	A survey-based method in which respondents choose among alternative product profiles with different attribute levels.

2. Literature Review

2.1 Underpinning Theories

Lancaster's Characteristics Theory. The most suitable theoretical framework for this study is a combination of Characteristic-based consumer behaviour theory and Random utility theory. First, the Characteristic-based theory of consumer behaviour, often referred to as the Lancaster Model, proposes that consumers derive utility (satisfaction) not directly from the products themselves, but from the specific characteristics or attributes they possess. This theory shifts the focus from the product to the set of attributes that comprise the product. For example, colour, taste, quality, brand image, and so on. According to Lancaster (1966), the consumer views the product being purchased as a bundle of attributes. For instance, a car has the potential for top speed, safety features, and prestige. At the same time, the presence of attributes is objective, although the consumer's attitude toward them is subjective. For example, 1,000 horsepower, or a car that accelerates from 0 to 60 mph (or 100 kph) in three seconds. Then consumers purchase products to acquire specific attributes to satisfy their own needs and this is utility from attributes. Additionally, because consumers seek specific combinations of attributes, they can purchase several different brands to achieve the "perfect" set of their needs, which explains their variety seeking. Thomsen (2026), in his work "An interactive text for food and agricultural marketing", gives a good example of the Lancaster model: The essential difference in the Lancaster model is that the consumer views a purchased good as a bundle of characteristics. For example, the consumer is not interested in a half gallon of orange juice per se. Rather he or she is interested in characteristics such as vitamin C, potassium, a sweet and tart taste sensation, carbohydrates for energy, dietary fiber, etc. The consumer could satisfy the desire for these characteristics through orange juice or through several other products. For example, grapefruit juice might provide similar micro-nutrient characteristics to orange juice but would differ in terms of the taste characteristics provided (less sweet with a slightly bitter aftertaste) and macro-nutrients (perhaps slightly fewer calories). Concord grape juice would lack the tartness of orange juice, provide a taste sensation that is more sweet, would likely contain more calories, provide more or less of certain micro-nutrients, and would provide a mouth-feel different from either orange juice or grapefruit juice. The point to be made here is that orange juice, grapefruit juice, and Concord grape juice are more than just products, they are delivery mechanisms for a variety of characteristics that the consumer may value. (p. 168)

It follows that the consumer has preferences for a product, and they can be represented by a utility function. Thomsen (2026) writes the utility function within the Lancaster model can be defined in this way:

$$U = f(c_{11}, c_{12}, c_{13}, \ldots, c_{1N}, c_{21}, c_{22}, c_{23}, \ldots, c_{2N}, \ldots, c_{M1}, c_{M2}, C_{M3}, \ldots, c_{MN}),$$

where c_{ij} is the amount of the i^{th} characteristic contained in one unit of the j^{th} purchased good, $i = 1, 2, 3, \ldots, M$ and $j = 1, 2, 3, \ldots, N$.

For example, it would be possible to identify and measure characteristics in three juice products: orange juice (Q_1), grapefruit juice (Q_2), and Concord grape juice (Q_3). Suppose, for simplicity, that consumers care only about two characteristics: sweetness (characteristic 1) and tartness (characteristic 2). In this case, the c_{ij} terms in the consumer's utility function would be interpreted as follows:

c_{11} = the amount of characteristic 1 (sweetness) in product 1 (orange juice)
c_{12} = the amount to characteristic 1 (sweetness) in product 2 (grapefruit juice)
c_{13} = the amount of characteristic 1 (sweetness) in product 3 (Concord grape juice)
c_{21} = the amount of characteristic 2 (tartness) in product 1 (orange juice)
c_{22} = the amount characteristic 2 (tartness) in product 2 (grapefruit juice)
c_{23} = the amount of characteristic 2 (tartness) in product 3 (Concord grape juice). (p. 168)

Thus, we see that the Lancaster model can be expressed using the formula above, where f is a single function, and c_1, c_2, and c_3 are different variables, characteristics within this function. For example, in terms of meaning:

$$U = f(c_1, c_2, c_3) = f(\text{price, quality, brand}),$$

where c_1 is price, c_2 is quality, and c_3 is brand.

In other words, consumer utility depends on the characteristics of the goods.

Random Utility Theory. Random utility theory is a model used in economics and psychology which assumes that individuals choose the alternative that provides the highest utility, however, this utility is not perfectly observable and contains both deterministic and random components. According to Willis (2014), a person chooses the alternative that provides the greatest utility, nevertheless, the researcher does not see the full utility. Therefore, the total utility is divided into two parts for a person:

$$U_{ij} = V_{ij} + \varepsilon_{ij},$$

where U_{ij} is the total utility of an option, alternative j for a person i;

V_{ij} is the observable and measurable part by the researcher, explained portion of utility (representative utility): Price, delivery time, reviews, payment security, etc.;

ε_{ij} is the unobservable, random part that is not directly measured by the researcher (random error), which reflects: Uncertainty, individual preferences, personal motives, mood, past experience, habit, trust, purchase urgency, etc.

Thus, according to this theory, the utility a consumer receives from an alternative consists of an observable component, determined by measurable attributes, and an unobservable random component, such as individual preferences, prior experience, or situational influences. Coming to choice mechanism, the buyer chooses alternative a over alternative b if $U_{ia} > U_{ib}$. Since utility includes a random component, choice can be modelled as a probability:

$$P(i \text{ chooses } a) = P(U_{ia} > U_{ib} \text{ for all } b \in \text{choice set}).$$

This theory, first developed from research on psychological incentives by Thurston (1927), was later expanded by McFadden (1974) to apply to economic modelling. When it comes to online platforms, consumers consider multiple attributes, including price, delivery speed, reviews, payment security, return policy, and more. Because of this, Random Utility Theory is especially

useful for studying the factors that influence consumer choices on these platforms, as it helps researchers understand how different attributes affect the probability of a consumer's selection. The theory is also closely linked to discrete choice models and choice-based conjoint analysis, which estimate the likelihood of a consumer choosing one option over others based on the utility derived from its attributes. This makes this theory a good fit for the current study, which looks at what drives consumer choice on online platforms in Kazakhstan. It supports trade-off analysis among platform attributes and enables researchers to see how consumers might assign different levels of importance to the same features.

In general, it can be said that according to Lancaster, consumers derive utility not only from a product's brand but also from its attributes. Meanwhile, according to McFadden, the consumer's chosen option is the one with the highest latent utility among available alternatives. This is precisely what the proposed attribute-based design of this consumer behaviour study reflects: Respondents choose not just one product in the abstract, but from a set of attributes, including price, payment, delivery time, and social proof in the form of ratings and reviews.

The Figure 1 below presents the proposed conceptual model which illustrates how consumers in Kazakhstan make online shopping decisions by evaluating multiple offer attributes simultaneously. This study views the purchase decision not as a simple "yes" or "no" choice but as a comparison among alternative offers. Each offer varies in price, payment method, delivery time, and social proof, which is represented by ratings and reviews. These attributes align directly with the survey's choice task structure, where respondents picked one preferred option from several alternatives during online shopping.

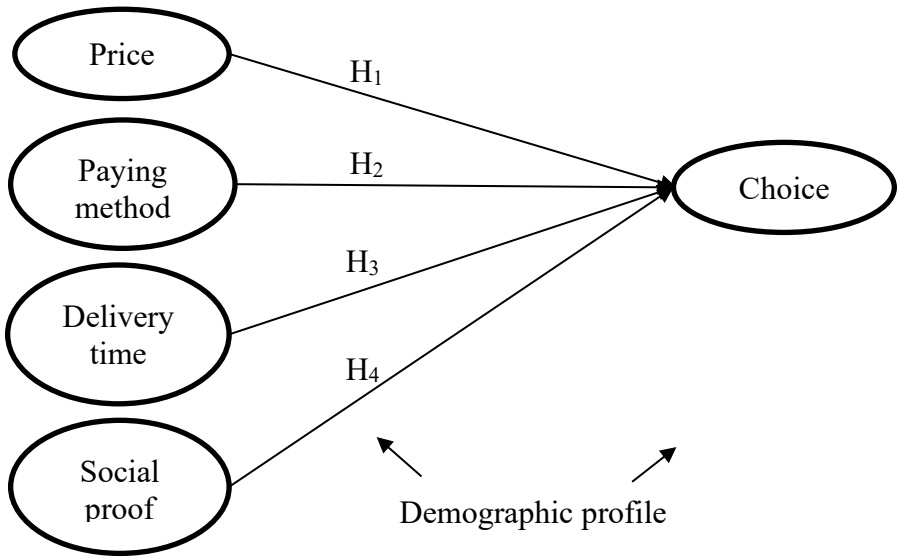


Figure 1. Proposed conceptual framework

The proposed conceptual framework of the present study is consistent with prior systematic review evidence of Ayalew and Zewdie (2022) showing that online consumer behaviour is shaped by several domains, including individual consumer characteristics, environmental influences, product and service characteristics, medium characteristics, and online merchant or intermediary characteristics. In this thesis, price, payment method, delivery time, and social proof represent observable offer-related attributes, while demographic profile is included to capture potential

differences in consumer preferences. Price, payment method, delivery time, and social proof can be viewed as observable vendor, service, product characteristics that influence consumers' decision-making. Demographic profile is included as a source of heterogeneity because consumers may differ in how they evaluate these attributes when making online purchase choices (Li and Zhang, 2002).

In this model, choice is the dependent variable. It reflects the consumer's final decision to select one online offering from competing alternatives or reject all options. The arrows from the four independent variables to the choice variable indicate that each attribute is expected to influence the likelihood of selecting an option. These attributes were chosen based on the qualitative interview phase and implemented in the choice-based survey as experimentally varied features of competing online offers. Consumers' attitudes toward online purchasing are shaped by several perceived advantages and disadvantages of the Internet as a shopping channel. Georgiades et al. (2000) declare that convenience, competitive prices, ease of ordering, and 24-hour access may encourage online purchasing, while concerns about security, privacy, unreliable technology, and lack of personal contact may discourage consumers from completing online transactions.

Online shopping behaviour can be analysed through technology acceptance and consumer behaviour frameworks. Asiedu and Dube (2020) integrated constructs from Technology Acceptance Model (TAM) and Unified Theory of Acceptance and Use of Technology (UTAUT), including perceived usefulness, perceived ease of use, attitude, social influence, convenience, online shopping experience, sentiment, and price promotion. This supports the view that online shopping behaviour is shaped by both technology-related factors and consumer-related psychological responses.

In general, the proposed model suggests that online shopping choices in Kazakhstan are shaped by a combination of economic value, payment convenience, delivery convenience, and trust-related factors. Empirical results indicate that social proof and price are the strongest determinants of decision making, while delivery speed also has a positive impact. Payment method matters, but its impact depends on the product category and the consumer's perception of financial flexibility. Demographic profiles add an additional layer of explanation, demonstrating that different consumer groups may value these attributes differently.

3. Methodology and Research Design

Phase 1: Semi-Structured Interviews

i)Method: 8–12 semi-structured interviews (20–25 minutes, online or offline).

ii) Purpose: Confirm which cues consumers actually use and identify realistic thresholds (e. g., what counts as "fast delivery," what rating/review levels matter, which payment options are meaningfully different).

iii) Output: A summary table linking interview themes forms the final attribute/level choices (auditability).

The qualitative phase consisted of semi-structured interviews with adult online shoppers in Kazakhstan. The purpose of this phase was not to test hypotheses, but to validate the attribute structure used in the later choice tasks. Interview notes were reviewed to identify recurring decision criteria, threshold expressions, and consumer language related to price, payment method, delivery time, ratings, and reviews.

Phase 2: Online Survey and CBC Tasks

i)Pilot: 40–50 respondents to check clarity, timing, and realism.

ii) Main survey: Online or offline survey (7–10 minutes) with repeated choice tasks (e. g., 10–12 tasks; three alternatives and "I do not want to answer").

iii) Quality controls: Randomised option order; attention check; removal of invalid responses (e. g., failed attention checks).

CBC is appropriate for studies where consumers evaluate several competing options rather than isolated variables. Parulian et al. (2024) explain that respondents are presented with choice sets containing different attribute levels, and their preferred options are used to infer which attributes have the strongest influence on decision-making. This supports the use of CBC in the present study, where respondents selected between online purchase offers differing in price, payment method, delivery time, ratings, and review volume.

Sampling and Recruitment

Frame: Adult online shoppers in Kazakhstan are reachable via online channels (social media, university, community networks, referrals).

Recruitment: Screened convenience sampling.

Inclusion criteria were a minimum age of participation in the survey is 18; residing in Kazakhstan; at least one online purchase within the last three months.

Target sample sizes

The target sample size for interviews was 8–12 participants, for the pilot survey 40–50 participants, and for the main survey, quantitative phase was 200–300 respondents, with a minimum acceptable threshold of approximately 210 responses. This range was considered appropriate for an exploratory master's thesis using repeated choice tasks and multivariate analysis. Orme (2010) explains that sample size decisions in conjoint studies depend on several factors, including the purpose of estimation, the number of conjoint questions, whether subgroup comparisons are required, market heterogeneity, sampling method, and available research resources. The present study used non-probability convenience sampling. Thus, the sample size was not intended to produce a nationally representative estimate. Instead, the purpose was to obtain sufficient data to estimate general preference patterns and conduct exploratory segmentation.

Measurement and Operationalization of Variables

Construct	Operationalisation	Measurement
Price	Price level in KZT	24,990 / 29,990 / 34,990 KZT
Payment method	Type of payment option	Card / BNPL / Cash on delivery
Delivery time	Expected delivery speed	Same-day / Next-day / 3–5 days
Social proof	Rating and review volume	3.9/80+, 4.4/300+, 4.8/1000+
Choice	Selected option	A / B / C / None

Figure 2. Construct and measurements used in the survey

The Figure 2 above describes the choice options that were used in the survey during the study.

4. Data Analysis and Results

Demographic Profile

The survey involved 215 participants who answered screening questions about living in Kazakhstan, having purchased an item online in the past three months, and being at least 18 years old. The questionnaire data provided a demographic profile based on gender, age, socioeconomic status, geographic location, and the language preference of the app used. According to the analysis shown in the Figure 3 below, the gender distribution reveals that the sample was predominantly female, making up 71.628% (n = 154) of respondents. Men represented 26.977% (n = 58), while a small group of 1.395% (n = 3) did not specify their gender. These figures show that women were significantly more represented in the study's sample.

Characteristic	Category	Number of respondents	Percentage
Gender	Female	154	71.628%
	Male	58	26.977%
	Prefer not to say	3	1.395%

Figure 3. Gender distribution of the survey respondents

The Figure 4 presents the age distribution of the survey participants, highlighting that the sample leans toward younger individuals: The largest group of respondents were aged 18–24 years, totalling 82 people (38.140%). Next were those aged 25–34, making up 29.302% (n = 63). The rest of the participants were fairly evenly spread across older age groups: 15.814% (n = 34) were aged 35–44, and 16.744% (n = 36) were 45 or older. These findings show the sample was relatively young, with over two-thirds of respondents (67.442%) falling within the 18–34 age range.

Characteristic	Category	Number of respondents	Percentage
Age	18–24 years	82	38.140%
	25–34 years	63	29.302%
	45 years and above	36	16.744%
	35–44 years	34	15.814%

Figure 4. Age distribution of the survey respondents

Among respondents, the most common income category was 300,000–500,000 tenge, representing 30.698% (n = 66) of the sample, as shown in the Figure 5. Next were those earning less than 299,999 tenge at 22.791% (n = 49), followed by individuals with incomes between 500,000 and 1,000,000 tenge at 20.930% (n = 45). A small portion, 3.721% (n = 8), reported high incomes above 1,000,000 tenge. Notably, 47 respondents (21.860%) chose not to disclose their income, highlighting that income is a sensitive demographic variable. Overall, we observe that the majority of the sample, 74.419% (n = 160), earns up to 1,000,000 tenge.

Characteristic	Category	Number of respondents	Percentage
Income	300,000–500,000 KZT	66	30.698%
	Less than 299,999 KZT	49	22.791%
	Prefer not to say	47	21.860%
	500,000–1,000,000 KZT	45	20.930%
	More than 1,000,000 KZT	8	3.721%

Figure 5. Income distribution of the survey respondents

Looking at the distribution of respondents by city of residence, Figure 6, the study was mainly focused in Almaty, where the vast majority live: 70.233% (151 respondents). A much smaller share comes from the capital, Astana (Nur-Sultan), making up 6.512% (n = 14), while the remaining 23.256% (n = 50) are from other cities. This group includes 22.326% from Kyzylorda, plus one respondent each from Aktau and Zhezkazgan, representing 0.465%. In other words, the survey was mostly completed by people from large cities, which should be taken into account when assessing the generalisability of the results to the broader population of Kazakhstan.

Characteristic	Category	Number of respondents	Percentage
City	Almaty	151	70.233%
	Kyzylorda	48	22.326%
	Astana (Nur-Sultan)	14	6.512%
	Aktau	1	0.465%
	Zhezkazgan	1	0.465%

Figure 6. Distribution of survey respondents by city of residence

According to the Figure 7, in the survey 112 respondents (52.093%) chose Russian as the language they use for online shopping apps. Kazakh was the primary language for 25.116% (n = 54), while 14.884% (n = 32) reported using a mixed language approach. At the same time, English was used by 7.907% (n = 17).

Characteristic	Category	Number of respondents	Percentage
Language	Russian	112	52.093%
	Kazakh	54	25.116%
	Mixed	32	14.884%
	English	17	7.907%

Figure 7. Distribution of respondents by preferred language of the application

Overall, the demographic profile of respondents shows that the sample mainly consisted of young women living in Almaty, with a large portion reporting a middle-income level and Russian as their primary language for using online shopping apps.

Online Shopping Behaviour

Frequency of online shopping	Number of respondents	Percentage
1–2 times a month	120	55.814%
Less than once a month	70	32.558%
1–2 times a week	14	6.512%
More than 3 times a week	11	5.116%

Figure 8. Distribution of respondents by online shopping frequency

Typical spending	Number of respondents	Percentage
10,000–29,000 KZT	98	45.581%
Under 10,000 KZT	52	24.186%
30,000–59,999 KZT	37	17.209%
More than 60,000 KZT	15	6.977%
Prefer not to say	13	6.047%

Figure 9. Distribution of respondents by typical spending per online purchase

Online platform	Number of respondents	Percentage
Kaspi.kz	197	91.628%
Instagram / Telegram shops	55	25.581%
Wildberries	44	20.465%

Figure 10. Distribution of respondents by using online platforms

Payment method	Number of respondents	Percentage
Card payment	168	78.140%
Bank transfer / QR / wallet	81	37.674%
0% instalments / BNPL	27	12.558%
Cash on delivery	24	11.163%

Figure 11. Distribution of respondents by using payment methods

Factor influencing choices the most	Number of respondents	Percentage
Price	90	41.860%
Reviews and ratings	77	35.814%
Delivery time	26	12.093%
Payment method	20	9.302%
Seller type (official or unofficial store)	2	0.930%

Figure 12. Distribution of respondents by the most influencing choice factor

According to the Figures 8–12 above the majority of respondents reported that they shop online 1–2 times a month (55.814%, n = 120), followed by those who shop online less than once a month (32.558%, n = 70). A smaller proportion reported that they shop online 1–2 times a week (6.512%, n = 14), while 5.116% (n = 11) shop online three or more times a week. Typical expenses for one online purchase were most often concentrated in the range of 10,000–29,999 tenge (45.581%, n = 98), followed by purchases of less than 10,000 tenge (24.186%, n = 52), 30,000–59,999 tenge (17.209%, n = 37) and more than 60,000 tenge (6.977%, n = 15). Another 6.047% of the respondents (n = 13) preferred not to disclose their typical spendings.

Regarding the use of platforms, the dominant online shopping platform has become Kaspi.kz, which was reported by 91.628% of respondents (n = 197), followed by Instagram / Telegram shops (25.581%, n = 55) and Wildberries (20.465%, n = 44). In terms of payment

behaviour, the most common method was card payment (78.140%, n = 168), followed by bank transfer / QR / wallet payments (37.674%, n = 81). Less frequently used methods included instalments at 0% / BNPL as 12.558% (n = 27) and cash payment upon delivery (11.163%, n = 24).

The respondents were also asked to indicate which factor had the greatest impact on their choice. The most frequently chosen factor was price, which was reported by 41.860% of respondents (n = 90). Reviews and ratings were the second most important factor chosen by 35.814% of respondents (n = 77). The delivery time was chosen by 12.093% of respondents (n = 26), and the payment method was chosen by 9.302% (n = 20). Only 0.930% of respondents mentioned the type of seller (n = 2). These results show that although price remains the most prominent decision-making factor, social validation in the form of reviews and ratings also plays an important role in online shopping decisions among consumers in Kazakhstan.

Qualitative Findings from Semi-Structured Interviews

A total of ten semi-structured interviews were conducted with adult online shoppers in Kazakhstan before the main survey. The interviews showed that participants had experience purchasing a wide range of products online, such as household goods, cosmetics, clothing, furniture, and electronics. Reported average purchase amounts varied considerably, ranging from approximately 5,000 to 200,000 tenge, which indicates that participants used online platforms for both everyday purchases and higher-value items.

The most frequently mentioned platforms were Kaspi.kz and Wildberries. Kaspi.kz was used by 8 out of 10 participants, making it the dominant platform in the interview sample, while Wildberries was mentioned by 3 out of 10 participants. This suggests that online shopping behaviour among participants was strongly shaped by marketplace familiarity, convenience, and platform accessibility.

The interviews also confirmed the importance of quality and price in online purchase decisions. Quality was mentioned by 8 out of 10 participants, while price was mentioned by seven participants as one of the main decision criteria. This indicates that consumers do not rely on price alone; instead, they compare affordability with perceived product reliability and expected quality.

Payment method was another important theme for the interviews. Card payment was the dominant routine payment method, used by nine participants. It was also the preferred payment option for 8 out of 10 respondents. This finding suggests that card payment is perceived as familiar, convenient, and sufficiently trustworthy for regular online purchases. In contrast, BNPL or instalment-based payment was not viewed as necessary for everyday purchases, but it became relevant for higher-cost products, especially electronics and imported goods.

Delivery speed also played a clear role in consumer decision-making. When comparing similar offers, nine participants preferred the fastest option, usually same-day or next-day delivery. This shows that fast delivery is an important convenience factor and can influence consumers' final choice when other attributes are comparable.

Finally, the interviews highlighted the role of ratings and reviews as trust-building signals. The minimum acceptable product rating ranged from 3.0 to 4.8, although most responses clustered around 4.0–4.5, with a median acceptable rating of 4.2. Review volume was also important: 8 out of 10 participants stated that they would need at least 100 reviews before feeling confident about an online purchase. These findings suggest that consumers use both rating scores and the number of reviews to reduce uncertainty and assess the credibility of online offers.

Overall, the interview results confirmed that the key attributes selected for the survey: Price, payment method, delivery time, and social proof were relevant for online shoppers in Kazakhstan.

The qualitative findings provided a practical basis for designing realistic choice scenarios in the quantitative second phase of the study.

Quantitative Findings from the Online Survey

Multiple Regression Analysis

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics: R Square Change	F Change	df_1	df_2	Sig. F Change
1	.999[a]	.999	.999	0.03612	.999	466,474.186	4	2145	< .001

a. Predictors: (Constant), Rating, Delivery, Payment, Price

Figure 13. Model summary

The multiple regression model demonstrated extremely high overall fit. The model yielded an R^2 value of .999, indicating a nearly perfect relationship between the set of independent variables and the dependent variable. The R^2 value was .999, meaning that approximately 99.9% of the variance in the ratings was explained by four predictors: price, payment, delivery, and rating. The adjusted R^2 was also .999, indicating that the model retained its explanatory power after adjusting for the number of predictors.

The standard error of the estimate was 0.03612, indicating that the predicted ratings were very close to the observed values. The change statistic also confirmed that the model significantly improved prediction, with F Change = 466,474.186, $df_1 = 4$, $df_2 = 2145$, and $p < .001$.

This result demonstrates that the four attributes included in the model collectively explain consumer evaluations with very high statistical accuracy. Such a high R^2 may indicate that the dependent variable is closely related to the same attributes included as predictors or has a strong structure based on them. Therefore, the model is very useful for determining the relative contribution of each attribute, but an extremely high R^2 should not be interpreted as a typical predictive effect in real-world settings without methodological caution.

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2434.571	4	608.643	466,474.186	< .001[b]
	Residual	2.799	2145	0.001		
	Total	2437.369	2149			

a. Dependent Variable: Evaluation

b. Predictors: (Constant), Rating, Delivery, Payment, Price

Figure 14. ANOVA[a] results

The Analysis of Variance (ANOVA) results confirmed the statistical significance of the overall regression model. The regression sum of squares was 2434.571, while the residual sum of squares was only 2.799, indicating that very little unexplained variance remained after including the predictors. The total sum of squares was 2437.369.

The regression model had 4 degrees of freedom, corresponding to the four predictors, while the residuals had 2145 degrees of freedom. The mean square for the regression was 608.643,

compared to a mean square for the residuals of approximately 0.001. The resulting F-statistic was extremely large: F (4, 2145) = 466,474.186, p < .001.

This means that the combined effect of price, payment, delivery, and rating on consumer ratings was statistically significant. In other words, the model as a whole provides a meaningful explanation of how respondents evaluated online shopping options.

Model		Unstandardised Coefficients		Standardised Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	2.199	0.005		441.328	< .001					
	Price	−1.2	0.005	−0.518	−237.446	< .001	−.776	−.982	−.174	0.112	8.902
	Payment	−0.2	0.005	−0.085	−39.49	< .001	−.157	−.649	−.029	0.115	8.729
	Delivery	0.8	0.005	0.322	157.849	< .001	.389	.96	.115	0.129	7.776
	Rating	1.8	0.005	0.632	352.334	< .001	.725	.991	.258	0.166	6.008

a. Dependent Variable: Evaluation

Figure 15. Coefficients[a] results

The regression coefficients show the direction and strength of each attribute's influence on consumer ratings.

According to the Figure 4, constant B = 2.199, t = 441.328, p < .001. This represents the baseline evaluation when holding all predictor variables constant.

Price had a negative and statistically significant effect on ratings: B = −1.200, SE = 0.005, β = −0.518, t = −237.446, p < .001. This means that as price increased, consumer ratings decreased. The standardized beta coefficient indicates that price was the second-strongest predictor in the model after rating. This result supports the hypothesis that lower prices increase the likelihood of an online offer being preferred.

Payment method also had a negative and statistically significant effect: B = −0.200, SE = 0.005, β = −0.085, t = −39.490, p < .001. Although the effect was statistically significant, its standardised beta coefficient was relatively small compared to other predictors. This demonstrates that payment method influenced consumer evaluations, but its effect was weaker than the effects of price, delivery, and rating. The negative coefficient indicates that, with the coding used in the dataset, higher-value coded payment options were associated with lower evaluations. This is consistent with previous findings that flexible payment options such as BNPL may not automatically increase preference in a moderately priced purchase scenario.

Delivery had a positive and statistically significant effect on ratings: B = 0.800, SE = 0.005, β = 0.322, t = 157.849, p < .001. This indicates that better or faster delivery conditions increased consumer ratings. The standardised beta coefficient indicates that delivery was the third strongest predictor. Thus, delivery time is an important practical attribute in online purchasing decisions, although its impact was weaker than that of ratings and price.

Ratings and reviews had the strongest positive effect on ratings: B = 1.800, SE = 0.005, β = 0.632, t = 352.334, p < .001. This indicates that higher ratings and stronger review signals

significantly increase consumer ratings. Among all predictors, rating had the highest standardised beta coefficient, indicating that social proof was the strongest driver of consumer evaluation in this model. This finding supports the idea that consumers in Kazakhstan rely heavily on ratings and reviews when evaluating online offers.

Correlations and Partial Effects Analysis

Zero-order correlations further support this interpretation. Rating showed a strong zero-order positive correlation with score ($r = .725$), while price showed a strong zero-order negative correlation ($r = -.776$). Delivery showed a moderate zero-order positive correlation ($r = .389$), while payment showed a weaker negative correlation ($r = -.157$).

Partial correlations were also very strong for rating (partial $r = .991$), price (partial $r = -.982$), and delivery (partial $r = .960$), indicating that these variables retained a strong relationship with score even after accounting for other predictors. Payment showed a weaker, but still significant, partial correlation (partial $r = -.649$).

These results confirm that ratings and reviews, price, and delivery independently contributed to consumer evaluations, while payment played a smaller but statistically significant role.

Relative Importance of Predictors

Standardised beta coefficients allow us to compare the relative importance of predictors. Rating was found to be the strongest predictor with $\beta = 0.632$, followed by price with $\beta = -0.518$, then delivery time with $\beta = 0.322$, and finally payment with $\beta = -0.085$.

This rating suggests that consumer evaluation was primarily determined by social proof, followed by economic value and delivery convenience. Payment method was statistically significant, but played a relatively minor role.

The results indicate that consumers were not solely driven by price. While price had a strong negative impact, ratings and reviews had an even stronger positive impact. This suggests that a lower price may increase appeal, but an offer with a high rating and strong reviews can build even greater trust and consumer preference.

Collinearity Diagnostics

Collinearity statistics indicate that multicollinearity should be considered when interpreting the model. The acceptable error values were 0.112 for price, 0.115 for payment, 0.129 for delivery time, and 0.166 for rating and reviews. The corresponding Variance Inflation Factor (VIF) values were 8.902, 8.729, 7.776, and 6.008.

These VIF values are below the generally accepted critical threshold of 10, but still relatively high. This suggests that the predictors were significantly correlated with each other, which is typical for structured data from conjoint analysis or choice problems, where attributes are systematically combined across scenarios. Therefore, although the model is statistically strong, individual coefficients should be interpreted as part of the combined attribute structure, rather than as completely independent causal effects in the real world.

Cluster Analysis and Consumer Heterogeneity

To test H_5, which proposed that consumer preferences would not be uniform and that consumer segments would differ in the weight they place on price, delivery, payment, and social proof, cluster analysis was conducted. The purpose of this analysis was to identify whether respondents could be grouped into distinct consumer segments based on differences in their preference patterns. Similar to Sulianta et al. (2024), who used K-Means clustering to identify

consumer preference patterns based on price and rating, the present study applies clustering logic to distinguish consumer groups according to their online purchase choice behaviour.

Cluster analysis was used to examine whether respondents demonstrated different preference patterns when evaluating online purchase offers. This approach is consistent with previous customer segmentation research of Utomo et al. (2025), where K-Means clustering was applied to identify groups of consumers with different demographic and behavioural characteristics. In the present study, segments were interpreted according to respondents' tendency to prioritise price, delivery speed, payment method, social proof, or rejection of all options.

To further examine whether these clusters differed in terms of observable demographic and behavioural characteristics, a one-way Multivariate Analysis of Variance (MANOVA) was conducted. Cluster membership was used as the independent grouping variable, while age, gender, city of residence, income, and spending were included as dependent variables. The aim of this analysis was not only to describe the clusters, but also to determine whether the identified consumer segments were associated with respondent characteristics.

Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.936	157.669[b]	5.000	54.000	< .001
	Wilks' Lambda	.064	157.669[b]	5.000	54.000	< .001
	Hotelling's Trace	14.599	157.669[b]	5.000	54.000	< .001
	Roy's Largest Root	14.599	157.669[b]	5.000	54.000	< .001
Cluster	Pillai's Trace	.350	1.478	15.000	168.000	.118
	Wilks' Lambda	.679	1.503	15.000	149.472	.111
	Hotelling's Trace	.433	1.519	15.000	158.000	.104
	Roy's Largest Root	.312	3.492[c]	5.000	56.000	.008

a. Design: Intercept + Cluster
b. Exact statistic
c. The statistic is an upper bound on F that yields a lower bound on the significance level

Figure 16. Multivariate tests[a]

The multivariate test results provide mixed evidence regarding overall differences between clusters. Pillai's Trace, Wilks' Lambda, and Hotelling's Trace were not statistically significant. For example, Wilks' Lambda was 0.679, F = 1.503, p = 0.111, indicating that the overall multivariate difference between clusters across all demographic and behavioural variables was not statistically significant at the 0.05 level. However, Roy's Largest Root was significant, F = 3.492, p = 0.008. Since Roy's Largest Root is more sensitive to the strongest single dimension of difference between groups, this result suggests that at least one important dimension may distinguish the clusters.

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Cluster	Age	3.271[a]	3	1.090	.979	.409
	Gender	1.125[b]	3	.375	1.274	.292
	City	3.917[c]	3	1.306	1.457	.236
	Income	24.823[d]	3	8.274	4.271	.009
	Spending	.299[e]	3	.100	.067	.977

a. R Squared = .048 (Adjusted R Squared = −.001)
b. R Squared = .062 (Adjusted R Squared = .013)
c. R Squared = .070 (Adjusted R Squared = .022)
d. R Squared = .181 (Adjusted R Squared = .139)
e. R Squared = .003 (Adjusted R Squared = −.048)

Figure 17. Tests of between-subjects effects

The tests of between-subjects effects show that income was the only variable that significantly differed across clusters, F = 4.271, p = 0.009. In contrast, age, gender, city of residence, and spending were not statistically significant. Age was not significant, F = 0.979, p = 0.409; gender was not significant, F = 1.274, p = 0.292; city was not significant, F = 1.457, p = 0.236; and spending was not significant, F = 0.067, p = 0.977.

Bonferroni

Dependent Variable	(I) Cluster Number of Case	(J) Cluster Number of Case	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Age	1	2	−.357	.368	1.000	−1.36	.65
		4	.506	.537	1.000	−.96	1.97
		5	.039	.335	1.000	−.87	.95
	2	1	.357	.368	1.000	−.65	1.36
		4	.863	.541	.697	−.61	2.34
		5	.396	.341	1.000	−.53	1.33
	4	1	−.506	.537	1.000	−1.97	.96
		2	−.863	.541	.697	−2.34	.61
		5	−.467	.519	1.000	−1.88	.95
	5	1	−.039	.335	1.000	−.95	.87
		2	−.396	.341	1.000	−1.33	.53
		4	.467	.519	1.000	−.95	1.88
Gender	1	2	.221	.189	1.000	−.30	.74
		4	.471	.276	.561	−.28	1.22
		5	.054	.172	1.000	−.42	.52
	2	1	−.221	.189	1.000	−.74	.30
		4	.250	.278	1.000	−.51	1.01
		5	−.167	.175	1.000	−.64	.31
	4	1	−.471	.276	.561	−1.22	.28
		2	−.250	.278	1.000	−1.01	.51
		5	−.417	.267	.742	−1.15	.31
	5	1	−.054	.172	1.000	−.52	.42

		2	.167	.175	1.000	−.31	.64
		4	.417	.267	.742	−.31	1.15
City	1	2	−.574	.330	.524	−1.47	.33
		4	.176	.482	1.000	−1.14	1.49
		5	−.074	.300	1.000	−.89	.75
	2	1	.574	.330	.524	−.33	1.47
		4	.750	.485	.765	−.57	2.07
		5	.500	.306	.643	−.33	1.33
	4	1	−.176	.482	1.000	−1.49	1.14
		2	−.750	.485	.765	−2.07	.57
		5	−.250	.465	1.000	−1.52	1.02
	5	1	.074	.300	1.000	−.75	.89
		2	−.500	.306	.643	−1.33	.33
		4	.250	.465	1.000	−1.02	1.52
Income	1	2	.706	.485	.905	−.62	2.03
		4	1.106	.708	.743	−.83	3.04
		5	−.669	.441	.809	−1.87	.54
	2	1	−.706	.485	.905	−2.03	.62
		4	.400	.713	1.000	−1.55	2.35
		5	−1.375*	.449	.020	−2.60	−.15
	4	1	−1.106	.708	.743	−3.04	.83
		2	−.400	.713	1.000	−2.35	1.55
		5	−1.775	.684	.072	−3.64	.09
	5	1	.669	.441	.809	−.54	1.87
		2	1.375*	.449	.020	.15	2.60
		4	1.775	.684	.072	−.09	3.64
Spending	1	2	.096	.425	1.000	−1.07	1.26
		4	.271	.621	1.000	−1.43	1.97
		5	.096	.387	1.000	−.96	1.15
	2	1	−.096	.425	1.000	−1.26	1.07
		4	.175	.625	1.000	−1.53	1.88
		5	.000	.394	1.000	−1.08	1.08
	4	1	−.271	.621	1.000	−1.97	1.43
		2	−.175	.625	1.000	−1.88	1.53
		5	−.175	.600	1.000	−1.81	1.46
	5	1	−.096	.387	1.000	−1.15	.96
		2	.000	.394	1.000	−1.08	1.08
		4	.175	.600	1.000	−1.46	1.81

Based on observed means.
The error term is Mean Square (Error) = 1.490.
* The mean difference is significant at the .05 level.

Figure 18. Multiple comparisons table

The Bonferroni post-hoc comparisons further indicate that the significant income difference was mainly observed between Cluster 2 and Cluster 5. The mean difference between these two clusters was statistically significant, MD = −1.37, SE = 0.449, p = 0.020, 95% CI [−2.60, −0.15]. This means that respondents in Cluster 2 had significantly lower income levels than respondents in Cluster 5, assuming that higher income categories were coded with higher numerical values. The comparison between Cluster 4 and Cluster 5 approached significance, MD = −1.77, p = 0.072, but did not reach the conventional 0.05 level after Bonferroni correction.

The cluster analysis indicates that consumers can be grouped into different segments, supporting the assumption that preferences are heterogeneous rather than uniform. On the other hand, the MANOVA results show that these clusters are not strongly differentiated by most demographic variables. Only income significantly differed across clusters.

The significant income difference is theoretically meaningful. Income may influence purchasing power, perceived affordability, and sensitivity to price or payment conditions. Lower-income consumers may be more likely to prioritise price or flexible payment options, while higher-income consumers may be more willing to pay for stronger trust signals, faster delivery, or greater convenience. In this way, income may partly explain why some respondents belong to different preference-based segments.

Hypotheses Evaluation

Hypothesis	Result	Interpretation
H_1 Price	Supported	Lower price increased the likelihood of choice.
H_2 Payment	Not supported	Flexible payment options, including BNPL or instalments, did not significantly increase choice probability relative to standard card payment.
H_3 Delivery	Supported	Shorter delivery time increased choice probability.
H_4 Social proof	Supported	Stronger social proof, represented by higher ratings and more reviews, increased choice probability.
H_5 Heterogeneity	Partially supported	The results suggest the existence of preference-based consumer segments, although most demographic variables did not significantly differentiate the clusters. Income was the only significant demographic differentiator.

Figure 19. Hypotheses evaluation table

The results support several proposed hypotheses. Firstly, H_1 states that a lower price will increase the likelihood of selecting an option. This hypothesis is supported. Price had a strong negative and statistically significant effect on evaluations, meaning higher prices reduced attractiveness.

Secondly, H_2 states that more convenient or financially flexible payment options will increase the likelihood of selection. This hypothesis is not supported in the expected direction. Payment method was statistically significant, but the coefficient was negative. This suggests that payment options coded at higher levels were associated with lower evaluations. In practice, consumers may prefer simple and familiar payment methods to more flexible or complex alternatives in the context of a given product.

Thirdly, H_3 states that faster delivery will increase the likelihood of selection. This hypothesis is supported. Delivery had a positive and statistically significant effect on evaluations, indicating that better delivery conditions increase consumer preference.

Fourth, H_4 states that higher ratings and more reviews will increase the likelihood of selection. This hypothesis is convincingly supported. Rating showed the largest positive

standardised beta coefficient in the model, indicating that social proof is the most powerful predictor of consumer evaluation.

Lastly, H_5 proposed that consumer preferences would be heterogeneous, meaning that different consumer segments would assign different levels of importance to price, delivery, payment method, and social proof. This hypothesis is partially supported. The regression results alone do not directly test segmentation, as they estimate the average effect of each attribute across the full sample. However, the substantial differences in the standardised effects indicate that the attributes did not contribute equally to consumer choice. This provides initial evidence that consumers may evaluate online offers through different decision-making priorities. Therefore, H_5 is further assessed through cluster analysis, which allows the study to identify whether distinct preference-based consumer segments exist.

General Interpretation

The analysis shows that consumer decision-making on online platforms in Kazakhstan is significantly determined by visible and comparable characteristics of offers. Social proof such as ratings and reviews emerged as the most important factor in the model, suggesting that consumers rely heavily on social proof when evaluating online offers. This is particularly important in online shopping, where consumers cannot physically inspect a product before purchasing and therefore use ratings and reviews as signals of product reliability, seller trust, and risk mitigation.

The cluster analysis identified five interpretable consumer segments. These segments were differentiated primarily by their dominant preference patterns rather than by demographic characteristics alone. Specifically, consumers differed in the relative importance they assigned to price, delivery speed, payment method, and social proof. Demographic and behavioural variables were then used to profile each segment and provide a clearer interpretation of their decision-making patterns.

Segment	Core preference profile	Main demographic profile	Main behavioural profile	Interpretation
Trust and speed seekers	This segment is mainly driven by social proof and delivery speed. Consumers in this group place strong importance on ratings, reviews, and fast fulfilment.	Mostly female respondents (78.378%); mainly aged 25–34 (40.541%) and 18–24 (33.784%); mostly Almaty-based (75.676%).	Most commonly shopped online 1–2 times per month (60.811%); 48.649% spent 10,000–29,999 KZT; Kaspi was used by 90.541%; card payment was used by 77.027%; reviews and ratings were the most selected decision factor (52.703%).	This group appears to be trust-oriented and convenience driven. They are likely to choose offers that reduce uncertainty and provide fast delivery.
Mixed evaluators	This segment evaluates online	Mostly female respondents	50.794% shopped online 1–2 times	This group represents selective

(selective evaluators)	offers through a balanced combination of attributes, particularly price and social proof. No single attribute fully dominates their decision-making.	(68.254%); mainly aged 18–24 (39.683%) and 25–34 (28.571%); mostly Almaty-based (73.016%).	per month; 44.444% spent 10,000–29,999 KZT; Kaspi was used by 93.651%; card payment was used by 77.778%; price (41.270%) and reviews and ratings (39.683%) were almost equally important.	comparison-oriented consumers. They appear to compare several attributes before choosing rather than relying on one dominant cue.
Price sensitive (value seekers)	This segment is primarily driven by price and perceived value for money. Consumers in this group show the strongest tendency to select the cheapest available option.	Female respondents were still the majority (60.606%), but this segment had a relatively higher male share (39.394%); mostly aged 18–24 (39.394%) and 35–44 (27.273%); mostly Almaty-based (66.667%).	This segment had the highest tendency to choose the cheapest option (72.121%); 54.545% spent 10,000–29,999 KZT; Kaspi was used by 93.939%; card payment was used by 93.939%; price was the clearly dominant stated decision factor (69.697%).	This group can be interpreted as highly price-conscious consumers. They are likely to respond to discounts, lower prices, and visible value advantages.
Payment flexible (BNPL-oriented shoppers)	This segment is mainly characterised by interest in payment flexibility, including BNPL or instalment-based payment options.	Mostly female respondents (62.500%); the youngest share was high, with 45.833% aged 18–24, but this segment also had the highest 45 years older share (29.167%); mostly	This segment had the highest tendency to choose BNPL options (59.167%); 41.667% spent 30,000 KZT or more; Kaspi was used by 100.000%; BNPL had previously been used by 33.333%; price (33.333%) and payment method (29.167%) were the most	This group appears to be payment flexibility-oriented. They may not necessarily seek the lowest price, but they value the ability to manage payment over time.

		Almaty-based (70.833%).	common stated decision factors.	
Low engagement (non-choice shoppers)	This segment is defined by a strong tendency to reject the available options and select "none of these options."	Mostly female respondents (85.714%); more geographically mixed, with 47.619% from Almaty and 42.857% from Kyzylorda; relatively higher share of respondents aged 35–44 (33.333%).	This segment most frequently selected "none of these options" (90.476%); 42.857% shopped 1–2 times per month and 42.857% shopped less than once per month; Kaspi use was lower than in other segments (76.190%); price remained the most selected stated factor (57.143%).	This group can be interpreted as low engagement or highly selective consumers. They may require stronger incentives, greater trust signals, or better offer fit before making a purchase.

Note. Percentages describing demographic and behavioural characteristics were calculated based on the number of respondents in each cluster. In contrast, percentages describing choice tendencies, such as choosing the cheapest option, selecting BNPL, or choosing "none of these options," were calculated based on the total number of CBC choice tasks completed within each cluster. Therefore, these indicators reflect the proportion of choices rather than the proportion of individual respondents.

Figure 20. Consumer segments based on cluster analysis

Based on these patterns, five interpretable segments were identified: trust and speed seekers, mixed evaluators (selective evaluators), price sensitive (value seekers), payment flexible (BNPL-oriented shoppers), and low engagement (non-choice shoppers).

The identified segments are consistent with prior research demonstrating that online consumers are heterogeneous in their preferences. For example, Nguyen et al. (2019) identified distinct groups such as price-oriented, time- and convenience-oriented, and value-for-money-oriented consumers. Similarly, the present study found that consumers in Kazakhstan differ in the relative emphasis they place on price, social proof, delivery speed, and payment flexibility.

5. Discussion, Conclusion and Implications

Summary of Key Findings

This study examined the factors influencing consumer choice on online platforms in Kazakhstan, with a focus on the impact of price, payment method, delivery time, and social confirmation. The results are based on a consistent mixed research method that includes semi-structured interviews and an online survey. The qualitative stage helped to confirm the significance of the selected attributes, and the quantitative stage tested their impact on the assessment and choice of consumers.

Qualitative results have shown that online shoppers in Kazakhstan consider several attributes when choosing between competing online offers. The participants mentioned quality, price,

convenience of payment, speed of delivery, ratings and reviews as important criteria for making a decision. Kaspi.kz It was the most frequently mentioned platform in interviews, while card payment was the dominant and preferred payment method. Payment by instalments or payment via BNPL was not considered necessary for everyday purchases, but was considered more relevant for high-value items such as electronics and imported goods. The interviews also showed that speed of delivery and social validation are important: most participants preferred faster delivery, and many needed a high enough rating and a large number of reviews before they felt confident in buying.

The survey results further confirmed the importance of these characteristics. The demographic profile showed that the sample consisted mainly of young respondents, women and residents of Almaty. The majority of respondents reported making online purchases once or twice a month, and typical expenses were most often concentrated in the range of 10,000-29,999 tenge. Kaspi.kz It was the dominant platform for online shopping, and card payment was the most common payment method. These results show that the sample reflects the active users of online shopping platforms, especially in the urban consumer environment.

Descriptive results showed that when respondents were asked which factor most influenced their choice, price was most often chosen, followed by reviews and ratings. This suggests that price remains a very prominent decision-making factor, but social validation also plays an important role in consumer decision-making. Delivery time and payment method were less often chosen as the most important factors, although they still contributed to the consumer's assessment in the regression model.

Regression analysis showed that all four main attributes: Price, payment method, delivery time, and rating/reviews are statistically significant predictors of consumer ratings. Ratings and reviews had the strongest positive impact, indicating that social proof was the most influential predictor in the model. The price had a strong negative impact, showing that higher prices reduce the attractiveness of the online offer. The delivery time had a positive impact, confirming that faster delivery increases consumer appreciation. The payment method was statistically significant, but had the weakest impact and did not confirm the expected positive role of flexible payment options.

Hypothesis testing showed that H_1, H_3, and H_4 were confirmed. The lower price increased consumer appreciation, confirming H_1. Faster delivery increased consumer appreciation, confirming H_3. Higher ratings and a larger volume of reviews have increased consumer appreciation, which strongly confirms H_4. H_2 has not been validated in the expected direction, as flexible payment options such as BNPL have not increased appreciation compared to more conventional payment methods. H_5 was partially supported. The cluster analysis indicated the presence of distinct preference-based consumer segments, suggesting that respondents differed in the importance they assigned to price, delivery time, payment method, and social proof. The MANOVA results showed that demographic differences between the clusters were limited, with income being the only statistically significant differentiating variable. Therefore, the findings support preference heterogeneity.

In this way, the results of the study show that the choice of online shoppers in Kazakhstan is shaped by a combination of economic value, convenience, and trust related signals. However, social validation has proven to be the strongest factor, indicating that consumers rely heavily on ratings and reviews to reduce uncertainty when shopping online. Price remains an important factor, but consumers are not only guided by price. Instead, they seem to evaluate online offers by considering a broader range of factors such as accessibility, trust, convenience of delivery, and familiarity with payment methods.

Research question	Answer based on the findings
RQ_1: Which attributes most strongly influence consumers' online purchase choices in Kazakhstan?	The findings show that consumer choice was mainly influenced by social proof and price. Higher ratings and a larger number of reviews increased the likelihood of choice, while lower price also made an offer more attractive. Delivery time had a positive effect, whereas payment method, particularly BNPL, did not significantly increase choice probability compared with standard card payment.
RQ_2: What is the relative importance of each attribute when consumers choose between competing offers?	The results indicate that social proof and price were the most influential attributes, followed by delivery time. Payment method had a weaker and more context-dependent effect. This suggests that consumers in Kazakhstan pay particular attention to trust signals and economic value when comparing online offers.
RQ_3: How do consumers trade off these attributes?	The findings suggest that consumers are willing to make trade-offs between price, delivery speed, and social proof. For example, stronger ratings and reviews can increase the attractiveness of an offer, while higher price may reduce it unless compensated by other benefits such as trust or faster delivery. BNPL did not appear to provide a strong advantage in the tested scenario, suggesting that payment flexibility may depend on product type and purchase value.
RQ_4: Are there distinct segments of consumers with systematically different preference patterns?	The cluster analysis identified distinct preference-based consumer segments, including trust and speed seekers, mixed evaluators (selective evaluators), price-sensitive consumers, payment-flexible shoppers, and low engagement (non-choice shoppers). This supports the presence of consumer heterogeneity. At the same time, MANOVA results showed that demographic differences between clusters were limited, with income being the only significant differentiating variable.

In general, the research questions were addressed through the combined interpretation of the regression, choice-based analysis, cluster analysis, and MANOVA results. The findings show that online consumer choice in Kazakhstan is shaped mainly by social proof, price, and delivery time, while payment method plays a more limited role in the tested purchase scenario. The results also demonstrate that consumers are not homogeneous: They differ in their decision-making priorities and can be grouped into distinct preference-based segments. It means that this study provides both attribute-level and segment-level evidence on how consumers evaluate online offers in Kazakhstan.

5.1 Practical Implications for Platforms and Sellers

The results of this study have a number of practical implications for online platforms, trading platforms and sellers in Kazakhstan. The results show that consumers evaluate online offers using a combination of price, social confirmation, convenience of delivery, and payment method. However, these factors do not have the same impact. Ratings and reviews had the strongest positive

impact on consumer ratings, followed by price and delivery time, while the payment method had the least impact. That is why platforms and sellers should focus not only on discounts, but also on building trust and convenience.

First, online platforms and sellers should reinforce visible signals of trust. Since ratings and reviews have proven to be the strongest determinant of consumer appreciation, convincing social validation is essential to increase consumer confidence. Platforms should encourage trusted customers to leave reviews, clearly display the number of reviews, and, if possible, highlight photo reviews or verified reviews. Sellers should monitor reviews, respond professionally to complaints, and use reviews to improve product descriptions, service quality, and delivery times.

Second, sellers should maintain competitive prices, but not rely solely on a low price. The results show that higher prices reduce consumer appreciation, confirming the importance of price sensitivity. However, ratings and reviews had an even stronger impact than the price. This means that a low price can attract attention, but weak social confirmation can reduce trust. Therefore, sellers should combine competitive prices with reliable product information, positive reviews, a clear return policy, and a visible seller's reputation.

Third, delivery should be considered as part of the value proposition. Faster delivery has increased consumer appreciation, showing that speed of delivery is an important convenience factor. Platforms and merchants should improve the reliability of delivery, provide accurate estimates of delivery times, and offer tracking where possible. Delivery promises should be realistic, as delayed or unreliable delivery can reduce trust and negatively affect future purchases.

Sellers should not assume that all consumers respond primarily to lower prices. Some consumers are more influenced by trust signals, some by delivery speed, some by payment flexibility, and others by a balanced combination of attributes. In other words, effective online selling in Kazakhstan requires differentiated strategies that reflect consumer heterogeneity.

Lastly, platforms and sellers should take into account that consumer preferences may vary. Some consumers may be more price-sensitive, while others may be more focused on trust or convenience. Therefore, online offers should combine several strengths, rather than depend on a single attribute. The most attractive offers are likely to be those that combine competitive prices, high ratings and reviews, reliable delivery, and familiar payment methods.

5.2 Future Research Directions

In future studies, the sample could be expanded to include more respondents from different regions of Kazakhstan, including small towns and rural areas. This would help to improve the generalisability of the results beyond the large urban markets.

Second, future research could explore different product categories. Since this study focused on the mid-price goods scenario, future studies could compare low-, medium-, and high-price purchases to better understand when BNPL and other flexible payment options become more attractive.

Third, future research could combine survey data with data on actual behaviour on the platform or transactions. This would allow researchers to compare stated preferences with actual purchasing decisions and provide more convincing evidence of how consumers choose online offers.

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Strategic Compartmentalization: How Kazakhstan Uses BRI Economic Integration to Reinforce Foreign Policy Autonomy (2013-2023)

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ABSTRACT

This article analyzes Kazakhstan's pursuit of its multi-vector foreign policy by deepening economic engagement with China through the Belt and Road Initiative from 2013 to 2023. The key argument is that Kazakhstan preserves its strategic autonomy not by opposing integration with China, but by purposefully separating economic cooperation from political and security alignment, a process referred to here as strategic compartmentalization. By maintaining this separation, Kazakhstan leverages economic ties for growth while safeguarding its independent foreign policy choices. The analysis relies on qualitative evaluation of publicly available official documents, presidential addresses, foreign policy concepts, and secondary economic and transport indicators from official datasets.

The data indicate that Kazakhstan consistently frames its cooperation with China in economic and developmental terms. Even as Kazakhstan seeks new partnerships and diversification, it avoids fully aligning with a single power. These results offer a nuanced perspective on expectations regarding asymmetric interdependence, suggesting that deeper economic engagement can, under specific conditions, strengthen rather than diminish autonomy. This article advances the concept of strategic compartmentalization as an analytical framework, enhancing our understanding of Kazakhstan's multi-vectorism. It demonstrates how a strategically positioned middle power may leverage integration to build resilience within a competitive regional order.

Keywords: multi-vectorism, BRI, middle powers, strategic autonomy, economic diplomacy, multiplex peace, Middle Corridor, compartmentalization.

1. INTRODUCTION

The contemporary international system is increasingly characterized by pervasive interdependence, overlapping interests, and a diminished role for any single great power in shaping the global order. Recent scholarship describes this as a multiplex environment in which states navigate broad partnerships and selectively engage across issue areas. For countries in strategically contested regions, however, deeper economic integration with major powers often brings new forms of dependence that can restrict foreign policy autonomy (Neafie et al., 2025; Thorhallsson, 2018). This study addresses how states manage the tension between engagement and autonomy in such circumstances.

Kazakhstan exemplifies this strategic challenge. As the world's largest landlocked state and a central Eurasian nation, Kazakhstan has long pursued a multi-vector foreign policy to maintain sovereignty, balance major powers, and maximize diplomatic flexibility. This approach has prioritized external connectivity, transit diversification, and access to foreign markets (Kassen, 2018; Nyshanbayev et al., 2024). Since 2013, Kazakhstan's engagement with China's Silk Road Economic Belt and later the Belt and Road Initiative (BRI) has intensified economic modernization

and regional relevance, while raising questions about the impact of deepening ties with China on Kazakhstan's foreign policy autonomy.

Conventional wisdom suggests that greater economic dependence on a stronger power constrains policy autonomy for smaller states. Policy debates on the BRI often focus on dependency and the erosion of autonomy. Yet Kazakhstan's experience challenges this narrative. This article argues that Kazakhstan maintains its multi-vector foreign policy not by resisting economic integration with China, but by compartmentalizing economic cooperation from political and security alignment. Building on, but expanding, Contessi's issue-splitting concept, the paper posits that Kazakhstan organizes distinct spheres in its relationship with China, ensuring that economic ties do not dictate its broader external orientation (Contessi, 2015).

This research investigates how Kazakhstan balances growing economic ties with China under the BRI while sustaining multi-vector foreign policy autonomy from 2013 to 2023. The central claim is that Kazakhstan employs three forms of strategic compartmentalization: discursively framing BRI cooperation as economic and developmental; structurally diversifying routes and partnerships; and strategically embedding China relations within broader networks. Qualitative analysis of official documents and economic data demonstrates how this compartmentalization operates in practice.

The article offers three key contributions. First, it treats strategic compartmentalization as a clear explanation for small and mid-sized states facing unbalanced economic ties. Second, it gives a subtle reading of Kazakhstan's foreign policy, rejecting simple balancing, bandwagoning, or passive accommodation. Third, it enriches the debate on asymmetric interdependence by arguing that closer economic ties do not always entail a loss of autonomy. Sometimes, these ties can actually strengthen independence.

2. LITERATURE REVIEW AND THEORETICAL FRAMEWORK

Kazakhstan's foreign policy is typically understood through the framework of multi-vectorism. Kassen (2018) describes this as a pragmatic strategy shaped by Kazakhstan's landlocked and transcontinental setting, one that seeks to turn geographic constraints into diplomatic flexibility and external access. Omelicheva and Du (2018) add that Kazakhstan's multi-vectorism is active, enabling tactical concessions and leverage against stronger rivals. Vanderhill, Joireman, and Tulepbayeva (2020) similarly present Kazakhstan's behavior as that of a secondary power, stressing omni-enmeshment and complex balancing, beyond mere balancing or bandwagoning. Recently, scholars have linked its multi-vector policy to a more crowded, interdependent world, suggesting diversified engagements can continue even under rising geopolitical rivalry (Neafie et al., 2025). This literature helps explain why Kazakhstan seeks to preserve diplomatic flexibility, but it has not fully explored how that flexibility is maintained under conditions of deepening economic asymmetry with a major partner.

This gap becomes especially clear when Kazakhstan is situated within the broader literature on small states and asymmetric relationships. Scholarship on small states suggests that weaker states operate under structural constraints, possess limited room for maneuver, and are often highly vulnerable to pressure from major powers (Thorhallsson, 2018; Vaicekauskaitė, 2017). Both realist and small-state theories predict that as dependence grows, policy autonomy shrinks. At the same time, some scholars note that asymmetry may also give the weaker party stronger incentives to consolidate its position. Related studies on asymmetry and coercion show that when a weaker state lacks alternatives, asymmetric trade can become political leverage (Kim, 2019).

From this view, greater economic integration with a stronger power should increase the smaller state's exposure to pressure, spillover, and constraints. This framework is particularly useful for Kazakhstan, which has historically pursued a foreign policy designed to avoid excessive dependence on any single external actor while preserving multiple external partnerships. The literature on hedging and selective engagement, however, makes it more difficult to pin down that assumption. Hedging scholarship, especially Kuik's work, has theorized hedging as a form of insurance-seeking behavior under uncertain conditions: states avoid rigid alignment, expand partnerships, and build fallback options across the economic, diplomatic, and security domains (Kuik, 2021).

Contessi's concept of issue splitting is especially useful here because it shows how states differentiate across foreign and security issue areas rather than treating alignment as a single, all-or-nothing choice (Contessi, 2015). Through this logic, the Kazakhstani case serves as an example for why closer economic cooperation with China on infrastructure, trade, and transit can intensify, without implying that the same progress in political/ideological alignment can be replicated. Nevertheless, many accounts about hedging, omni-enmeshment, and multi-vector bargaining remain largely related to diplomatic playing fields and alignment behavior (Vanderhill et al., 2020). They are more effective at describing Kazakhstan's external posture than at explaining how deep economic integration is managed so that it does not become a broader source of political vulnerability. It is precisely here that the main gap in the literature emerges. While existing research explains Kazakhstan's external strategy in terms of prudence, balance, hedging, or multi-vector bargaining, it does not fully explain how substantial and lasting economic integration with China as part of the Belt and Road Initiative can coexist with maintaining foreign policy autonomy.

This article addresses this gap through the concept of strategic compartmentalization. Strategic compartmentalization, while drawing on and extending the logic of issue splitting, reflects the strategic separation of economic cooperation from political, norm-based, and security alignment. The argument here is that Kazakhstan does not preserve autonomy by rejecting integration with China altogether. Instead, it maintains autonomy by structuring that integration selectively: welcoming Chinese capital, transit, and connectivity where they serve national development goals, while ensuring that such ties do not become the organizing principle of Kazakhstan's broader external orientation. In this sense, strategic compartmentalization offers a clearer analytical lens for explaining how Kazakhstan can deepen BRI-related cooperation without undermining its multi-vector foreign policy.

3. METHODOLOGY

This study adopts a qualitative single-case design to examine how Kazakhstan pursued a multi-vector foreign policy while deepening its economic relations with China under the Belt and Road Initiative between 2013 and 2023. Kazakhstan was selected as a theoretically significant case because it occupies a central position in Eurasian connectivity while also pursuing a long-standing strategy of diversified external engagement. The period under examination begins in 2013, when the Silk Road Economic Belt was launched in Astana, and extends over the following decade, during which BRI-related cooperation became increasingly embedded in Kazakhstan's trade, infrastructure, and foreign policy discourse (Xi, 2013; Kassen, 2018).

The study relies solely on publicly available official documents and secondary statistical databases. It does not rely on interviews, surveys, focus groups, participant observation, or other human-subject primary data. The documentary corpus includes official materials that articulate

Kazakhstan's foreign policy priorities and external partnerships, presidential speeches, state-of-the-nation addresses, foreign policy concepts, bilateral statements, and official government documents on economic diplomacy, connectivity, and regional cooperation. This source base is appropriate because Kazakhstan's official documents consistently codify the key principles of its foreign policy, including multivectorism, balance, pragmatism, mutual benefit, sovereignty, and development.

In this respect, Kazakhstan's 2020-2030 Foreign Policy Concept is particularly relevant, as it places strong emphasis on economic diplomacy and broad geostrategic partnership-building (Web-1; Web-2). The purpose of this analysis was to examine how Kazakhstan discursively and strategically managed its relations with China without sacrificing broader foreign policy autonomy. Rather than treating Kazakhstan's China policy as a uniform alignment choice, the study examined whether official discourse distinguished economic cooperation from political and security alignment. To do so, the evidence was structured into three broad dimensions of strategic compartmentalization: discursive, structural, and strategic. The discursive dimension captured the language through which cooperation with China and the BRI was framed as economic, technical, developmental, or transit-related rather than ideological or geopolitical. The structural dimension included reference to route diversification, alternative corridors, logistics infrastructure, and actions to alleviate over-reliance on any one route.

The strategic dimension explored whether China-related cooperation was situated within a broader framework of partnerships alongside Russia, the European Union, and the United States. This enabled the study to shift from general statements of multivectorism to concrete ways in which autonomy was overtly preserved (Contessi, 2015; Sciorati, 2021; Web-1). To strengthen the explanatory basis of the study, document analysis was complemented by secondary economic and transport indicators that made it possible to trace the scale and trajectory of Kazakhstan's engagement with China over time. Trade statistics compiled by UN Comtrade and official Kazakh statistics were used to provide context for the expansion of bilateral economic ties, and World Bank materials were used to frame this in a larger narrative of trade openness, infrastructure, and corridor development.

These empirical sources were not used as standalone evidence of political influence. Instead, they played a complementary role by demonstrating the empirical significance of Kazakhstan's economic integration with China and by testing whether deeper integration was accompanied by a narrowing of external options. Given this, the quantitative element reinforces the study's key puzzle: despite growing economic links, Kazakhstan's official political rhetoric and partnership dynamics did not indicate an exclusive alignment but continued to reflect a multi-vector focus (World Bank, 2023).

The study therefore treats strategic compartmentalization as an observable process rather than a vague descriptive outcome. It does so by linking abstract theoretical claims about asymmetric interdependence to concrete indicators visible in state discourse and policy framing. If deeper reliance were accompanied by political subservience, official documents are likely to show greater exclusivity toward China, fewer references to alternative partners, and a closer fit between economic and geopolitical discourse. Instead, the analysis observes whether Kazakhstan maintained the distinction of these domains over time. This approach makes it possible to assess not only whether Kazakhstan remained multi-vector in general terms, but also how that autonomy was reproduced through repeated discursive choices, institutional positioning, and infrastructure diversification (Kim, 2019; Contessi, 2015).

This research design has several limitations. As a single-case study, it does not claim broad statistical generalizability. In addition, official policy documents reflect state discourse and may

not capture every informal bargaining process underlying foreign policy making. For the purposes of this study, however, official documents are not merely a limitation but a central source of evidence, because the key argument concerns the calculated division of spheres in Kazakhstan's external positioning, the public manner in which the state presents and coordinates its international relations is analytically significant. Combined with secondary economic indicators, this design is sufficient to identify the mechanisms through which Kazakhstan deepened BRI-related economic relations while maintaining foreign policy autonomy.

GEOECONOMIC CONTEXT OF KAZAKHSTAN'S EXTERNAL STRATEGY

Kazakhstan's external strategy is shaped by a fundamental geographic condition: it is both the world's largest landlocked state and a transcontinental country positioned between Europe and Asia. As Kassen argues, this location creates a dual reality. On the one hand, the absence of direct access to global maritime routes increases dependence on neighboring transit states and makes external market access more vulnerable to disruption. On the other hand, the same geography gives Kazakhstan an opportunity to position itself as an intermediary corridor and logistics hub across Eurasia. In this sense, Kazakhstan's multi-vector foreign policy is not merely a diplomatic choice but also a geoeconomic response to the constraints and opportunities created by its landlocked transcontinental position. This geoeconomic logic helps explain why Kazakhstan's engagement with China under the Belt and Road Initiative was proactive rather than merely reactive. Astana did not treat the BRI as an externally imposed framework, but rather as a platform that could be aligned with its domestic development priorities. In particular, Nurly Zhol was introduced as a national development strategy focused on infrastructure modernization, transit capacity, employment creation, and long-term resilience, rather than as a derivative extension of Chinese policy (Web-2).

As Kassenova (2017) notes, the complementarity between the Silk Road Economic Belt and Nurly Zhol was politically significant because it enabled Kazakhstan to embed Chinese connectivity within a domestically framed modernization agenda. This logic of domestication and selective linkage is later echoed in the 2020-2030 Foreign Policy Concept, which treats external partnerships instrumentally and links them to national development, diversification, and sovereign policy autonomy (Web-1).

In 2023, China was Kazakhstan's largest bilateral partner (trade turnover: USD 31.5 billion and 22.5% of trade), while Russia accounted for USD 26.0 billion and 18.6%, as reflected in Table 1.

Table 1. Kazakhstan's External Trade Structure with Key Partners (2023)

Partner	Trade Turnover (billion $)	Change by 2022	Share of turnover (%)
China	31.5	+30%	22.5%
Russia	26.0	-3.7%	18.6%
EU (all states)	42.6	+5%	30.5%

Source: compiled by the author based on Web-4 and Web-5

At the same time, the total for the European Union was larger than either single partner, reaching USD 42.6 billion and accounting for 30.5% of total trade. This distribution is analytically significant because it suggests that deepening economic relations with China did not displace Kazakhstan's broader pattern of diversification. Rather, Chinese growth took place within a broader external portfolio that continued to include Russia and, even more significantly, the European Union (Web-4; Web-5).

This pattern is reinforced by broader transit dynamics. Available data on the Middle Corridor indicate that, after 2022, trade flows through corridor states increased sharply, that around one-third of corridor trade consisted of transit, and that this transit was closely linked to Central Asia-Europe and China-Europe trade flows. These patterns support the argument that Kazakhstan's geoeconomic strategy is not reducible to a simple eastward shift. Instead, it uses connectivity with China to enhance Kazakhstan's role in Eurasian circulation, while preserving multiple external economic linkages (World Bank, 2023).

STRATEGIC COMPARTMENTALIZATION AS A STATE MECHANISM

From Issue Splitting to Strategic Compartmentalization

Issue splitting provides a useful starting point for understanding Kazakhstan's China policy, but it does not fully explain the logic of the case examined in this article. Contessi defines issue splitting as the diversification of foreign and security policy across issue areas rather than the pursuit of an all-or-nothing choice. In Kazakhstan's case, this helps explain why cooperation with China intensified in infrastructure, trade, and transit without producing the same degree of political or ideological alignment. However, the argument advanced here goes further. Kazakhstan not only diversified its foreign ties across issue areas, but also sought to contain the political consequences of asymmetrical economic integration by organizing different spheres of external engagement according to distinct strategic logics. For this reason, strategic compartmentalization offers a more precise description of the mechanism at work (Contessi, 2015).

This distinction matters because Kazakhstan's foreign policy is articulated not in the language of exclusive partnerships, but in the language of balance, pragmatism, and diversified cooperation. In official doctrinal terms, China is depicted as a major economic partner rather than the organizing center of Kazakhstan's overall foreign policy. This is consistent with broader research on multi-vectorism, which emphasizes Kazakhstan's use of tactical inclusion, complex balancing, and broad external engagement to reduce reliance on any single dominant actor (Web-1; Omelicheva and Du, 2018; Vanderhill et al., 2020).

Official Codification and Discursive Containment

The mechanism becomes even clearer in the evolution of official foreign policy thinking under Tokayev. The 2020-2030 Foreign Policy Concept, discussed later in the article, preserves the core principles of multi-vectorism while placing greater emphasis on economic diplomacy, pragmatic benefit, and the defense of sovereignty in a more fragmented international environment. This is significant because it suggests that the separation of economic cooperation from broader political alignment was not merely a matter of convenience. Rather, it became increasingly institutionalized within official doctrine (Web-1; Nyshanbayev et al., 2024).

A further component of this mechanism is discursive containment. Official materials consistently link Kazakhstan's relationship with China to trade, transport, logistics, investment, and development, rather than to ideological affinity or exclusive geopolitical identification. This is consistent both with broader discourses framing the BRI as an open and inclusive form of

international economic cooperation and with Kazakhstan's own preference for depoliticized, development-oriented language in its engagement with Chinese initiatives. At the same time, discourse on sovereignty, security, and broader regional balance remains distributed across a wider constellation of relationships rather than being folded into a China-centered narrative (Liu et al., 2018; Sciorati, 2021; Xi, 2013).

Taken together, these patterns show why strategic compartmentalization should be understood as a state mechanism rather than a descriptive label. It is visible in the selective institutionalization of partnerships, the differentiated language of official doctrine, and the separation between corridor-building and political alignment. In this sense, Kazakhstan's China policy is neither simple accommodation nor simple balancing, but a managed division of external engagement into spheres that maximize gains while limiting spillover (Contessi, 2015; Web-1; Sciorati, 2021).

Voting Patterns in the UN General Assembly as Evidence of Strategic Autonomy

One of the clearest ways to assess whether economic integration translated into political alignment is to examine Kazakhstan's behavior in multilateral voting. United Nations General Assembly voting is particularly useful for this purpose because it captures how states position themselves on politically sensitive issues under conditions of competing external pressures. If deeper economic engagement with China had generated straightforward political dependence, one would expect Kazakhstan's voting behavior to display a more consistent pattern of convergence with Beijing across major international disputes. The available evidence, however, points to a more selective and differentiated pattern. Yuneman's analysis of UNGA voting between 2007 and 2022 shows that Kazakhstan's main extra-regional voting vector was China rather than Russia, yet this did not amount to stable one-vector alignment (Yuneman, 2023).

As Table 2 shows, Kazakhstan's voting alignment with China remained consistently high, rising from 81 percent in 2014 to 89 percent in 2022.

Table 2. Consistency of Kazakhstan's votes in the UN General Assembly (in %)

Year	China	Russia	Germany (EU)	USA
2014	81%	64%	59%	21%
2018	84%	72%	61%	15%
2022	89%	62%	68%	25%

Source: adapted from Yuneman (2023)

This exceeded its voting cohesion with Russia across all three years, despite Russia's formal status as Kazakhstan's closest security ally. To be sure, however, this trend should not be considered proof of an automatic political allegiance to Beijing. Instead, it complicates any simple assumption that Kazakhstan's foreign policy should reflect either formal alliance commitments with Russia or the expansion of economic relations with China. What the voting record reveals instead is a hierarchy of relationships that is real but not absolute, and therefore inconsistent with political subordination to any single external actor (Yuneman, 2023).

The strongest evidence of preserved autonomy lies not in aggregate cohesion scores alone, but in Kazakhstan's handling of contentious resolutions on which major powers took directly opposing positions. Yuneman shows that Kazakhstan abstained on Resolution 68/262 on the territorial integrity of Ukraine, avoided Syria-related resolutions after 2013, and continued this pattern after Russia's full-scale invasion of Ukraine by withholding blanket support for Moscow on key UNGA resolutions. This suggests that abstention was not a sign of passivity but rather a strategic instrument of hedging. It allowed Astana to avoid directly confronting its key partners while also resisting pressure to align fully with their most politically costly positions (Yuneman, 2023).

This interpretation is further reinforced by issue-specific variation in Kazakhstan's voting behavior. Yuneman notes that Kazakhstan most commonly aligned with China on issues of armed conflict resolution, disarmament, and development, while its overlap with Russia was more evident in human rights and decolonization. This matters because it shows that Kazakhstan's multilateral behavior was not organized around a single geopolitical center. Instead, it varied across issue areas, which is exactly what one would expect from a state seeking to preserve room for maneuver through selective alignment. In that sense, UNGA voting provides strong evidence for the strategic dimension of compartmentalization: economic relations with China deepened, while political behavior remained differentiated, issue-specific, and carefully constrained (Yuneman, 2023).

This broader pattern is consistent with Kazakhstan's behavior after 2022. Arynov and Yesdauletova et al. show that Tokayev refused to recognize the self-proclaimed Donetsk and Luhansk entities and adopted a cautious stance on the war in Ukraine, seeking to avoid both overt defiance of Russia and full alignment with Moscow. Other analyses describe this approach as cautious neutrality rather than a full geopolitical shift, noting Kazakhstan's simultaneous efforts to preserve relations with Russia, deepen engagement with the European Union, and manage the risks of sanctions spillover. Taken together, these patterns suggest that Kazakhstan's political behavior under pressure remained selective and strategically calibrated, even as its economic ties with China and Russia continued to deepen (Arynov, 2022; Yesdauletova et al., 2024; Neafie et al., 2025).

The significance of this evidence extends beyond voting behavior itself. The UNGA evidence suggests that Kazakhstan's multilateral behavior is guided more by a persistent preference for flexibility, differentiation, and controlled distance than by bloc discipline. Under Tokayev, this was not merely a situational response to crisis. It also became increasingly visible in the institutional language of foreign policy, most clearly in the 2020-2030 Foreign Policy Concept, which retained the logic of multivectorism while placing greater emphasis on economic diplomacy, regional leadership, and broad geostrategic partnerships. The next section examines how this strategic autonomy was codified and economically re-articulated at the doctrinal level (Yuneman, 2023; Web-1; Nyshanbayev et al., 2024).

Institutional Evolution under Tokayev: The 2020-2030 Foreign Policy Concept

Kazakhstan's external orientation did not fundamentally rupture during the transition from Nursultan Nazarbayev to Kassym-Jomart Tokayev. On the contrary, the 2020-2030 Foreign Policy Concept explicitly anchors itself in continuity, identifying the preservation of Nazarbayev's foreign-policy line as a basic principle while adapting Kazakhstan's diplomatic instruments to what the document describes as long-term realities. The rationale for adopting the new concept was precisely the need to adjust foreign-policy views and instruments to a changing international environment marked by intensifying geopolitical and geo-economic competition, sanctions

standoffs, technological change, and the growing vulnerability of medium and small states. At the doctrinal level, therefore, Tokayev's foreign policy did not abandon multivectorism, but rearticulated it in a more self-consciously strategic and economically instrumental form. The Concept defines Kazakhstan's policy as multi-vector, proactive, and pragmatic, linking it directly to the defense of national interests, the country's openness to the external world, and the inseparable connection between security and development (Web-1).

This combination of continuity and change is also how Tokayev's period is interpreted in the scholarly literature. As Nyshanbayev et al. argue, Kazakhstan's foreign policy under Tokayev entered an unprecedented phase in which geo-economic considerations gained increasing significance without dismantling the underlying multi-vector structure. The two pillars of national security and economic development are also retained in the new Concept. Kazakhstan's self-presentation also shifted, moving away from the image of an integration-oriented state toward a more explicit claim to regional leadership. In their interpretation, this is not merely a symbolic adjustment. Rather, it reflects an evolving policy aimed at expanding broad geostrategic partnerships with China, Russia, the United States, the European Union, and Central Asian neighbors simultaneously, while making diplomacy more directly subordinate to modernization, competitiveness, and material interests (Nyshanbayev et al., 2024).

The official text of the Concept supports this interpretation. Its objectives include strengthening sovereignty and foreign-policy independence, consolidating Kazakhstan's position as a leader in Central Asia, establishing the country as an active and responsible member of the international community, maintaining predictable and mutually beneficial relations with foreign states, increasing the competitiveness of the national economy, and placing the practical interests of citizens and national business at the center of foreign policy. This is an important change in focus. The Concept no longer treats external relations merely as an instrument of balancing among great powers - rather, it presents foreign policy more explicitly as a means of generating observable domestic benefits. In this way, the document institutionalizes a form of strategic compartmentalization: external partnerships are valued not as ends in themselves, but insofar as they advance sovereignty, growth, diversification, and room for maneuver (Web-1).

This is most visible in the Concept's expanded economic-diplomacy agenda. Instead of listing the fourteen priorities in isolation (i.e., as a separate inventory), we can organize them into three complementary clusters. The first cluster concerns sovereignty and regional status: maintaining independence, strengthening Kazakhstan's status as a leading power in Central Asia, and advancing its long-term national interests through foreign policy. The second cluster concerns external economic upgrading: promoting national firms abroad, directing foreign capital into non-resource sectors, and integrating the most competitive segments of Kazakhstan's economy into regional and global trade networks. The third cluster concerns integration and connectivity: turning Kazakhstan into a transcontinental transit and logistics hub on East-West and North-South routes through the potential of Nurly Zhol and foreign infrastructure initiatives, strengthening energy security through diversified export routes, promoting the Astana International Financial Centre, supporting the WTO-based trading system, contributing to regional food security and participating in official development assistance. Taken together, these priorities show that Tokayev's Concept does not simply economicize diplomacy - it embeds economic diplomacy within a broader doctrine of state resilience through diversification (Web-1; Nyshanbayev et al., 2024; Web-2).

This matters directly for the article's central argument. If deepening ties with China under the Belt and Road Initiative had pushed Kazakhstan toward one-vector dependence, one would expect the 2020-2030 Concept to elevate China into a privileged organizing principle. Instead, the document establishes a framework in which China appears as one important partner within a

broader geostrategic architecture that also includes Russia, the EU, the US, Central Asia, and international organizations. The Concept's language is non-exclusive in practice: it focuses on friendly, equal, and mutually supportive relations with all states and organizations of practical interest to Kazakhstan, and it does not systematically tie national development to any external vector. This reinforces the broader pattern already visible in Kazakhstan's voting record and geo-economic diversification. Under Tokayev, autonomy was defended not by reducing external engagement, but by widening, and in some cases, institutionalizing it (Web-1; Nyshanbayev et al., 2024).

The implementation design of the Concept further supports this interpretation. While the document gives the Ministry of Foreign Affairs a key role, it explicitly states that foreign policy is to be implemented through intergovernmental commissions, state bodies, and the coordination of diplomacy and foreign economic policy, all of which are updated every two years. Its anticipated outcomes are framed in practical terms: greater independence, a more favorable external environment, deeper integration into the world economy through diversification and digitization, and stronger protection of citizens and businesses abroad, ultimately generating concrete benefits for the state, national business, and the people of Kazakhstan. This is analytically significant because it suggests that Tokayev-era multivectorism was formalized not only as a balancing doctrine, but also as a governance framework for transforming external relations into a controlled domestic advantage. In this sense, the 2020-2030 Concept represents the clearest doctrinal expression of strategic compartmentalization in the period under study: it preserves the plural external structure of Kazakhstan's foreign policy, while making economic diplomacy the principal instrument through which that autonomy is reproduced (Web-1).

THE MIDDLE CORRIDOR AS AN INSTRUMENT OF STRUCTURAL DIVERSIFICATION

Kazakhstan's shift toward the Trans-Caspian International Transport Route (TITR), or the Middle Corridor, is better understood as part of a broader strategy of route diversification than as a short-term response to the events of 2022. Kassen emphasizes that Kazakhstan's landlocked and transcontinental position makes external connectivity a foreign-policy imperative, while Kassenova shows that Astana has long sought alternatives to excessive reliance on Russian-controlled access to European markets. In this context, Kazakhstan's engagement with TRACECA and its interest in trans-Caspian energy and transport options reflected a long-term effort to expand the country's external access beyond the northern vector (Kassen, 2018; Kassenova, 2017).

The strategic importance of the Middle Corridor increased sharply after Russia's invasion of Ukraine. According to the World Bank, the corridor gained new momentum in 2022 as shippers sought to reduce dependence on routes crossing Russian territory. The report is careful not to overstate the corridor's maturity - before the war, the northern route through Russia and Belarus accounted for the overwhelming majority of China-Europe land traffic, while the Middle Corridor represented only a much smaller share. Its relevance, therefore, lies not in replacing the northern route, but in creating a credible alternative that reduces Kazakhstan's exposure to single-route vulnerability. This is precisely what makes the corridor analytically important for the argument of this article (World Bank, 2023).

Recent scholarship strengthens this interpretation by showing how corridor-centered interdependence reshapes Kazakhstan's external behavior in increasingly selective ways. Shakirova, Parpiyev, and Sultanmuratov argue that the development of the Middle Corridor increases Kazakhstan's engagement with transit nodes through pragmatic, performance-oriented diplomacy, while also encouraging cautious and legally framed positioning in politically sensitive regional settings. Their central contribution is especially relevant here - they interpret these

patterns through multi-vector hedging and complex balancing, producing what they describe as a domain-specific vector hierarchy. In other words, corridor functionality can become a priority without implying political alignment. This formulation aligns closely with the logic of strategic compartmentalization, showing how Kazakhstan can prioritize a transport route and its associated economic relationships without allowing those ties to dictate its broader foreign-policy orientation (Shakirova et al., 2026).

The Middle Corridor also matters, because it embeds Kazakhstan within a broader stakeholder landscape. According to World Bank materials, the route connects Kazakhstan not only to China, but also to Azerbaijan, Georgia, Türkiye, and the European Union - at the same time, its effectiveness depends on customs harmonization, digitalized border procedures, and soft-integration measures alongside physical infrastructure. This indicates that the TITR is not merely a bilateral Kazakhstan-China channel. Rather, it is a multi-actor framework in which Chinese connections can remain economically valuable without becoming institutionally exclusive. The more actors acquire a stake in Kazakhstan's transit role, the stronger Astana's bargaining position becomes vis-a-vis any single partner (World Bank, 2023).

In this light, the Middle Corridor should not be read as evidence of an east-to-west geopolitical shift. It is better understood as an instrument of structural diversification. By expanding the country's range of routes, partners, and logistical options, Kazakhstan reduces the risk that any single external actor or transit route can dominate its geoeconomic orientation. Accordingly, the corridor supports the article's argument that Kazakhstan did not respond to asymmetry by disengaging from China, Russia, or other countries - rather, it reduced vulnerability through improved infrastructure and diplomatic alternatives. From this perspective, the TITR represents a concrete expression of structural compartmentalization: economic integration deepens, but within a broader architecture designed to preserve autonomy (World Bank, 2023; Shakirova et al., 2026; Kassenova, 2017).

CRISES AS CATALYSTS OF RECALIBRATION

Regional crises were not merely tests of Kazakhstan's multi-vector foreign policy - they also accelerated its recalibration. The 2014 crisis in Ukraine was the first major stress test of Kazakhstan's ability to preserve external flexibility under conditions of intensified polarization. As Neafie, Amanbaiuly, and Akhmer argue, Kazakhstan did not respond by collapsing into a polarized binary alignment with either Russia or the EU. Rather, it continued to pursue its own interests, while diversifying partnerships and supply routes in order to preserve its economic standing. In this sense, the post-2014 period showed that multivectorism could withstand external pressure - not through the avoidance of difficult political choices, but through the widening of the state's external options (Neafie et al., 2025).

The crises of 2022 were more severe and more consequential. Following the January unrest and the CSTO's temporary deployment, there was widespread concern that Kazakhstan's autonomy would shrink and that its dependence on Russia would deepen. These fears were further intensified by Russia's subsequent invasion of Ukraine. The available evidence, however, points to a different outcome. Arynov notes that, despite early speculation about the end of multivectorism, Kazakhstan's foreign policy acquired even more visible contours after 2022. Yesdauletova et al. similarly show that Astana supported neither side and instead emphasized peace, reaffirmed respect for Ukraine's territorial integrity and for decisions grounded in the United Nations, and sought to preserve neutrality while adapting to a more unsettled geopolitical environment. At the same time, domestic developments revealed greater sensitivity to questions

of sovereignty and greater political distance from Moscow than had been visible in 2014 (Arynov, 2022; Yesdauletova et al., 2024).

Taken together, the crises of 2014 and 2022 did not invalidate Kazakhstan's strategy of compartmentalization. After 2014, sovereignty and diversification became more prominent as safeguards against involvement in great-power confrontations. The same logic was sharpened after 2022 through selective neutrality in diplomacy, greater emphasis on route diversification, and the institutionalization of a more economically driven foreign policy under Tokayev. As Nyshanbayev et al. indicate, the Tokayev period did not abandon multivectorism, but rather institutionalized it more firmly and oriented it toward geo-economics. Crises, therefore, were not moments of strategic collapse but catalysts that exposed new vulnerabilities and pushed Kazakhstan to adapt its multi-vector foreign policy to a more adversarial regional environment (Nyshanbayev et al., 2024; Neafie et al., 2025; Arynov, 2022).

4. CONCLUSION: THE RESILIENCE OF STRATEGIC COMPARTMENTALIZATION

This article has argued that Kazakhstan's deepening economic engagement with China under the Belt and Road Initiative did not result in straightforward political dependence. Instead, Kazakhstan pursued a policy of strategic compartmentalization, through which it preserved foreign policy autonomy between 2013 and 2023 by consciously separating economic cooperation from political, normative, and security alignment. This finding diverges from conventional expectations derived from asymmetric interdependence, which would normally predict that expanding relations with a stronger power will narrow the policy space of the weaker state. In the Kazakhstani case, however, economic integration was not merely accommodated, but actively structured to safeguard diplomatic flexibility and preserve the country's broader multi-vector orientation (Kim, 2019; Contessi, 2015).

The analysis showed that this strategy operated across several interrelated dimensions. At the discursive level, cooperation with China and the BRI was framed primarily in developmental, technical, and transit-related terms, rather than as a basis for political alignment. At the structural level, Kazakhstan expanded alternative routes and logistical options, most clearly through the Trans-Caspian corridor, in order to reduce excessive reliance on any single transport route. At the strategic level, Kazakhstan's voting behavior in the UN General Assembly and its broader diplomatic posture reflected selective alignment, repeated abstention, and calibrated neutrality on politically divisive issues, with little evidence of automatic loyalty to either Beijing or Moscow. Taken together, these patterns suggest that China's economic role expanded within a broader external portfolio that continued to include Russia, the EU, the United States, and regional partners (Sciorati, 2021; World Bank, 2023; Yuneman, 2023).

A further contribution of the study is to show that this pattern was not merely reactive. The concept of strategic compartmentalization was institutionalized more clearly under Tokayev in the 2020-2030 Foreign Policy Concept. The Concept preserved the core principles of multivectorism and continuity, but recast them in more explicit terms of economic diplomacy, regional leadership, diversification, and pragmatic national interest. In this sense, Kazakhstan's foreign policy did not become weaker as economic integration deepened - rather, autonomy was reproduced through an increasingly economic and implementation-oriented diplomatic framework (Web-1; Nyshanbayev et al., 2024).

This suggests that small and medium states are not always passive recipients of asymmetrical dependence. Under certain conditions, they can use economic interdependence when it is embedded in diversified partnerships, alternative infrastructures, and carefully managed

official narratives. Kazakhstan's experience suggests that the durability of this model depends on its ability to balance expanding ties with China against the maintenance of broader institutional, diplomatic, and economic linkages. The evidence from 2013-2023 suggests that, so far, strategic compartmentalization has enabled Kazakhstan to convert integration into resilience rather than subordination (Thorhallsson, 2018; Haugevik and Rieker, 2017; Kim, 2019).

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Financial Technology Adoption and Bank Stability: Evidence from Listed Commercial Banks in Jordan

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Abstract

This study examines the impact of financial technology (Fintech) adoption on the stability of banks in Jordan. The analysis is based on panel data from 13 listed commercial banks covering the period from 2014 to 2024. A panel Generalized Method of Moments (GMM) regression approach is employed to assess the relationship between Fintech adoption, proxied by a Fintech index, and bank stability. The model controls several bank-specific factors, including efficiency, profitability, bank size, liquidity risk, and dividend payout ratio, as well as key macroeconomic variables such as GDP growth and inflation. The Fintech index is constructed using text mining techniques applied to information extracted from banks' annual reports. This study contributes to the literature by providing empirical evidence on the role of Fintech adoption within the Jordanian banking sector. The results suggest that Fintech integration can play an important role in improving banking stability and highlight the significance of technological innovation for strengthening the resilience and strategic development of financial institutions in Jordan. The robustness checks confirm the stability and reliability of the estimated results.

Inflation Determinants in Kazakhstan: Beyond Conventional Monetary Policy

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Introduction and Problem Statement

Kazakhstan's economy is characterized by high import dependence (40–50% originating from Russia) and extreme exposure to external shocks. Despite the National Bank's efforts, traditional monetary tools remain ineffective, often described as "hitting the economy with a hammer." This study addresses the policy mismatch where high interest rates stifle domestic production without curbing imported inflation or exchange rate pass-through (ERPT).

Research Objectives

This research aims to:

Decompose monthly inflation drivers, specifically measuring the ERPT from USD/KZT and RUB/KZT fluctuations.

Evaluate the "Credit Divergence" by analyzing how corporate versus individual lending impacts price levels across different maturities.

Propose a strategic pivot from reactive stabilization toward structural import replacement.

Methodology

Utilizing a 19.5-year monthly dataset (2004–2024), the study employs time-series regression with distributed lags. The model incorporates imported inflation indicators (CIS vs. Global), oil prices, and segmented credit data (Legal Entities vs. Individuals).

Expected Contributions
The study anticipates finding that the USD exchange rate is the primary inflation driver

Performance Management of Sovereign Wealth Fund: Lessons from Norway to Kazakhstan

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Abstract

This paper asks a simple but consequential question: does it matter how a sovereign wealth fund is governed and how its assets are invested? To answer it, we compare two oil-revenue-backed funds with identical founding principles — Norway's Government Pension Fund Global (GPFG) and Kazakhstan's National Fund of the Republic of Kazakhstan (NFRK) — over the period 2000 to 2023. The comparison is instructive because the two funds began from the same institutional template yet have diverged sharply: the GPFG has grown into the world's largest investment fund, while the NFRK has experienced persistent underperformance and asset depletion. Using annual data for governance analysis and monthly data for volatility modelling, we test three hypotheses through different econometric procedures — stationarity and cointegration testing, Granger causality, GARCH-M, System GMM with endogeneity correction, and Kalman Filter state-space estimation. All three hypotheses are supported. The GPFG earns a risk-adjusted return premium over the NFRK, compounding to a 2.25-times terminal wealth advantage over 24 years. Governance quality and asset diversification causally and significantly drive this gap. Six policy reforms, each grounded in specific findings, are recommended for Kazakhstan.

Keywords: *Sovereign wealth funds,* Governance quality, *Asset diversification*

Testing the Zero-Beta Capital Asset Pricing Model: Evidence from S&P 500 Stocks (1995-2025)

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Abstract

This paper tests the Zero-Beta Capital Asset Pricing Model (ZCAPM) proposed by Kolari et al. using data from S&P 500 stocks between 1995 and 2025. This paper tests the Zero-Beta Capital Asset Pricing Model (ZCAPM) using S&P 500 stock data from 1995 to 2025. We apply Expectation-Maximization algorithm for to estimate market beta and dispersion risk parameters for 503 current stocks and 645 delisted stocks. Total sample includes 1,148 stocks which helps us to avoid survivorship bias problem.

Results show strong support for ZCAPM. Cross-sectional regressions give adjusted R^2 of 86.71% for 25 size and book-to-market portfolios, which is close to 94% that Kolari et al. found in their broader market sample. Dispersion risk premium is large and significant - monthly premium equals 4.78% with t-statistic of 11.89. This t-statistic is much higher than 3-6 range reported in earlier ZCAPM studies. We also find that dispersion risk is significant in 9 out of 10 size portfolios, showing that cross-sectional pricing is robust.

When we compare ZCAPM with other models, we see that it explains cross-sectional returns better than CAPM (R^2=2.67%), Fama-French three-factor model (56.90%), Fama-French five-factor model (56.90%), and Carhart four-factor model. Model does not produce significant pricing errors across test portfolios. These findings extend Kolari's work to homogeneous sample of large-cap stocks and show that dispersion risk is important pricing factor even for S&P 500 stocks that have similar characteristics.

Results are important for both theory and practice. They confirm that dispersion from zero-beta portfolio is systematic risk factor which is priced in stock market, as predicted by Black's zero-beta CAPM theory. For portfolio managers and practitioners, ZCAPM offers simple two-factor model to understand why different stocks have different expected returns. This can be useful for portfolio construction and performance evaluation.

However, our out-of-sample tests show different picture. When we use rolling window approach, the dispersion factor becomes insignificant (t-statistic = 1.46, p-value = 0.145). Also, the time-series R^2 of ZCAPM (58.79%) is lower than Fama-French five-factor model (66.91%) and Carhart four-factor model (67.17%). This means that good cross-sectional fit does not guarantee good prediction of future returns.

We conclude that ZCAPM works well for explaining why some stocks have higher average returns than others (cross-sectional question), but it does not work as well for predicting future returns (time-series question). This is important finding because it shows that ZCAPM and traditional factor models like Fama-French are useful for different purposes. Researchers should use ZCAPM when they want to understand cross-sectional differences in returns, but should use Fama-French models when they need to predict or hedge returns in practice.

Keywords: Zero-Beta CAPM, Dispersion Risk, Cross-Sectional Asset Pricing, Expectation-Maximization Algorithm, S&P 500

Experts' assessment of the banks' financial sustainability factors in Kazakhstan

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Abstract. The rise of sustainable finance, which involves financial tools operating within the framework of environmental, social, and governance principles adopted by companies and financial institutions, is gaining traction in major global markets. According to the Global Alliance for Sustainable Investments, these approaches already account for 35.9% of total invested assets. This trend is driven by a new global reality in which long-term development cannot occur without addressing deepening environmental and social contradictions. The article aims to assess the priority of banks' ESG as a sustainable finance factor in developing the recommendations. Assessing ESG principles in the country's banks enables identification of further directions for sustainable finance development. Furthermore, this article examines the experiences of leading countries with environmentally and socially responsible investment and its role in the banking system, revealing both common and specific features that could be effectively implemented in Kazakhstan. The research methodology entails expert assessments at the middle-management level of banks of the ESG impact of 9 factors using the AHP method. The AHP method enables investors to systematically compare and prioritize ESG factors, thereby assessing their significance as indicators of the state and prospects of ESG principles implementation in the bank's activities in Kazakhstan. The results obtained suggest that the priority instruments for ESG promotion in the country are a legislative framework and a state program. The study illustrates that integrating ESG factors into banks' sustainable development strategies contributes to asset growth by increasing demand for sustainable products and attracting new customers. The findings have practical implications for banks related to sustainable finance and ESG criteria-based investing.

Keywords. Sustainable finance, ESG, decarbonization, banks, experts' assessment

Measuring Customer Acquisition Cost (CAC) in Mobile Marketing: Evidence from Emerging Markets

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This study examines how Customer Acquisition Cost (CAC) is measured in mobile marketing within emerging markets. In recent years, mobile marketing has become one of the

main channels companies use to attract new customers due to the rapid increase in smartphone usage and mobile internet access. Businesses use mobile applications, social media platforms, and targeted advertising to reach consumers more directly. However, measuring CAC in these environments remains challenging, especially in emerging markets where data availability and digital systems are often limited.

The study is based on a systematic literature review. This method allows analyzing existing academic studies in a structured way and identifying the most common approaches used to measure CAC. The review focuses specifically on research related to mobile marketing performance, customer acquisition metrics, and emerging market conditions.

Customer Acquisition Cost is a key metric that reflects how much a company spends to acquire one customer. It is typically calculated by dividing total marketing and sales costs by the number of new customers. In mobile marketing, this calculation becomes more complex because customers interact with multiple channels before making a purchase. For example, a user may first see an Instagram advertisement, then click on a mobile ad, install an app, and only later complete a purchase.

To measure CAC in such cases, companies use several specific metrics. Cost Per Install (CPI) measures how much it costs to generate an app download, but it does not indicate whether the user becomes an active customer. Cost Per Acquisition (CPA) mmeasures the cost of actions such as purchases or subscriptions, which better reflect real customer conversion. Cost Per Lead (CPL) focuses on collecting potential customer information. These metrics allow companies to evaluate which stage of the customer journey generates the highest costs and where inefficiencies occur.

Another important method used in practice is attribution modeling. Attribution models help identify which marketing channels contribute most to customer acquisition. For example, single-touch models assign all value to one interaction, while multi-touch models distribute value across several steps in the customer journey. However, these models can produce inaccurate results when tracking systems are incomplete or when user data is missing, which is common in emerging markets.

The study also analyzes key factors that influence CAC in emerging markets. One of the main factors is the level of digital infrastructure. In many countries, internet speed, mobile coverage, and access to digital services are still developing, which reduces campaign performance and increases costs. Another important factor is consumer trust. Users may interact with ads but avoid making payments due to low trust in online systems, which leads to lower conversion rates and higher CAC.

In addition, the study evaluates the effectiveness of mobile marketing compared to other digital channels. Mobile marketing allows companies to use personalized ads, real-time

communication, and location-based targeting, which can improve engagement. However, the literature shows that without proper tracking tools, companies cannot clearly determine whether mobile marketing actually reduces CAC compared to channels such as search or desktop advertising.

Conclusion

The findings of this study show that measuring CAC in mobile marketing requires more precise and consistent methods, especially in emerging markets where data limitations are common. The results indicate that commonly used metrics such as CPI, CPA, and CPL capture different stages of the customer journey but do not always reflect actual customer value. It was also found that weak digital infrastructure and low consumer trust significantly increase CAC. While mobile marketing can improve customer engagement, its real impact on reducing CAC depends on accurate measurement and data quality. Therefore, future research should focus on developing more reliable methods and adapting CAC measurement to the specific conditions of emerging markets.

Mapping City Branding and City Image Research: A Bibliometric Analysis and Future Research Agenda for Central Asia and Kazakhstan

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ABSTRACT

City branding and city image have become central constructs in understanding how cities attract tourists, talent, and investments. In this paper, the authors describe their approach to investigating articles on city branding and city image. The study used a visual approach, selecting and implementing VOSviewer to review research on city branding and city identity. The authors conducted a bibliometric analysis and presented it visually. Despite significant development in the literature stream, Kazakhstan, Central Asia, and the CIS region remain underexplored in research. This approach enables systematic mapping of the field's intellectual landscape. The analysis found low representation of concepts such as sustainable city and sustainability in connection with city branding, and minimal research focused on smart cities and digitalization. Results also showed a low level of geographical representation of Kazakhstan and Central Asia, especially in city branding studies. The paper proposes Central Asia as a promising but underexplored area for advancing city branding scholarship.

KEYWORDS: VOS viewer, bibliometric analysis, city branding, city image, Central Asia, Kazakhstan

1. INTRODUCTION

In the modern world, cities are no longer considered merely geographic units, but strategic units that compete for the attraction of tourists, investments, talent, and events of international scope. This trend highlighted the importance of city branding and city image as central concepts in the development of urban places' presentation on the global arena (Simon Anholt, 2007). City branding refers to substantial activities of municipalities to build a distinct brand identity, while city image highlights the perceptions of citizens, tourists, and other stakeholders. Over the past two decades, significant development has led to a multidisciplinary domain integrating tourism, geography, urban studies, and related fields. Scholars have written articles on the connections between city branding and city image and governance, urbanism, and management (Gregory Ashworth & Mihalis Kavaratzis, 2010). Despite the increasing number of publications, the field is considered fragmented. Bibliometric analysis offers a structured approach to mapping the scientific studies and revealing thematic trends. Visualization tools such as VOSviewer software help scholars analyze patterns and research clusters, thereby providing a comprehensive overview of research domain evolution (Chen, 2017). The objective of this research is to systematically map and analyze developments in city branding and city image scholarship, with a specific focus on underrepresented regions such as Kazakhstan, Central Asia, and the CIS region, and to identify emerging research directions using bibliometric methods. The bibliometric analysis is helpful in creating a map of an intellectual field in structured way. Though earlier studies have been published in this area (Gönüllüoğlu, 2025; Lessa *et al*., 2025; Ma *et al.,* 2019), the authors sought

to explore whether recent research has been conducted on city branding and city image in the CIS, Central Asian region, and Kazakhstan.

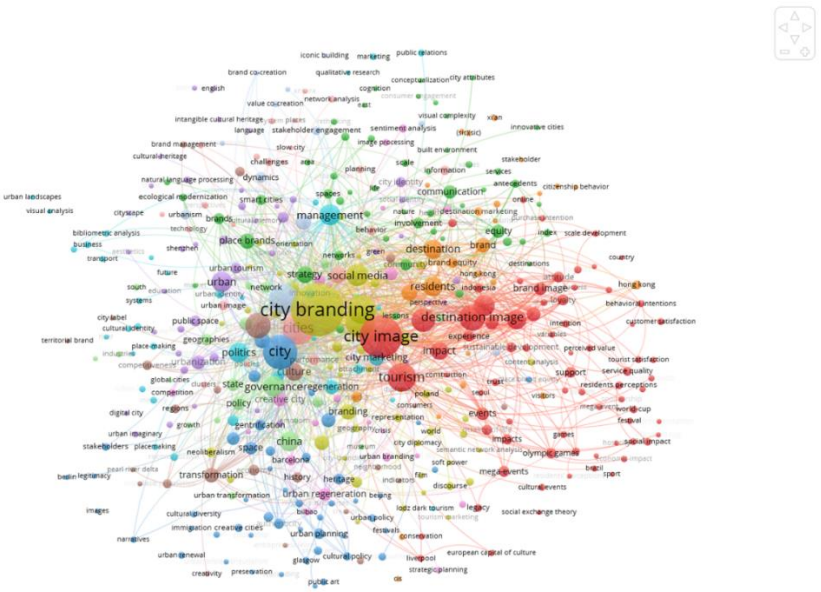
2. METHODOLOGY

VOS viewer is software for creating accessible maps from bibliographic data (van Eck and Waltman, 2010). The tool can quickly generate images. The software's maps let scholars see which ideas are most studied in the context of city branding and city identity, and which new research directions have emerged recently. Researchers can use it to understand developments and new directions in the field. The authors chose the Web of Science database for analysis. This database features high-quality, peer-reviewed academic publications. They retrieved and analyzed studies on city brand and city image published from 2011 to 2026. Due to database retrieval constraints, only the first 1000 articles were analyzed. The journals reviewed covered several disciplines. These included Place Brand and Public Diplomacy, Journal of Product and Brand Management, Marketing Theory, Cities, and International Review of Management and Marketing. The selection aimed to explore research on city image and branding across fields. The bibliometric approach was used to investigate publication trends, thematic clusters based on keywords and abstracts, evolution of research themes, and the geographic distribution of studies (Donthu *et al.* 2021). The visual results are presented in the findings section. The analysis focused on English-language articles to identify topic trends, thematic clusters, theme evolution, and the geographic representation of cities in the studies.

3. FINDINGS

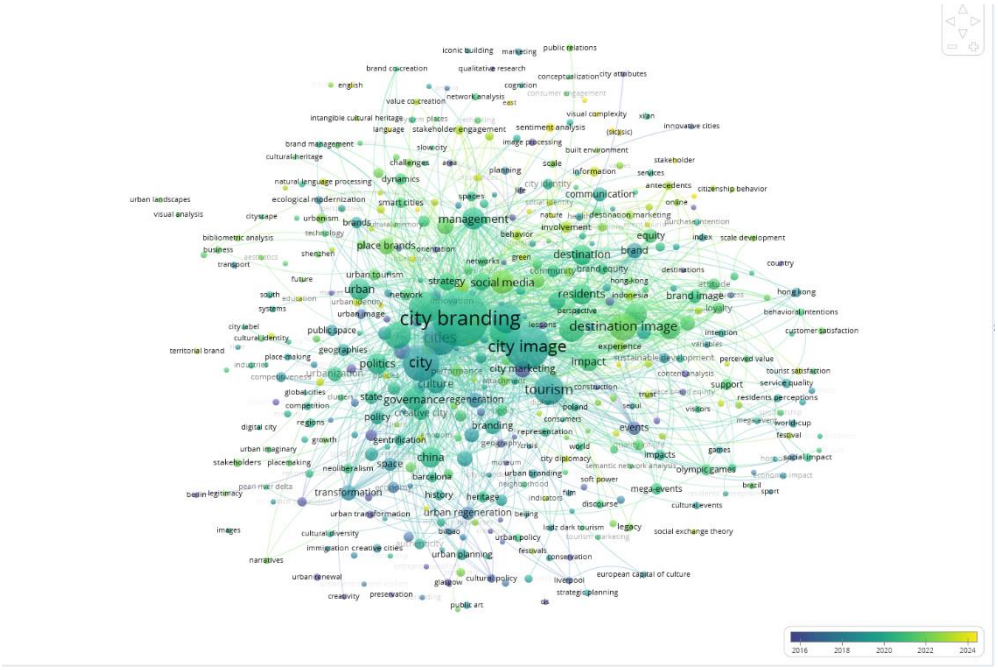
The two key words used in the analysis were city branding and city image. The analysis revealed main research clusters: cities, tourism, destination image, and management. All are connected to the two main concepts. New research areas include governance and analysis methods, such as semantic and sentiment analysis, across different clusters. Figure 1 shows the links among the concepts investigated in relation to city branding and city image. Several main research clusters are visible. City branding is the main concept and dominates the studies; it extends to all clusters. City image is closely linked to destination image and serves as the basis for the tourism cluster. There is a strong research stream on city governance. Geographical representation includes studies on European cities, and many articles focused on China. There is little research on cities from Kazakhstan and Central Asia.

Figure 1: City branding and City image: Network visualization



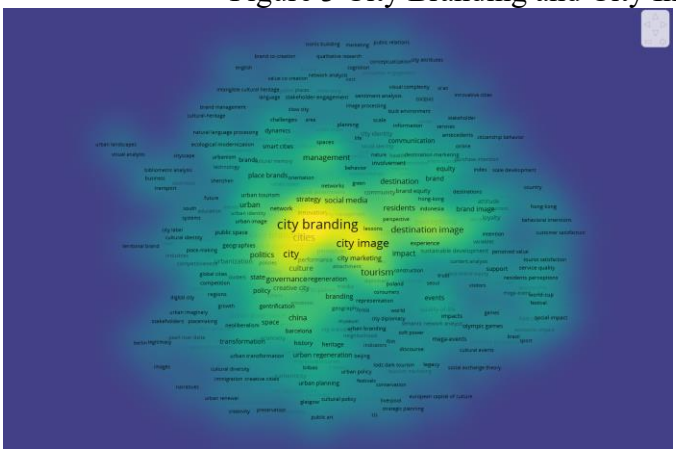
The analysis showed a large increase in research output over the past two decades. There was especially rapid growth after 2016, followed by a notable acceleration after 2020. New sub-themes are emerging. This trend shows the rising importance of nation and city branding globally.

Figure 2: City Branding and City Image development of themes over the years



From figure 3 we can see the density of two main concepts studies and the trend of connected concepts related as destination image and city.

Figure 3 City Branding and City Image. Density



4. CONCLUSION

The study conducted a bibliometric analysis on key search words, city branding, and city image. The study had limitations as it included the first 1000 articles and conference proceedings from the Web of Science database covering the 2011-2026 period. The results of the bolometric analysis demonstrated rapid development of the field over the last two decades. The main clusters identified were related to tourism and urban development. The latest trends have been identified in connecting city image with social media, smart and green cities, and urban tourism. The destination image concept appears to have developed more rapidly over the last few years, while the brand image has replaced the city image concept. There are underexplored areas of research identified as sustainability and digitalization, and their connection to city image and city branding concepts. From the bibliometric analysis, it can be observed that Central Asia and Kazakhstan are underrepresented in the field of city image and destination branding. Future studies could explore this geographic region and conduct a bibliometric analysis of city branding and city image in the field of sustainability.

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Digital Skills and Subjective Wellbeing: Wired for Happiness?

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Abstract

This study examines the relationship between digital skills and subjective wellbeing in Central Asia and the Caucasus using data from the Life in Transition Survey IV (N = 5,086). The findings demonstrate that digital skills are positively associated with subjective wellbeing, although the strength of this relationship varies across countries. Digital skills emerge as particularly significant contributors to life satisfaction in Kazakhstan and Armenia, suggesting that higher levels of national digitalization are associated with more advanced digital skills among the population. In addition, the analysis reveals a notable difference in life satisfaction between public sector employees and those outside the public sector, a gap that is largely explained by differences in digital skills.

Key words: *digital skills, Central Asia, Caucasus, digitalization, subjective wellbeing, life satisfaction*

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The Securitisation of Migrants in Russia

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Since 2024, the securitisation of migrants in Russia has rapidly accelerated, with the State Duma continuing to pass laws in 2026 increasing the digital surveillance of migrants and restrictions on their access to public services. This trend was catalysed by the terrorist attacks at Crocus City Hall, Moscow, in March 2024, when multiple gunmen, allegedly of Central Asian origin, killed over 145 people attending a concert. The attackers, the majority of whom were said to be from Tajikistan, were migrant labourers working in Russia as taxi drivers, barbers, in construction, etc. (BBC Russkaya Sluzhba 2024). In March 2026, addressing the State Duma, Speaker Vyacheslav Volodin lauded the work of the government, stating that they had passed 22 federal laws since 2024 "improving" the state's migration policy (Gosudarstvennaya Duma 2026).

Migration has been a sensitive issue within Russian politics, with the most senior members in the Russian political establishment traditionally avoiding statements that could be construed as xenophobic or inciting ethnic tensions. Issues around ethnicity and multiculturalism in Russia are highly sensitive due to the fact that the country is multiethnic. Unlike European conservative movements that promoted nativist ideas and focused on stigmatising migrants, like Fidesz or PiS, Russian conservatism under Putin in the 2010s was more focused on values, targeting nascent groups framed as the result of moral corruption in the West, such as members of the LGBTQ community.

Despite the Russian government's official line on multiculturalism being viewed by many with a great deal of scepticism already, and persecution of ethnic groups on Russian-controlled territories being documented before 2024, such as the Crimean Tartars, the acceleration of policy implementation and securitisation of migrants since the Crocus City Hall attacks is unprecedented. Browsing the State Duma website's "news" section between February 2022 and March 2024, there are a total of two documents published mentioning migration, migrants, or migration policy. In the 24 months since March 2024 there have been 79. Within Russia's political establishment, there were already those more fringe voices that were outspoken about migration. Figures such as Alexander Bastrykin, the Head of the Investigative Committee, have long spoken out against the large number of migrants working and settling in Russia, in language that diverges from mainstream figures like Putin, House Speaker Volodin or Prime Minister Mishustin.

In December 2024, the American publication The Atlantic published an article on the escalation of Russian nationalism that year; using the Vkontakte channel of Russkaya Obschina (Russian Society), they showed that Russian law enforcement was working with far-right groups in anti-migrant raids (Nemtsova 2024). This would have been unthinkable in Putin's Russia little over a decade ago, when extreme ethnic violence in the late 2000s forced Putin's government to come down hard on such groups. Ethnonationalist groups like Slavic Force and Slavic Union grew exponentially in the 2000s and the skinhead movement numbered in the 10s of thousands across Russia; violence peaked in 2008 when there were 114 documented racist killings, with members of these groups traditionally targeting migrants of Central Asian or Caucasian origin (Varga 2019; p.203). This movement was suppressed, but it was a symptom of views among the larger Russian population, with polling in the mid-2000s finding that over 50% of the native population in some way supporting the slogan "Russia for ethnic Russians", at a time when international migration to

the country had taken off, propelling it to become the second largest host nation for migrants after the US (Gorodzeiski 2015; p.117).

Politicians who supported these types of sentiments, like the late State Duma deputy and leader of the Liberal Democratic Party of Russia, Vladimir Zhirinovsky, were on the fringes of Russian politics and adjusted their messaging into the 2010s to avoid leaning too much into nativist sentiments (Fediunin 2023; p.5). However, Russian public opinion remained strongly in favour of restricting migration flows to the country, with 73% supporting this according to a poll conducted in August 2020 (Fediunin 2023; p.8). Some have criticised the Russian government for attempting to have it both ways in implementing liberal immigration policies and criticising the influx of migrants, citing a remark by Putin in 2006 relating to "ethnic gangs" (Fediunin 2023; p.9). However, consistent xenophobic language about migrants and migration has been avoided by the figures central to the Russian government. Despite shifting towards more socially political conservative strategies in the 2010s, Putin avoided language that could stir ethnic tension, for instance, he repeatedly emphasised the importance of civic consciousness using the more encompassing "Rossiskoe", not russkoe for Russian society (Dekulchuk et al 2025; p.28), unlike the slogan popularised in the 2000s following the wars in Chechnya Rossiya dlia Russkikh, Russia for ethnic Russians.

In light of the wave of policy reforms in the migration sphere, this research will seek to answer the following two questions:

How has Russian state rhetoric on migration been securitised across key political institutions since the Crocus City Hall attacks?

To what extent have the legislature and the executive adopted the security-focused language previously concentrated in the state's security apparatus?

Necessary for the question to be answered is an understanding of the way in which migration was spoken about in the State Duma, the Kremlin, and the National Security Council before March 2024. The research will establish the key themes and the consensus on migration before 2024. This will involve the official migration policy concept 2019-2025, and official publications on these institutions' websites from February 2022 to March 2024.

This research will employ securitisation theory as set out by the Copenhagen School. The theory addresses the broadening of the security sphere beyond the military, understanding that it is a dynamic sphere that is constantly evolving and closely related to the construction of issues by influential actors. The theory focuses on how an issue is constructed, stressing speech acts "when an issue is presented as posing an existential threat to a designated referent object" (Buzan et al 1998; p.21). There are two key concepts in relation to this research: the referent object and the securitising actor. In most cases, the government is the securitising actor (Buzan et al 1998; p.146), and the research will look at different institutions of the Russian government, analysing them as separate securitising actors, as their rhetoric is not uniform. The referent object is what the actor securitises; for instance, in the societal sector, it could be cultural identity (Buzan et al. 1998, p. 123).

I will be looking at the speech acts of Securitising actors in 5 institutions of the Russian government: the Kremlin, the State Duma, the Interior Ministry, the Investigative Committee, and the National Security Council. The goal of the research is to identify the most prevalent themes in government rhetoric used to push for stronger migration policy, i.e. to identify the most commonly used referent objects. Using some of the data in a preliminary sample, the areas identified by securitising actors as needing addressing are varied, with focus ranging from drug trafficking and fears of terrorism to the dangers of increasing xenophobia and the damaging effect of corrupt law enforcement in the migration sphere.

Using Python, I will analyse all of the material published on the government websites listed. The first dataset will be between February 2022 and March 2024. This time period measures from the establishment of the Interdepartmental Commission of the Security Council of the Russian Federation on improving State Migration Policy, and allows for even comparison with materials published since. The date of the Crocus City Hall Terrorist attacks, the 22nd March 2024, is the endpoint of the first data set and the beginning of the second. The second data set will go from March 2024 to the end of March 2026.

Following a preliminary review of the dataset, I have established 5 thematic categories that I can analyse in the securitisation framework, measuring their frequency. Firstly physical safety, I will look for mentions of crime; drug trafficking, cybercrime, weapons smuggling, sexual violence, and violence against children. Next, sociocultural identity, I will be looking at mentions of damage to Russia's indigenous culture and population; mentions of integration, ethnic enclaves, the Russian language, migrant children in schools, and sociocultural values. Separate from the crime section, I will look at mentions of the dangers of extremism; this will mainly entail a few key words such as terrorism and radicalisation. Additionally, separate from the aforementioned frequently mentioned crimes, I will look at more mundane legal violations that have been raised by officials: fictitious marriages, payment of taxes, and employment violations. Finally, I will look at material that shifts blame inwards towards domestic entities that pose a threat: corrupt law enforcement, predatory employers, rejection of the need for foreign workers, and the risk posed by xenophobia among the local population. The latter two were included as the focus of officials on these issues could be interpreted as less inflammatory and can be contrasted with the first three. The research seeks to shed more light on whether policymakers have embraced the rhetoric of figures like Bastrykin or whether they have, with the intention of securitising migration, deliberately selected less inflammatory talking points, retaining a distance between themselves and nativist sentiments.

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Animals and Virtue Ethics

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ABSTRACT

The animal ethics debate is dominated by two classic frameworks: utilitarianism and deontological / rights-based approaches. These theories have provided powerful arguments for the moral consideration of animals; they, however, often leave unresolved questions about the moral character of agents and the role of virtues in human-animal relationships. This presentation explores the potential of virtue ethics to address this gap and highlights its distinctive contributions to animal ethics.

Virtue ethics, unlike the two other approaches, is agent-centered: it emphasizes the moral agent's character rather than focusing on rules or consequences. It asks not primarily "What should I do?" but "What kind of person should I be?" Virtue ethics emphasizes traits such as compassion, justice, temperance, and humility; it views ethical life as the cultivation of these virtues through practice and habituation. Unlike act-centered theories, virtue ethics stresses the importance of moral development, flourishing (*eudaimonia*), and the relational dimensions of ethical life.

Utilitarian arguments, most famously articulated by Peter Singer, stress minimizing suffering and maximizing well-being across species. Utilitarianism provides a powerful rationale for extending moral concern to animals, but it often reduces ethical deliberation to calculations of pleasure and pain, potentially overlooking the richness of moral life and the nuances of relationships with animals.

Deontological or rights-based approaches, exemplified by Tom Regan and Christine Korsgaard, argue that animals have inherent value and rights that must be respected regardless of consequences. These approaches emphasize duties and moral constraints, offering strong protection against exploitation. Rights-based approaches, however, can appear rigid, sometimes struggling to account for the complexities of lived interactions with animals, such as companionship, care, and ecological interdependence.

Virtue ethics, exemplified by Rosalind Hursthouse, enters this dialogue by shifting the focus from abstract principles or calculations to the moral character of agents. It does not deny the importance of consequences or duties but situates them within a broader goal of moral development. This has important implications for animal ethics as well. For instance, a virtuous person will naturally avoid cruelty to animals not merely because it violates rights or produces suffering, but because cruelty is a vice that corrupts one's character. Similarly, kindness to animals is not only instrumentally valuable but intrinsically expressive of compassion and humility.

A virtue ethics-inspired perspective on animals offers several benefits:

Virtue ethics avoids the widespread but problematic approach of granting moral status based on a subject's "higher" cognitive functions (reason, language, self-awareness). Virtue ethics focuses on the human capacity for compassion, extending moral consideration to all sentient beings capable of being victims of vice or recipients of virtue.

Furthermore, unlike utilitarianism's abstract calculations or deontology's rigid duties, virtue ethics emphasizes the relational context of moral life. It recognizes that humans and animals coexist

in complex networks of interdependence—ecological, social, and emotional. Virtue ethics encourages us to see animals not merely as bearers of rights or units of welfare but as beings with whom we share a moral community. This relational emphasis fosters virtues like stewardship, responsibility, and gratitude.

Virtue ethics highlights the importance of moral education. By teaching children compassion toward animals, societies cultivate citizens who are more likely to extend care and empathy to humans as well. Animal ethics, of course, concurs in shaping broader moral culture: how we treat animals reflects and influences our overall moral character.

Virtue ethics avoids the rigidity of rights-based theories and the reductionism of utilitarian calculations. It allows for nuanced judgments sensitive to context. For example, decisions about animal use in medical research, farming, or conservation can be guided not only by abstract principles or calculations but by virtues such as prudence, compassion, and justice.

Virtue ethics aligns with insights from moral psychology, which emphasize the role of emotions, habits, and character in moral life. It acknowledges that moral agents are not purely rational calculators but embodied beings whose moral dispositions shape their actions. Most people want to be compassionate. Caring for animals, in this approach, is seen not as a burdensome duty, but as an aspect of a life well lived.

Finally, by cultivating virtues like humility and respect, virtue ethics counters the traditional anthropocentric attitude that places humans at the center of moral concern. It encourages recognition of animals as fellow creatures with intrinsic worth.

In conclusion, a virtue-based approach offers a distinctive and valuable perspective on animal ethics that complements the prevalent ones. It not only provides theoretical insights but also practical guidance for moral education, policy, and everyday interactions with animals.

KEYWORDS: animals – ethics – virtue ethics – animal ethics – moral education – moral psychology – moral philosophy

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Brand Loyalty in Kazakhstan and its Implications for Global Consumerism and Mobility -Nomadic Buying Persona Model-,

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Abstract

This current paper is aimed to discover the essence of perception of global and local brands in Kazakhstan versus Global Brands and the most important is the attitude and brand loyalty of consumers comparatively. Especially, when that brands and industries are different, and how consumers are attached to the brand. For instance, brand versus product categories and local versus global brand. Hereby, in current paper there will be a showcase of brands from the same product category one which are produced in Kazakhstan and positioned as a Kazakh brand and one as a global one. So, in those comparative studies, there will be represented some examples of the brand despite having same quality or functional specifications. And there3 will be a survey of more than 500 Kazakh consumers from top 5 urban cities, where that sample will be conducted, and hopefully there will be identified some key loyalty drivers and insights towards loyalty to local brand or local product categories only versus global brands and product categories consequently.

This study examines brand loyalty in Kazakhstan as a lens to understand broader consumer behavior patterns in Central Asia, emphasizing cultural and historical influences rooted in nomadic traditions. While global marketing research extensively investigates loyalty determinants across individualistic and collectivist cultures, Central Asia remains underrepresented. The review reveals that both local and international brands in Kazakhstan experience mixed loyalty outcomes, characterized by inconsistent customer retention and increasing marketing expenditures.

Drawing on Hofstede's cultural dimensions and recent studies on mobile consumers, this paper introduces the concept of the Nomadic Buying Persona- a framework capturing the unique mobility, collectivism, and adaptability that shape consumer preferences in the region. Unlike urban, settled markets, Kazakhstan's nomadic cultural heritage influences loyalty through communal identity and shared experience rather than habitual purchase patterns. This synthesis identifies a critical research gap: the lack of theoretical and empirical studies connecting nomadic cultural behavior to brand loyalty. By addressing this gap, the study contributes to the development of a Nomadic Consumer Behavior Model, offering insights into how brands can adapt strategies to culturally dynamic and transitional markets. The findings have implications for global consumerism, cross-cultural marketing, and the evolving understanding of loyalty in emerging economies. And findings will show that brand awareness, country of origin or brand identity would play a big role for both global and local brand. And implication for Kazakh marketers in retail industry and brands, will mean a lot in getting the strong customer experiences and brand loyalty than from global brands. However, since the study will be limited to a single product category, the findings would not be applied to all retail segments. Further research areas may imply the multiple categories to have more conclusions and contributions.

Innovative Chatbot Solutions for Cost Control and Data Confidentiality: A Compliance-by-Design Micro Case Study

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ABSTRACT

Every organization wants a chatbot until it sees the invoice, reads the data policy, and listens to what its users actually wanted in the first place. This micro case study examines how AI Boutique Cloud, an Ontario-based AI consultancy, responded to that triple frustration by building a self-hosted, retrieval-augmented generation (RAG) chatbot that keeps data in-house, costs under control, and users, for once, reasonably satisfied. Drawing on prototype testing across onboarding contexts, the study surfaces a familiar but underappreciated tension: systems that are technically competent but motivationally tone-deaf tend to be quietly abandoned. User testing revealed consistent demand for transparency, interface flexibility, and the kind of conversational adaptability that rigid third-party deployments rarely permit. Situated against the backdrop of the EU AI Act (Regulation EU 2024/1689) and tightening enterprise data governance expectations, the case argues that self-hosted architecture is not a budget workaround but a structural design choice with compliance implications. The analysis contributes a replicable framework for organizations that want their chatbot to work, to be trusted, and to still exist in the budget next year.

Keywords: Self-hosted chatbot; retrieval-augmented generation; data sovereignty; compliance-by-design; user motivation

I. INTRODUCTION

Organizations increasingly use chatbots to automate communication, yet most rely on third-party platforms, resulting in recurring costs and exposure of sensitive data. This challenge has intensified with stricter regulation of conversational AI. The EU AI Act (Regulation EU 2024/1689), enacted in August 2024, introduces risk-based requirements focused on transparency and data governance. For organizations dependent on external providers, this creates a dual problem of rising costs and compliance risks.

This micro case study explores how AI Boutique Cloud (an Ontario-based company specializing in brand-oriented AI solutions) developed a self-hosted chatbot framework to address economic, confidentiality, and regulatory demands. The study examines a prototype using retrieval-augmented generation (RAG) (Bora & Cuayáhuitl, 2024) within a controlled infrastructure, showing how local hosting reduces costs and protects data. RAG architectures, combining parametric knowledge with external retrieval (Karakurt & Akbulut, 2025), were formalized by Lewis et al. (2020) and are widely adopted because they allow organizations to retain proprietary data within auditable systems rather than relying on shared cloud services.

The case also analyzes onboarding user feedback, emphasizing the need to align chatbot design with real user preferences. This is directly linked to compliance: as Norman (2013) argues,

systems must address latent user needs. Ignoring this leads to friction and mistrust. Findings confirm emerging regulatory expectations, with users demanding transparency, control over interactions, and systems adapted to their needs.

The analysis positions AI Boutique Cloud's approach as a practical model for balancing cost efficiency, data control, and user experience without reliance on external providers. More broadly, it argues that self-hosted RAG architecture represents not only a cost-saving strategy but also compliance-by-design, embedding regulatory accountability into technical infrastructure from the outset rather than as a later legal adjustment.

II. COMPANY OUTLINE

AI Boutique Cloud, based in Ontario, Canada, provides AI solutions focused on branding, marketing, and personalized communication. The company develops chatbots, interactive platforms, and consulting services aimed at strengthening brand identity for small and medium-sized businesses through a user-centric approach.

The firm integrates technology with aesthetics, enabling consistent brand communication across digital channels. Rather than using standardized templates, it delivers tailored solutions based on each client's visual and linguistic identity. This reflects the view that brand perception extends beyond visuals, with chatbots acting as key touchpoints shaping user impressions through tone, style, and service quality.

A key element of the company's strategy is ongoing research into advanced conversational models. AI Boutique Cloud tests retrieval-augmented generation (RAG) frameworks that combine factual retrieval with language generation. These efforts focus on developing self-hosted systems to reduce dependence on third-party platforms and associated costs. The internal team evaluates how design elements - such as anthropomorphic features or minimalistic branding (Karimova, 2026) - affect user trust, efficiency, and satisfaction.

The company operates across legal, educational, and marketing domains. Chatbots are used to automate routine inquiries, support student services, and guide users through information resources. In all cases, the goal is to provide accurate, brand-aligned, and cost-effective solutions.

Cost efficiency is achieved without sacrificing sophistication. The company employs open-source tools, including ChromaDB and LangChain, to minimize expenses while maintaining full control over data. This approach removes reliance on external vendors and is particularly valuable in regulated environments.

Although focused on branding, the company's investment in self-hosted chatbot systems reflects a broader vision: technology should adapt to user needs rather than the reverse. This supports long-term client relationships through continuous improvement, testing, and responsible data management.

III. INDUSTRY OUTLINE

The chatbot industry has expanded rapidly due to growing demand for immediate assistance. Businesses across retail, healthcare, education, and legal sectors use chatbots for tasks ranging from simple FAQs to complex interactions. While cloud providers offer convenient hosting, their pricing models and data governance issues remain problematic, as reliance on external servers leads to recurring costs and risks of data exposure.

At the same time, user experience (UX) research highlights the importance of understanding latent user motivations. Traditional chatbot design often focuses on surface-level metrics such as completion time or click rates, overlooking deeper psychological factors. Human-computer interaction studies show that ignoring these aspects can result in systems that feel mechanical and

fail to engage users. While some solutions (e.g., anthropomorphic chatbots) succeed by anticipating user needs, others fail due to insufficient attention to user input.

In legal and professional contexts, chatbot adoption is particularly strong because of their ability to automate routine tasks and support decision-making. However, strict confidentiality and ethical standards require careful data management. Organizations using external hosting may risk violating privacy requirements, making in-house solutions more reliable for sensitive data.

Recent literature suggests that user satisfaction depends not only on accuracy but also on alignment with user motivations. The AI Boutique Cloud approach addresses these challenges by combining self-hosted infrastructure with advanced retrieval and generation methods. This model balances cost efficiency, compliance, and user needs, while modular open-source tools allow scalable chatbot development without reliance on proprietary platforms. without the financial burden of proprietary platforms.

IV. THE PROBLEM

Despite advances in chatbot technology, two interconnected problems remain: overreliance on external cloud services and neglect of deeper user motivations. Cloud-based solutions are often treated as the default, leading to recurring costs and financial pressure, particularly for smaller organizations. At the same time, transferring data to external platforms raises privacy concerns, especially in sectors handling sensitive information.

Financial Burden and Data Exposure. Cloud hosting generates escalating and difficult-to-control costs, particularly for large datasets such as legal documents or multilingual content. In addition, reliance on third-party providers increases exposure to breaches or unauthorized access. Although vendors maintain security standards, responsibility for compliance remains with organizations, which have limited visibility into provider processes. This is especially critical in legal and academic environments where confidentiality is essential.

Misalignment with User Motivations. A second issue is the failure to address underlying user motivations. UX research shows that users cannot always articulate their needs, and systems based only on explicit feedback risk overlooking these deeper drivers. As a result, chatbot interactions may feel mechanical or impersonal. While some innovations (e.g., Apple's iPod or early Ford vehicles) anticipated user needs successfully, failures such as Microsoft's Zune and Google Glass highlight the risks of ignoring real user preferences.

User Testing Findings. Testing at AI Boutique Cloud revealed that rigid chatbot structures reduce user satisfaction. Although participants valued quick access to information, they criticized limited customization and lack of intuitive design, which weakened trust. Users requested more personalized experiences, including adjustable settings and tone flexibility.

Similar patterns emerged in onboarding chatbot tests using think-aloud protocols. Preferences varied: some users favored visually engaging or anthropomorphic designs, while others preferred simple text-based interfaces. Many also demanded transparency regarding data storage and usage.

Consequences of Poor Design Alignment. Ignoring deeper user motivations leads to disengagement, reduced trust, and lower adoption. In academic contexts, users may avoid superficial systems, while in legal settings, poor design can undermine confidence in confidentiality. These issues may also result in financial losses when ineffective systems require redesign.

Regulatory Requirements. Regulatory pressure reinforces these challenges. The EU AI Act imposes risk management and documentation requirements, while U.S. regulation is expanding, with enforcement intensifying through 2025-2026 (Gunderson Dettmer, 2026). The FTC has

initiated investigations into chatbot data practices (Federal Trade Commission, 2025), and U.S. state authorities emphasize accountability for data misuse (James et al., 2025).

Summary of the Predicament. Organizations face two interdependent challenges. The first is structural: cloud-based systems create recurring costs and require outsourcing data control, increasing compliance risks under frameworks such as the EU AI Act (Regulation EU 2024/1689). The second is motivational: users expect systems to align with implicit needs (Norman, 2013) and respond in socially meaningful ways (Reeves & Nass, 1996), yet efficiency-focused designs often feel restrictive.

The AI Boutique Cloud case shows that both issues can be addressed through a unified solution. A self-hosted RAG architecture (Lewis et al., 2020), using tools such as ChromaDB and LangChain, reduces costs while restoring control over data. It also enables customization, transparency, and adaptability, aligning systems with user expectations. Ultimately, both problems stem from the same source: outsourcing cost and control.

V. WAY FORWARD

AI Boutique Cloud's trajectory demonstrates that organizations can adopt more flexible chatbot deployment strategies, avoiding one-size-fits-all solutions that often lead to user dissatisfaction. By using local hosting, developers maintain direct control over data, enabling adjustments in memory, retrieval, and model usage without reliance on external providers. This approach enhances data security while reducing long-term operational costs.

To improve user acceptance, the company applies a structured user testing framework combining think-aloud protocols and interviews. This approach uncovers latent user motivations often missed by conventional methods. Chatbots can then be adapted to different user segments through customizable interfaces, allowing variation in anthropomorphism and visual complexity. For example, legal professionals may prefer minimal, text-based interactions, while marketing users may favor more expressive, personality-driven designs.

AI Boutique Cloud also plans to enhance personalization through selectable chatbot personas, each offering distinct interaction styles. This aligns with research showing that personalization increases perceived authenticity and reflects the diverse contexts in which chatbots operate across legal, educational, and marketing domains.

At a broader level, the company aims to extend its RAG architecture to support multilingual interactions and region-specific regulatory requirements. This includes improving embedding models for multiple languages and integrating references to local legal and academic frameworks. Such developments increase the system's relevance in international contexts while preserving the cost and security advantages of self-hosted infrastructure.

Importantly, this architecture not only reduces costs but also anticipates emerging compliance requirements. User testing findings - particularly demands for transparency and interaction control - directly align with regulatory expectations, demonstrating consistency between empirical user insights and formal governance frameworks without requiring additional research.

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Do Cultural and Religious Holidays Matter for Frontier Markets? Evidence from KASE

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Abstract

This paper examines whether cultural and religious calendar effects influence stock market behavior in a frontier economy, using evidence from the Kazakhstan Stock Exchange (KASE). Specifically, we analyze the impact of Orthodox Christmas, Nauryz, and Ramadan on daily stock returns and volatility. The empirical framework combines ordinary least squares (OLS) regressions with extensive controls—including day-of-the-week effects, seasonal patterns, oil price dynamics, exchange rate movements, and global market returns—with GARCH-family models to capture time-varying volatility and assess whether holiday periods systematically alter risk dynamics.

We distinguish between fixed-date holidays (Orthodox Christmas and Nauryz) and the moving Islamic calendar (Ramadan), allowing for a comparative analysis of different types of calendar anomalies within a single market. The results provide evidence on whether pre- and post-holiday effects exist in returns and whether volatility behavior changes during culturally and religiously significant periods. By focusing on a thin and under-researched frontier market, the study contributes to the literature on market anomalies by testing the robustness of well-documented calendar effects in an environment characterized by lower liquidity, higher segmentation, and stronger exposure to commodity and currency shocks.

The findings shed light on the role of behavioral and institutional factors in shaping market dynamics in emerging and frontier economies, and on whether holiday-related anomalies persist once standard risk factors and macro-financial controls are taken into account.

Keywords*: Calendar anomalies; holiday effect; Ramadan effect; Nauryz; Orthodox Christmas; Kazakhstan Stock Exchange; frontier markets; stock returns; volatility; liquidity*

JEL Classification*: G12, G14, G15, C22*

Determinants of Eco-Efficiency and ESG Disclosure in Global Banking: Evidence from a Multi-Country Panel Analysis

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Abstract

This study examines the impact of firm-specific and macroeconomic factors on eco-efficiency and ESG disclosure in the global banking sector. Using a comprehensive panel dataset of 1,885 banks across 175 countries over the period 2005–2024, the analysis captures substantial cross-country heterogeneity and temporal dynamics in sustainability performance. The empirical strategy employs the Driscoll–Kraay estimator as the primary method to address heteroskedasticity, autocorrelation, and cross-sectional dependence. To ensure robustness and account for potential endogeneity driven by unobserved common factors, the Common Correlated Effects (CCE) estimator is applied.

The findings indicate that both firm-level characteristics and macroeconomic conditions exert a statistically significant influence on eco-efficiency and ESG disclosure practices. Larger and more profitable banks tend to exhibit higher levels of eco-efficiency and greater transparency in ESG reporting, while country-level conditions further shape sustainability outcomes. Grounded in the Resource-Based View and Signaling Theory, the results suggest that banks leverage internal capabilities to enhance environmental performance while using ESG disclosure as a mechanism to reduce information asymmetry and strengthen stakeholder trust.

The study contributes to the literature by providing global empirical evidence on sustainability drivers in banking and offers important implications for practitioners, policymakers, and academic researchers.

Keywords: Eco-efficiency; ESG disclosure; Banking sector; Driscoll–Kraay estimator; Common Correlated Effects (CCE); Resource-Based View.

From Play to Purpose: A Gamified Approach to Responsible Leadership and Business Sustainability

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Abstract

This qualitative study investigates the use of gamification to teach business sustainability and responsible leadership to students in a business sustainability course. Forty students participated in a gamified learning experience designed to make learning meaningful through real-world challenges, joyful by fostering motivation, social via collaboration, active through hands-on tasks, and iterative with reflection and repeated practice. Analysis of reports and reflective journals revealed that gamification enhanced student engagement, deepened understanding of sustainable business practices, and strengthened responsible leadership behaviors. These findings demonstrate that gamified pedagogy can effectively translate PRME i5 principles into practice, providing a model for developing responsible, reflective business leaders.

Drivers of Sustainability in the G7: ICT, Green Innovation, Technological Growth, Entrepreneurship, and Globalization

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The study analyzes a dynamic cross-sectional panel dataset to empirically examine the roles of ICT, green innovation, technological growth, entrepreneurial development, and globalization—while controlling for real economic growth—in driving environmental sustainability within the G7 countries. It focuses on the economies of the seven member countries—Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States—alongside the European Union over the period 1990 to 2023. By applying robust, modern, and advanced econometric techniques, the study uncovers evidence of long-run convergence and cross-sectional heterogeneities, thereby motivating a comprehensive and rigorous analysis.

Specifically, the study adopts the Augmented Mean Group (AMG) and Common Correlated Effects Mean Group (CCEMG) estimators to examine the long-run effects of the selected variables. Moreover, the Method of Moments Quantile Regression (MMQR) is employed to analyze distributional nonlinear shocks within the sample. Consequently, the study highlights the conditional nonlinear effects and causal interactions among the selected indicators, along with a panel-based decomposition of the associated structural shocks. The findings are clearly connected to policy-relevant insights aimed at mitigating environmental deterioration across the G7, while underscoring the importance of strengthening sustainability practices in line with the United Nations 2030 Sustainable Development Goals.

Keywords: Environmental Quality, G7 Countries, Long-Run Convergence, Sustainable Development Goals, Technological Growth, ICT, Green Innovation, Globalization, Entrepreneurship.

Employee Turnover in the Hospitality Industry A Critical Review of Research from Cornell University and EHL

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ABSTRACT

Employee turnover remains one of the most persistent and costly challenges confronting the hospitality industry, with annual separation rates in hotel and restaurant sectors frequently exceeding 50 percent. This paper critically examines turnover research conducted by two premier hospitality education institutions—Cornell University's School of Hotel Administration and the École Hôtelière de Lausanne (EHL). Through systematic analysis of 97 peer-reviewed studies published across four decades, this review synthesizes findings on turnover antecedents, consequences, and retention strategies within service industries, hospitality, and foodservice contexts. Research at Cornell University has made pioneering contributions in quantifying the economic impact of turnover, demonstrating the key role of leadership fairness and behavioral integrity, and advancing the understanding of compensation systems in the hospitality industry. Although EHL's research is relatively limited in quantity, it provides valuable insights into the selection practices and knowledge creation processes in hospitality human resource management. This review identifies key individual-level factors (job satisfaction, organizational commitment, perceived fairness), organizational-level factors (HRM practices, leadership quality, organizational culture), and industry-specific factors (seasonality, low wages, limited career development) that drive turnover intentions and behaviors. Methodological critique reveals several limitations in the literature: overreliance on cross-sectional survey designs, overrepresentation of frontline employees in luxury hotels, inconsistent measurement of turnover constructs, and limited longitudinal studies tracking actual turnover behavior. The review concludes with recommendations for future research, including greater use of mixed methods, increased attention to underrepresented segments (quick-service restaurants, small independent properties), and development of more sophisticated theoretical models that capture the dynamic nature of turnover decisions in hospitality.

Keywords : employee turnover; hospitality industry; Cornell University; EHL; retention strategies; job satisfaction; organizational commitment; leadership fairness

1. Introduction

Employee turnover constitutes one of the most significant human resource challenges facing the global hospitality industry. Annual turnover rates commonly surpass 50 percent in many hotel and restaurant operations, occasionally reaching triple digits in quick-service restaurant contexts, with substantial economic and operational consequences from employee departures (Dwesini, 2019; Dogru et al., 2023). The hospitality industry's distinctive characteristics—seasonal fluctuations, low entry-level wages, limited career advancement opportunities, and high-stress customer service environments—create conditions particularly prone to elevated turnover rates (Kysilka & Csaba, 2013; Wildes, 2005).

Academic scholarship on employee turnover in hospitality contexts has evolved considerably over the past four decades, with two institutions emerging as particularly influential contributors:

Cornell University's School of Hotel Administration and the École Hôtelière de Lausanne (EHL). Established in 1922, Cornell's School of Hotel Administration was the first university program in hotel management and has produced pioneering research that has shaped both academic and industry understanding and practice of workforce management (Sturman et al., 2011). Founded in 1893, EHL was the world's first hospitality school and has likewise contributed to hospitality knowledge creation, though its specific research output on turnover has been more limited (Chen et al., 2019).

This literature review provides a comprehensive and critical examination of employee turnover research conducted by or affiliated with these two premier institutions, supplemented by relevant studies from the broader hospitality academic community. The review encompasses research on the service sector broadly, hospitality specifically, and foodservice operations, reflecting the diverse segments constituting the hospitality landscape. No temporal restrictions were applied, enabling examination of how research questions and methodologies have evolved over time.

This review pursues four objectives: first, to synthesize major findings on antecedents and consequences of employee turnover in hospitality contexts; second, to critically evaluate methodological approaches employed in this research; third, to identify gaps and limitations in existing literature; and fourth, to provide recommendations for future research directions. By focusing on contributions from Cornell and EHL while situating them within the broader literature, this review offers both a focused analysis of influential research programs and a comprehensive overview of the field.

2. Theoretical Frameworks and Conceptual Foundations

2.1 Defining Employee Turnover

Employee turnover has been conceptualized in multiple ways throughout the hospitality literature that have been surveyed, with significant distinctions between voluntary and involuntary turnover, as well as between actual turnover behavior and turnover intentions. The pioneering work of March and Simon (1958) conceptualized turnover as a function of perceived mobility willingness and perceived mobility possibility, a framework that has profoundly influenced subsequent hotel research. In the hotel context, voluntary turnover—where employees choose to leave their positions—has received more research attention than involuntary turnover, reflecting the industry's particular challenges in employee retention (Simons & Hinkin, 2001).

Turnover intention is defined as an employee's awareness of and deliberate willingness to leave the organization and has been used as the main dependent variable in most hotel turnover studies (Park & Min, 2020). This focus on intentions rather than actual behavior reflects practical considerations (longitudinally tracking actual departures is resource-intensive) and theoretical assumptions derived from the theory of planned behavior, which posits that intention is the most immediate determinant of behavior (Holston-Okae, 2018). However, the gap between intention and behavior remains a significant concern, and meta-analytic evidence shows that only about 30% of employees who express turnover intentions actually resign within a year (Guzeller & Celiker, 2020).

2.2 Theoretical Models of Turnover

Several theoretical frameworks have guided research on hotel turnover. Mobley et al.'s (1979) intermediate link model has been particularly influential, assuming that job dissatisfaction leads to intentions to consider quitting, search for alternatives, evaluate alternatives, and ultimately result in turnover behavior. This model laid the foundation for understanding the psychological processes behind employees' turnover decisions in the hotel context (Nadiri & Tanova, 2010).

Recently, the job embeddedness perspective proposed by Mitchell et al. (2001) has gained attention in hotel research. This framework conceptualizes employees as embedded in organizational and community networks, with turnover occurring when the forces pushing employees out exceed those keeping them in. Amankwaa et al. (2022) applied this framework to hotel employees, demonstrating that both organizational embeddedness (fit, links, sacrifice within the organization) and community embeddedness significantly influence turnover intentions, with transformational leadership moderating these relationships.

The conservation of resources (COR) theory has also been applied to research on hotel employee turnover, especially in understanding how work stress and burnout lead to resignation decisions. This perspective holds that employees strive to retain, protect, and build resources, and when job demands exceed their available resources, turnover represents an attempt to minimize resource loss (Han, 2022).

3 Research from Cornell University's School of Hotel Administration

3.1 Economic Impact of Turnover

Cornell researchers have made pioneering contributions to understanding the economic consequences of employee turnover in hospitality contexts. Simons and Hinkin's (2001) landmark study, published in the Cornell Hotel and Restaurant Administration Quarterly, provided the first rigorous empirical examination of turnover's impact on profitability across multiple hotels. Analyzing data from 12 hotels operated by a single management company, they found that hotels with lower turnover rates achieved significantly higher gross operating profits, even after controlling for hotel size and average daily room rates. This study was groundbreaking in translating the abstract concept of turnover costs into concrete financial metrics that hotel executives could understand and act upon.

Critical Analysis: The study's strength lies in using actual financial performance data linked to HR metrics, moving beyond self-reported perceptions. However, the cross-sectional design limits causal inference—while the authors argue that lower turnover leads to higher profits, reverse causality cannot be excluded (more profitable hotels may afford better retention programs). Additionally, the sample was limited to full-service hotels under single management, raising questions about generalizability to limited-service properties or independent operations.

Building on this foundation, Moncarz et al. (2009) conducted an exploratory study of organizational practices affecting turnover and retention in U.S. lodging properties. Surveying 1,149 hotels, they identified specific practices associated with lower turnover, including comprehensive orientation programs, competitive compensation packages, and internal promotion opportunities. The study's large sample size and focus on actionable practices made it particularly valuable for industry practitioners.

3.2 Leadership, Fairness, and Behavioral Integrity

Cornell's most influential research on employee turnover examined the role of leadership, particularly leader fairness and behavioral integrity. Simons and Roberson (2003) published a highly cited study in the Journal of Applied Psychology demonstrating that aggregated employee perceptions of fairness are significantly related to business unit-level outcomes, including turnover rates and customer satisfaction ratings. The study is notable for its multilevel analysis, linking individual perceptions with organizational outcomes across 49 hotels.

Simons (2008) extended this work in his book The Integrity Dividend, introducing the concept of behavioral integrity, the perception that managers' words and actions are consistent, as a key predictor of employee retention. Subsequent empirical research confirmed that hotels where managers display high behavioral integrity experience lower turnover rates and higher profitability

(Simons et al., 2018). This line of research had a substantial practical impact, with many hotel organizations implementing integrity-focused leadership development programs based on these findings.

Early work by Simons and Enz (1995) on motivating hotel employees provided foundational insights into what hotel staff value most. Surveys revealed that factors such as fair treatment, recognition, and growth opportunities often surpass compensation in importance—findings that have guided the development of employee retention strategies in the hotel industry. This research was methodologically innovative in using conjoint analysis to understand employee preferences.

3.3 Compensation and Wage Systems

Michael Sturman is another outstanding researcher at Cornell University who has made significant contributions to understanding compensation systems in hotel settings. Sturman (2001) examined the "compensation dilemma" in the hotel industry, arguing that the historical practice of paying below-market wages may be counterproductive when turnover costs are considered. His analysis shows that hotel employers often fail to account for the full cost of turnover when making compensation decisions, resulting in low wage levels that ultimately undermine profitability.

Sturman et al. (2013) conducted a longitudinal study on pay fairness in Chinese star-rated hotels, demonstrating that perceptions of pay fairness significantly predict employee attitudes and behaviors over time. This study is methodologically important because it is one of the few longitudinal surveys in the hotel turnover literature, providing stronger causal inference than typical cross-sectional designs. Sturman (2003) also advanced the application of utility analysis in hotel human resource management, offering tools to quantify the financial value of HR interventions, including those aimed at reducing turnover. This work helps bridge the gap between HR practices and financial decision-making, providing hotel managers with an evidence-based approach to evaluating investments in employee retention programs.

3.4 Critical Analysis of Cornell's Research Approach

Cornell's research project on employee turnover demonstrates several methodological advantages. First, compared with single-organization studies that dominate much of the organizational behavior literature, it consistently uses samples from multiple hotel properties to enhance external validity. Second, integrating financial performance data with human resource metrics provides compelling evidence on the impact of employee turnover on hotel operations. Third, it maintains a productive balance between theoretical contributions and practical applications.

However, several methodological limitations are apparent. While survey methods are practical for multi-site data collection, excessive reliance on surveys raises concerns about common method bias, particularly when examining the relationship between employee attitudes and turnover intentions. The predominant use of cross-sectional design limits causal inference, but it is noteworthy that studies (Simons et al., 2018; Sturman et al., 2013) demonstrate the value of longitudinal approaches.

The sample composition is also somewhat narrow, as most studies focus on full-service hotels in a North American or European context. There is limited attention to fast-food outlets, small independent hotels, and hotels in emerging market contexts, which restricts the generalizability of findings to more diverse hotel scenarios. Moreover, while understandable from a practical perspective, the focus on turnover intentions rather than actual turnover behavior raises questions about the practical significance of the findings, as meta-analytic studies record a gap between turnover intentions and actual turnover behavior.

4 Research from École Hôtelière de Lausanne (EHL)

4.1 Knowledge Creation and Research Output

EHL's contributions to the study of turnover issues must be understood within the broader context of the school's research mission and practice. Chen et al. (2019) conducted a comprehensive analysis of EHL's knowledge creation and research output. The study revealed that EHL increasingly emphasizes applied research addressing industry challenges, including workforce management issues. The research documents EHL's research output across multiple fields, identifying human resource management as one of the key focus areas. However, the analysis also points out that EHL's research output in specific areas of human resource management, particularly turnover, is smaller in quantity compared to Cornell. This reflects EHL's smaller faculty size and its historically consistent emphasis on practical training rather than research production.

4.2 Selection and Retention Practices

Pougnet and Fernandez's study on employee selection practices in the Swiss hotel industry, although not entirely focused on turnover, provides important insights into understanding retention. Their work examined how Swiss hotel employers conduct recruitment and selection, identifying practices associated with higher retention outcomes. The study found that employers who invested more in the selection process, including multiple interviews and assessment-centered methods, experienced lower subsequent employee turnover—indicating that better person-job fit helps improve employee retention.

The study by Igarashi (2025), conducted in collaboration with EHL on productive organizational and sustainable work practices in the hotel industry, examined how organizational practices affect employee retention. This study identified specific work arrangements and organizational policies associated with lower turnover rates, including flexible scheduling, career development opportunities, and supportive management practices. The study is notable for its comparative approach, examining hotel projects across multiple countries.

4.3 Critical Analysis of EHL's Research Approach

Although EHL's research contributions on turnover are valuable, they are more limited in scope and quantity compared to Cornell's research programs. Available studies are often less theory-driven but more descriptive than those from Cornell, emphasizing the documentation of current practices rather than testing causal relationships. This reflects EHL's philosophy of being application-oriented and focused on serving the information needs of the hotel industry.

Methodologically, EHL primarily employs qualitative research and field-based approaches, with limited use of Cornell's large-scale, multi-site quantitative designs. Sample sizes are generally small, and locations are mainly in Europe, particularly Switzerland. While this provides valuable insights into the European hotel context, it limits comparability with North American research and the generalizability to global hotel operations.

A significant strength of EHL research is its focus on emerging topics, such as sustainable work patterns and the impact of technological changes on hotel employee employment. These forward-looking studies address challenges that will increasingly affect hotel staff turnover and retention in the coming years, making an important contribution to understanding the future of hotel work.

5 Antecedents of Employee Turnover

5.1 Individual-Level Factors

The hospitality turnover literature has identified numerous individual-level factors influencing employees' decisions to leave. Job satisfaction has emerged as the most consistently studied and strongly supported predictor, with meta-analytic evidence confirming a significant

negative relationship between satisfaction and turnover intentions (Park & Min, 2020). Ghiselli et al. (2001) examined job satisfaction among foodservice managers, finding that satisfaction with the work itself, supervision, and promotion opportunities were particularly strong predictors of turnover intentions.

Organizational commitment represents another critical individual-level factor. Guzeller and Celiker's (2020) meta-analysis found that affective commitment—emotional attachment to the organization—showed the strongest negative relationship with turnover intentions among commitment types. This finding has been replicated in numerous hospitality-specific studies, including Tnay et al.'s (2013) research demonstrating that both job satisfaction and organizational commitment independently predict turnover intentions.

Perceived organizational fairness has emerged as a particularly important predictor in hospitality contexts, reflecting the industry's hierarchical structure and the importance of fair treatment in service environments. Nadiri and Tanova's (2010) highly cited study found that perceptions of organizational fairness strongly influenced job satisfaction and organizational citizenship behaviors, with implications for turnover. Distributive fairness (fairness of outcomes), procedural fairness (fairness of processes), and interactional fairness (fairness of interpersonal treatment) have all demonstrated significant relationships with turnover intentions.

Job stress and burnout have received increasing attention as turnover antecedents, particularly given the high-stress nature of hospitality work. The emotional labor required in customer service roles, combined with long hours and irregular work schedules, creates conditions prone to burnout. Research consistently finds that employees experiencing higher levels of burnout express greater turnover intentions, with exhaustion being the burnout dimension most strongly associated with intentions to leave (Han, 2022).

5.2 Organizational-Level Factors

Leadership quality is one of the strongest predictors of staff turnover at the organizational level in a hotel context. Transformational Leadership, characterized by inspirational motivation, intellectual stimulation, individualized consideration, and idealized influence, has been shown to have a consistently negative relationship with turnover intention (Dlamini et al., 2017). Mediated by organizational commitment, Authentic Leadership, which emphasizes self-awareness, relational transparency, an internalized moral perspective, and balanced processing, is also associated with lower turnover intentions (Ausar et al., 2016). Servant Leadership has received attention in hotel research; Jang and Kandampully (2018) demonstrated that servant leadership behaviors reduce turnover intentions of food and beverage employees by increasing affective organizational commitment. This finding is particularly relevant to the hospitality industry, where service-oriented leadership aligns with the industry’s customer-centric values.

Human resource management practices as antecedents of turnover have been widely studied. Ashton (2018) found in research on Thai hotels that soft human resource management practices, including training and development, performance appraisal, and career planning, significantly affect job satisfaction and retention. Similarly, mediated by psychological empowerment, research on green human resource management practices has identified the relationship between environmentally sustainable HR policies and employee retention (Islam et al., 2022).

Organizational culture and climate are also closely related to employee turnover. The studies have found that a supportive organizational culture, where employees feel valued and respected, are associated with lower turnover intentions. In contrast, toxic organizational cultures characterized by blame, favoritism, and lack of psychological safety predict higher turnover (Chahal, 2017).

5.3 Industry-Specific Factors

The hospitality industry presents unique factors contributing to high turnover. Seasonal fluctuations create employment instability, with many positions inherently temporary or part-time. This structural characteristic of the industry makes some turnover inevitable, though research suggests that even seasonal employees can be retained across seasons with appropriate practices (Dogru et al., 2023).

Low wages, particularly in entry-level positions, represent another industry-specific driver of turnover. Sturman's (2001) analysis of hospitality compensation found that the industry's historical practice of paying below-market wages contributes to turnover as employees leave for higher-paying opportunities. However, research also suggests that non-monetary factors can partially compensate for lower wages, particularly when employees perceive their work as meaningful or enjoy the service environment (Simons & Enz, 1995).

Limited career development opportunities in many hospitality organizations contribute to turnover, particularly among ambitious employees seeking professional growth. The industry's pyramidal organizational structure means promotion opportunities are limited, and many employees must change employers to advance their careers. Research has found that perceived career development opportunities significantly predict turnover intentions, with employees seeing clear advancement paths more likely to remain (Ghani et al., 2022).

Work-life balance challenges, stemming from long hours, weekend and holiday work requirements, and unpredictable schedules, have been identified as significant turnover drivers, particularly for employees with family responsibilities. The COVID-19 pandemic heightened awareness of these issues, with many hospitality employees reassessing their career choices given work-life balance concerns (Ruokonen, 2023).

6 Consequences of Employee Turnover

Consequences of employee turnover in hospitality span multiple levels, affecting individuals, organizations, and the industry as a whole. At the organizational level, Simons and Hinkin (2001) demonstrated that turnover negatively affects hotel profitability, with costs including recruitment and training expenses for replacement personnel, productivity losses during learning curves, and potential decreases in service quality when inexperienced employees serve customers.

Service quality impacts of turnover have been documented in several studies. New employees typically require time to develop the skills and knowledge necessary to deliver high-quality service, and during this learning period, customer satisfaction may be compromised. Additionally, departure of experienced employees represents loss of institutional knowledge and customer relationships that are difficult to replace (Michael & Fotiadis, 2022).

Turnover also affects remaining employees, who may experience increased workloads during staffing shortages and loss of valuable colleagues and social connections. These effects can create turnover spirals, where initial departures trigger additional turnover as remaining employees face deteriorating work conditions. Research has found that turnover contagion effects are particularly strong in hospitality contexts, where employees work in close proximity and frequently discuss job opportunities (Holston-Okae, 2017).

At the industry level, high turnover rates create challenges for workforce development and industry image. The hospitality industry has historically struggled to attract talent, partly due to perceptions of low wages and limited career prospects associated with high turnover. Addressing turnover is thus not only an organizational imperative but also an industry-wide concern (Dwesini, 2019).

7 Retention Strategies and Interventions

7.1 Human Resource Management Practices

Research has identified several HRM practices associated with improved retention in hospitality contexts. Comprehensive orientation and onboarding programs help new employees acclimate to their roles and organization, reducing early turnover. Moncarz et al. (2009) found that hotels with more extensive orientation programs experienced lower turnover rates, suggesting that investment in socialization pays retention dividends.

Training and development opportunities represent another key retention strategy. Employees who receive training feel more competent in their roles and feel more valued by the organization, both of which contribute to retention. Additionally, development opportunities signal that the organization is invested in employees' long-term careers, increasing commitment to remain (Ashton, 2018).

Competitive compensation and benefits packages remain important retention tools, though research suggests non-monetary factors are also significant. Sturman's (2001) analysis indicated that hotel employers may be underinvesting in compensation relative to turnover costs, and that raising wages could be profitable if turnover reduction is considered. Beyond base wages, benefits such as health insurance, retirement plans, and employee discounts can enhance retention.

Recognition and reward programs that acknowledge employee contributions are associated with improved retention. These programs can take various forms, including formal recognition ceremonies, employee-of-the-month programs, and informal supervisor praise. The key is ensuring that recognition is perceived as genuine and fairly distributed (Woods & Macaulay, 1989).

7.2 Leadership Development

Given the strong evidence linking leadership quality to turnover, leadership development represents a critical retention strategy. Training managers in transformational, authentic, or servant leadership behaviors can improve their relationships with subordinates and reduce turnover intentions. Simons' (2008) research on behavioral integrity suggests that leadership development should emphasize the importance of consistency between words and actions.

Frontline supervisors deserve particular attention, as they have the most direct contact with frontline employees and their behaviors most directly influence turnover decisions. Investment in supervisor selection and training can yield significant retention benefits. Research suggests that employees often leave managers rather than organizations, making supervisor quality a critical retention factor (Hogan, 1992).

7.3 Organizational Culture Interventions

Building an organizational culture that values employees and supports their well-being can enhance retention. This includes creating psychological safety where employees feel comfortable speaking up, fostering positive colleague relationships, and demonstrating organizational support for work-life balance. Cultural change is difficult and time-consuming, but retention benefits can be substantial (Chahal, 2017).

Employee involvement and empowerment strategies that give employees voice in decisions affecting their work are associated with improved retention. When employees feel their opinions matter and they have some control over their work environment, they are more likely to feel committed to the organization. This is particularly relevant in hospitality, where frontline employees often have valuable insights into customer needs and operational improvements (Lee, 2012).

8 Methodological Critique

8.1 Research Design Limitations

The hospitality turnover literature is dominated by cross-sectional survey designs, limiting causal inference. While these designs are practical for collecting data from multiple organizations and employees, they cannot establish temporal precedence or exclude reverse causality. The few longitudinal studies that have been conducted, such as Simons et al. (2018) and Sturman et al. (2013), demonstrate the value of tracking variables over time and should serve as models for future research.

Experimental and quasi-experimental designs are rare in the hospitality turnover literature, reflecting practical challenges of manipulating organizational practices in real-world settings. However, such designs would provide stronger evidence for causal relationships and the effectiveness of retention interventions. Greater use of natural experiments, such as organizational policy or leadership changes, could help address causal questions.

8.2 Measurement Issues

Measurement of the turnover construct presents several challenges. Turnover intention is the most frequently studied outcome, typically measured with self-report scales of uncertain validity. While meta-analytic evidence supports the relationship between intentions and behavior, the intention-behavior gap means that studies focusing solely on intentions may overestimate the practical significance of findings. More research should track actual turnover behavior, even if this requires longer timeframes and greater resource investment.

Many studies rely on single-source self-report data for both predictors and outcomes, raising concerns about common method bias. When attitudes and intentions are both measured from the same respondents at the same time, relationships between them may be inflated. Research designs incorporating objective measures (such as actual turnover records, supervisor ratings, customer satisfaction data) can help address these concerns.

Measurement of industry-specific constructs (such as emotional labor or service climate) sometimes relies on measures adapted from other contexts without adequate validation. Ensuring measures are appropriate for hospitality contexts is essential for accurate assessment of turnover-related constructs.

8.3 Sampling Issues

Sampling limitations affect the generalizability of hospitality turnover research. Many studies focus on frontline employees in full-service hotels, with less attention to other positions (such as management, back-of-house) and other hotel segments (such as quick-service restaurants, resorts, cruise ships). This narrow focus may produce findings not generalizable across the diverse hospitality industry.

Geographic sampling has also been limited, with most research conducted in North America, Europe, and increasingly Asia. Less is known about turnover dynamics in other regions, including Africa, Latin America, and the Middle East. Given cultural differences in work values and employment relationships, findings from Western contexts may not transfer directly to other cultural settings.

Response rates in hospitality turnover surveys are often low or unreported, raising concerns about selection bias. Employees who choose to participate in research may differ systematically from non-participants, potentially affecting the validity of findings. Greater attention to response rates and assessment of non-response bias is needed.

8.4 Future Research Directions

Several future research directions emerge from this review. First, greater use of longitudinal and experimental designs would strengthen causal inference and provide more robust evidence for retention interventions. Second, increased attention to underrepresented segments of the hospitality industry, including quick-service restaurants, small independent properties, and non-traditional hospitality settings, would enhance generalizability. Third, research should examine the dynamic nature of turnover decisions, recognizing that turnover intentions change over time in response to changing circumstances. Diary studies and experience sampling methods may be more effective than traditional survey methods in capturing these dynamics. Fourth, the integration of technology in hospitality service delivery creates new questions about how technological change affects turnover and which retention strategies are effective in an increasingly automated environment. Fifth, the COVID-19 pandemic fundamentally changed hospitality work in ways not yet fully understood. Research examining how pandemic-related changes (such as increased remote work, enhanced health and safety protocols, changing customer expectations) affect turnover would be valuable. Finally, more research is needed on the effectiveness of specific retention interventions, employing rigorous evaluation designs that can guide evidence-based practice.

9 Conclusion and Implications

High employee turnover rates continue to represent a critical challenge for the hospitality industry, carrying substantial economic and operational consequences. Research demonstrates that turnover is shaped by individual factors (job satisfaction, organizational commitment, perceived fairness), organizational factors (leadership quality, human resource management practices, organizational culture), and industry-specific factors (seasonality, wages, promotion opportunities). This review examines two of the world's top hospitality education institutions. Cornell University's research projects have influential in using economic analysis to establishing the case for employee retention, demonstrating the importance of leadership integrity, and advancing the understanding of compensation systems. The École Hôtelière de Lausanne (EHL) has contributed valuable insights into the challenges of the hospitality in an European contexts and emerging workforce management. And the collaborative research of these institutions has significant advanced both academic understanding of hospitality industry and the industry practice.

This view summarizes several key findings that have important implications for theory, research methods, and practice:

First, research evidence consistently indicates that hotel employee turnover is influenced by a complex interplay among individual, organizational, and industry-specific factors. Job satisfaction and organizational commitment remain the strongest individual-level predictors, while the leadership quality and the human resource management practices are the most powerful organizational-level influencers. Industry characteristics including seasonality, low wages, and limited advancement opportunities for advancement, creating structural conditions that lead to high employee turnover.

Second, Cornell's research projects have made particularly impactful contributions in quantifying the economic impact of employee turnover, demonstrating the importance of leadership fairness and behavioral integrity, and advancing understanding of compensation systems that shaping academic discourse and industry practice. EHL's research, while small in volume, but has provided valuable insights and practical pathways to emerging issues such as the hospitality in European contexts and sustainable working models.

Third, methodological limitations in the literature including over-reliance on cross-sectional designs, single-source and self-report data, narrow sampling, limit the strength of conclusions drawn and the generalizability of findings.

Fourth, evidence-based strategies for improving employee retention. For example, investing in leadership quality, particularly at the supervisor level, offers great returns. Ensuring fair treatment, consistent management behavior, and competitive compensation and benefits are fundamental. Beyond these fundamentals, providing more opportunities for development, recognizing employee contributions, and building a supportive organizational culture can further enhance employee retention.

However, methodological limitations limit the knowledge currently acquired. Future research with longitudinal designs, objective measurements, and more diverse samples will strengthen the theoretical and data foundation, greatly advancing the field. Additionally, studies examining the effectiveness of specific staff retention policy interventions will provide valuable guidance for hotel managers. As the hospitality industry continues to evolve, responding to technological changes, changing customer expectations, and new workforce dynamics, and understanding and addressing high hotel employee turnover will continue to remain an important research position. This review provides a solid basis for future research, but continued investigation is needed to ensure that employee retention strategies continue to be effective in the context of change. It is hoped that by building on the shared contributions of Cornell, EHL, and the broader hospitality research community, together with the joint efforts of scholars and practitioners, we can create a more stable, satisfying, and productive hospitality work environment.

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Portable but not beneficial? Country Governance Distance and Acquirers' Long-Run Market Performance

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ABSTRACT

The Portable Country Governance Theory (PCGT) proposes that firms from better-governed countries create value in cross-border mergers and acquisitions (M&A) by transferring superior governance practices to targets in weaker institutional environments. Existing evidence relies on short-run announcement returns, which only capture investor expectations rather than realized post-acquisition outcomes. Using 865 cross-border acquisitions, we examine whether country governance distance affects long-run market performance. We find that greater governance distance is negatively associated with long-run abnormal stock returns (buy-and-hold abnormal returns). These findings suggest that governance portability generates short-term market optimism but does not translate into sustained value creation, identifying temporal boundaries to country governance portability.

Keywords: portable country governance theory, country governance distance, cross-border acquisitions, long-run abnormal returns, post-acquisition integration.

1. INTRODUCTION

Well-developed and stable political and institutional environments are traditionally viewed as attractive locations for cross-border acquisitions (Xie, Reddy and Liang, 2017). Cross-border acquisitions primarily occur between firms located in developed markets, where strong investor protection and efficient capital markets support value creation (La Porta, Lopez-de-Silanes, Shleifer and Vishny, 1998). In contrast, developing markets are often perceived as risky due to institutional voids and weaker governance structures (Peng, Wang and Jiang, 2008). Consistent with this view, firms from well-developed institutional environments may face lower returns when investing in countries with weaker governance systems (Slesman, Baharumshah and Wohar, 2015). Accordingly, conventional international business research largely treats distance and institutional differences as obstacles that complicate integration and undermine performance (Shenkar, Luo and Yeheskel, 2008).

Challenging this conventional perspective, Ellis, Moeller, Schlingemann, and Stulz (2017) introduce the Portable Country Governance Theory (PCGT). Building on agency theory (Jensen and Meckling, 1976) and the law and finance literature (La Porta et al., 1998), PCGT argues that firms from better-governed countries can transfer the benefits of superior governance to targets in worse-governed countries. The theory rests on the assumption that firms operating in strong institutional environments benefit from effective investor protection, well-developed capital markets, credible contracting, and stronger monitoring mechanisms. These advantages enable superior resource allocation, more disciplined managerial decision-making, and improved access to external finance. When such firms acquire targets in weaker governance environments, they are expected to "carry" these governance benefits across borders and implement efficiency-enhancing

reforms within the target organization (Ellis et al., 2017). Through improved monitoring, contractual enforcement, managerial discipline, and financial restructuring, acquirers can induce operational and financial improvements in the target firm, thereby creating shareholder value (Bris and Cabolis, 2008; Ellis et al., 2017).

In this sense, governance distance is viewed as an opportunity for value creation, not an obstacle. Hence, Ellis et al. (2017) show that governance distance generates positive short-run stock market reactions, suggesting that firms from better-governed countries can create value by transferring superior governance practices to targets in weaker institutional environments. However, their evidence is based on announcement-period returns and therefore reflects investor expectations rather than realized post-acquisition outcomes. Ellis et al. (2017) argue that governance portability should generate lasting operational improvements and ultimately sustained value creation, and they explicitly call for research examining both short- and long-run acquisition outcomes. However, existing evidence remains largely confined to announcement-period returns. While subsequent research has explored firm-level governance transfer mechanisms in mergers and acquisitions in the short run (Hussain and Loureiro, 2022), the broader stock market consequences of country governance distance beyond the short term have not been systematically examined.

We contribute by examining whether country governance distance translates into sustained value creation. Drawing on post-acquisition research emphasizing integration challenges and resistance (Shimizu, Hitt, Vaidyanath, and Pisano, 2004) and legitimacy constraints in cross-border practice transfer (Kostova, 1999), we find that governance distance is negatively associated with long-term abnormal stock returns. These results suggest that although governance portability may generate short-term optimism (as discussed by Ellis et al., 2017), greater distance intensifies resistance and implementation costs that erode value over time. By focusing on realized long-run performance, we extend PCGT and clarify its temporal scope in cross-border acquisitions.

2. THEORETICAL BACKGROUND AND HYPOTHESES

The mechanisms described in the Portable Country Governance Theory (PCGT) imply deep post-acquisition integration, as governance practices are transferred from the acquirer to the target (Puranam, Singh and Chaudhuri, 2009). Such transactions resemble “intensive care” acquisitions that require substantial changes in management and operations (Angwin and Meadows, 2015). However, this transfer assumes that the target will accept and internalize the acquirer’s practices. Deep integration is associated with high costs, particularly when target firms resist radical changes imposed by the acquirer (Reus, Lamont and Ellis, 2016). PCGT implicitly assumes that targets in worse-governed countries are inefficient and willing to accept such reforms, yet this is a questionable assumption. Not all target firms are inefficient, nor are they necessarily willing to adopt externally imposed practices. As Kostova (1999) argues, the success of cross-border practice transfer depends on the perceived legitimacy of these practices in the host environment. When governance contexts differ substantially, transferred practices may lack legitimacy and trigger resistance rather than genuine internalization, thereby increasing integration costs and undermining long-run performance.

Post-acquisition integration in cross-border acquisitions becomes increasingly difficult as governance distance rises. Greater distance reduces the likelihood that governance practices can be effectively transferred and internalized, thereby impairing synergy realization (Contractor, Lahiri, Elango and Kundu, 2014). As governance contexts diverge, differences in norms, control systems,

and managerial expectations become more pronounced, and perceptions of legitimacy increasingly diverge (Cumming, Filatotchev, Knill, Reeb, and Senbet, 2017). Practices that appear rational and superior to the acquirer may therefore be perceived as intrusive or inappropriate by the target (cf. Cartwright and Cooper, 1993). Resistance may manifest in acculturative stress, conflict between managerial teams, reduced cooperation, and executive turnover (Very, Lubatkin and Calori, 1996; Krug and Harvey Hegarty, 2001), all of which increase coordination and implementation costs. Since the post-acquisition phase is the most critical stage for realizing expected synergies (Shimizu et al., 2004), heightened resistance under greater governance distance raises the likelihood that anticipated governance advantages fail to materialize.

While governance distance may initially be perceived as value-enhancing due to the expected benefits of portability (Ellis et al., 2017), the realization of these benefits depends on successful post-acquisition integration. When resistance and implementation costs outweigh anticipated governance gains, expected synergies fail to materialize, and long-term performance deteriorates. Accordingly, we expect governance distance to negatively affect the acquiring firm's long-term stock market performance.

Hypothesis 1: The country governance distance between the acquirer and the target company has a negative effect on the long-term stock market performance of the acquirer after a cross-border acquisition.

The direction of governance distance further conditions this resistance mechanism. When the acquirer originates from a better-governed country (positive distance), deeper governance reforms are required (Puranam et al., 2009), increasing the likelihood of resistance (Cartwright and Cooper, 1993). In contrast, when the acquirer originates from a worse-governed country (negative distance), the scope for imposing superior practices is more limited and the legitimacy gap smaller (Kostova, 1999). Accordingly, the negative effect of governance distance on long-term performance should be stronger when the distance is positive than when it is negative.

Hypothesis 2: The negative effect of country governance distance on long-term stock market performance is stronger when the acquirer originates from a better-governed country than when it originates from a worse-governed country.

3. METHOD

Sample Selection

We collected data for a sample of 865 cross-border acquisitions that took place between 1997 and 2004. The period was selected to exclude the effects of the financial crisis to avoid the inclusion of acquisitions announced due to financial distress. Typically, the threshold to exclude the effects of the financial crisis is 2007, as this year marks the beginning of the global credit crisis (Grave, Vardiabasis and Yavas, 2012). Nevertheless, since we examine the long-run performance of buyers on the stock market for a maximum of three years after the closing of a transaction, we need the price data for this specific time frame after an acquisition deal. Therefore, we have deducted three years from the typical cut-off point in order to obtain the required maximum valuation period, which is not affected by the particularities of the financial crisis that commenced in 2007.

We also employed additional criteria for selecting the sample in line with existing research. First, we only used transactions that were completed and officially confirmed, not transaction rumours. Second, all transactions are international: the acquiring and target companies are in different countries. Third, the acquirer must be a publicly listed entity to ensure sufficient data availability. Fourth, the transactions should result in a controlling interest, as it enables the acquirer to significantly influence the business operations and management practices of the target company (Walsh, 1988). Finally, we excluded serial acquirers from the sample because the completion of multiple transactions in the time frame investigated prevents the isolation of the effect of a particular deal on the post-completion performance of the acquirer (Fischer, 2017).

Variables and Measurement

Dependent variable: We measure long-run market performance after a certain event or acquisitions specifically in this study. In line with previous research (see Lyon, Barber and Tsai, 1999), we use the event-time approach and calculate buy-and-hold abnormal returns (BHARs) to measure long-run market performance. BHARs are computed for three periods: twelve, twenty-four and thirty-six months. It is a common practice in long-run event study research to have multiple holding periods in order to examine if and how the relationship between the variables of interest varies over time. We use Thomson Reuters Global Equity Indices as benchmarks (Chakrabarti, Gupta-Mukherjee and Jayaraman, 2009) in the calculation of the BHARs. The monthly returns of the sample companies and benchmarks are calculated using simple returns since they are more appropriate for measuring long-run performance as compared to continuously compounded returns (Barber and Lyon, 1997).

Independent variable: The independent variable for this study is the governance distance between the home countries of the acquiring and target company involved in an acquisition. We used the annual worldwide governance indicators developed by Kaufmann, Kraay, and Mastruzzi (2011) for this purpose. To construct the distance parameter, we subtracted the average governance index of the targets' home country from the average governance index of the acquirers' home country (as done by Ellis et al., 2017).

Control variables: We control purely for country-level factors (in line with Ellis et al., 2017). We include GDP per capita as a measure of economic development. In addition, for measuring financial development, we use the aggregate market capitalisation of all listed equities in a country in relation to the country's GDP as an approximation for the stock market size (Morresi and Pezzi, 2014). However, since this ratio also includes all foreign equities listed in a country, we also use a ratio of domestic shares traded as a percentage of their market capitalisation for an indication of a country's domestic stock market turnover. Finally, we control for the national cultural distance between the countries involved in the acquisitions using the Kogut and Singh (1988) cultural distance index. We use all six Hofstede cultural dimensions to compute the distance.

4. RESULTS

Table 1 presents the regression results for governance distance and long-term stock performance. We find support for Hypothesis 1, showing that acquirers' long-term stock market performance is negatively affected by country-level governance distance between the firms involved in a transaction. This negative relationship is observed across all three holding periods

(12 months, 24 months, and 36 months). Hypothesis 2 further predicts that the effect of governance distance is stronger when the distance is positive rather than negative, that is, when the governance score of the target country is lower than that of the acquiring country. While the estimated coefficients are negative for both positive and negative governance distance, the results provide only partial support for Hypothesis 2. Specifically, statistically significant effects are observed only when governance distance is negative and the holding period is either twelve months ($B = -0.052$, $p < 0.1$) or twenty-four months ($B = -0.101$, $p < 0.05$). No significant effects are found for positive governance distance (across all three time horizons) or for the thirty-six-month holding period when the governance distance is negative.

[Please insert Table 1 about here]

To assess the robustness of our findings, we replaced the Thomson Reuters Global Equity Indices with country-level Morgan Stanley Capital International (MSCI) indices when computing buy-and-hold abnormal returns (BHARs) (Lyon, Barber, and Tsai, 1997). We then re-tested both hypotheses using the revised BHARs and the results remain consistent with those of the main analysis. In addition, we replaced BHARs with changes in the target firm's ROA, measured over a one-year pre-acquisition and three-year post-acquisition window (−1, +3) following Zollo and Singh (2004) to capture longer-term accounting performance. The results remain consistent with our main findings. We also re-estimated the models using a different time period (2011–2016; N=319 cross-border acquisitions) and obtained similar results. Overall, these tests confirm the robustness of our findings.

5. CONCLUSION

This study extends the Portable Country Governance Theory (Ellis et al., 2017) by examining whether governance distance translates into sustained value creation. While prior evidence documents positive announcement-period reactions, our findings show that acquisitions in worse-governed countries by firms from better-governed countries are associated with negative long-term abnormal returns. Consistent with post-acquisition research highlighting integration challenges and coordination costs (Shimizu et al., 2004; King et al., 2004) and legitimacy constraints in cross-border practice transfer (Kostova, 1999; Cumming et al., 2017), governance distance appears to intensify resistance and implementation barriers that erode value over time. Hence, our key contribution is to show that governance portability is not unconditional but temporally bounded: while it generates positive announcement-period expectations, these do not translate into sustained long-term abnormal returns.

This research opens several avenues for future investigation. First, future studies should directly examine post-acquisition integration processes under varying levels and directions of governance distance, particularly focusing on resistance, legitimacy perceptions, and managerial turnover as mechanisms shaping realized outcomes (Kostova, 1999; Shimizu et al., 2004). Second, scholars should jointly assess short-run and long-run performance to better understand how initial announcement-period reactions evolve once integration challenges materialize. Third, future research may explore whether governance portability effects differ across institutional contexts, deal characteristics, or ownership structures. Finally, alternative long-run return methodologies, such as calendar-time approaches (Lyon, Barber and Tsai, 1999), would help validate the robustness of temporal effects in governance portability.

DECLARATION

ChatGPT was used only for language editing. In addition, there is no conflict of interest, and no human participants were involved in this study.

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Table 1: Regression Table

Variables		ALL (8)			DISTANCE ≥ 0 (9)			DISTANCE ≤ 0 (10)		
		BHAR_12	BHAR_24	BHAR_36	BHAR_12	BHAR_24	BHAR_36	BHAR_12	BHAR_24	BHAR_36
Country governance		-0.029* (0.016)	-0.072*** (0.025)	-0.070** (0.033)	-0.031 (0.032)	-0.077 (0.047)	-0.094 (0.074)	-0.052* (0.031)	-0.101** (0.050)	-0.082 (0.063)
GDP per capita	A	0.003* (0.002)	0.006** (0.003)	0.009** (0.004)	0.006** (0.003)	0.009* (0.005)	0.009 (0.008)	0.003 (0.002)	0.005 (0.004)	0.011** (0.005)
	T	0.0005 (0.002)	0.001 (0.003)	0.000 (0.004)	-0.003 (0.003)	-0.001 (0.005)	-0.004 (0.007)	0.001 (0.002)	0.001 (0.004)	0.002 (0.005)
Stock market size	A	-0.001 (0.006)	0.015 (0.010)	0.012 (0.014)	-0.012 (0.008)	0.003 (0.012)	0.013 (0.021)	0.011 (0.009)	0.027 (0.017)	0.013 (0.019)
	T	-0.014** (0.005)	-0.028*** (0.010)	-0.030*** (0.011)	-0.002 (0.009)	-0.022 (0.015)	-0.042** (0.017)	-0.022** (0.007)	-0.030** (0.013)	-0.021 (0.015)
Domestic stock market turnover	A	0.003 (0.006)	-0.003 (0.010)	-0.006 (0.012)	-0.003 (0.010)	-0.023* (0.014)	-0.005 (0.020)	0.011 (0.009)	0.012 (0.015)	-0.003 (0.017)
	T	-0.001 (0.005)	0.006 (0.008)	0.003 (0.010)	0.0002 (0.008)	0.010 (0.012)	0.011 (0.016)	-0.006 (0.008)	0.004 (0.014)	-0.006 (0.017)
Cultural distance		0.016 (0.013)	0.073*** (0.023)	0.076** (0.030)	-0.014 (0.025)	0.075 (0.048)	0.025 (0.067)	0.042** (0.020)	0.085** (0.037)	0.108** (0.046)
COSTANT		-0.025 (0.100)	-0.205 (0.176)	-0.141 (0.227)	0.029 (0.152)	-0.060 (0.234)	0.046 (0.347)	-0.154 (0.159)	-0.462 (0.329)	-0.382 (0.375)
Observations		858	851	846	401	397	394	457	454	452
F-Statistic		1.94	4.54	3.23	0.93	2.14	1.54	2.57	2.79	2.23
Prob > F (Sig.)		.051	< .001	.001	.494	.032	.142	.010	.005	.024
R-Squared		.017	.038	.027	.015	.042	.029	.037	.042	.032
Adj. R-		.008	.029	.018	-.005	.023	.009	.020	.024	.014

Squared

***p < .01; **p < .05; *p < .1. Robust standard errors in parentheses reported under the regression coefficients.

P stands for the party of the transaction, where A is the abbreviation for acquirer and T for target.

The Cost of Dividend Stability: Earnings Management Behind Payout Decisions

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Abstract

Dividend policy remains one of the most visible and symbolically important decisions in corporate finance. Stable dividends are commonly interpreted as signals of firm strength, earnings persistence, and managerial confidence. Yet the market penalty associated with dividend cuts may create incentives for managers to preserve payout stability even when underlying performance weakens. This study examines whether firms engage in earnings management to sustain dividends and avoid the negative signal of dividend reduction. The paper connects two major strands of literature that are usually examined separately: dividend smoothing and earnings management. Prior research shows that managers are reluctant to cut dividends because such actions often trigger adverse investor reactions. At the same time, the earnings management literature documents that managers use accounting discretion to meet benchmarks, protect reputation, and influence market perceptions. This study argues that dividend continuity may itself function as a benchmark, encouraging managers to manipulate reported earnings in order to justify stable payouts. Grounded in signaling theory and agency theory, the study proposes that firms facing stronger pressure to maintain dividends are more likely to report higher discretionary accruals. This association may be particularly pronounced where monitoring is weak, external financing is costly, or investor protection is limited. Empirically, the study focuses on listed non-financial firms and models earnings management as a function of dividend stability measures, while controlling for profitability, leverage, firm size, growth opportunities, and cash flow characteristics. Earnings management is proxied using discretionary accruals based on established accrual models, including the Modified Jones framework. The analysis is expected to employ firm and year fixed effects to address unobserved heterogeneity. The study contributes by reframing dividend stability as a potentially costly outcome rather than an unambiguously positive signal. It extends the earnings management literature by identifying dividend preservation as a distinct managerial benchmark and offers practical implications for investors, auditors, and regulators evaluating the credibility of stable payout policies.

Performance Relative to Aspirations and Corporate Risk-Taking: What are the firm-and institutional contingencies?

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This study develops a theoretical framework to explain how firms' performance relative to historical aspirations influences their risk-taking behavior. Building on the Behavioral Theory of the Firm (BTOF), we argue that firms evaluate performance relative to aspiration levels derived from their own historical performance and adjust their strategic actions accordingly. Specifically, firms performing below historical aspirations are expected to engage in greater risk-taking as they attempt to close performance gaps, while firms performing above aspirations exhibit risk-averse behavior to preserve gains. However, we contend that this relationship is contingent upon three critical boundary conditions: the cost of external financing, proximity to bankruptcy, and managerial agency motives. We propose that high external financing costs constrain risk-taking under negative performance feedback, while proximity to bankruptcy amplifies precautionary behavior and may suppress risk-taking despite performance shortfalls. Furthermore, managerial agency motives introduce divergence between firm-level and managerial-level incentives, shaping risk preferences in complex ways. By integrating insights from BTOF, corporate finance, and agency theory, this paper contributes to a more nuanced understanding of risk-taking behavior under performance feedback. We conclude with implications for theory, practice, and future research.

Keywords: Performance, aspirations, risk-taking, behavioral theory of the firm

1. Introduction

Understanding why firms take risks remains a central question in strategic management and corporate finance. Risk-taking is fundamental to innovation, competitive advantage, and long-term growth, yet excessive or insufficient risk can lead to suboptimal outcomes or firm failure. While traditional economic models assume that firms make risk decisions based on expected returns and rational optimization, a growing body of research suggests that firms' risk behaviors are strongly shaped by performance feedback mechanisms (Cyert & March, 1963; Greve, 2003).

The Behavioral Theory of the Firm (BTOF) posits that firms evaluate their performance relative to aspiration levels and adjust their behavior accordingly. When performance falls below aspirations, firms engage in "problemistic search," often increasing risk-taking in an effort to improve outcomes. Conversely, when performance exceeds aspirations, firms tend to become more risk-averse, focusing on preserving gains rather than pursuing uncertain opportunities (March & Shapira, 1987; Greve, 1998).

Despite the extensive literature on performance feedback and risk-taking, several important gaps remain. First, prior research has often treated the relationship between performance relative to aspirations and risk-taking as relatively uniform, overlooking important boundary conditions that may shape this relationship. Second, the majority of studies focus on aspiration-performance gaps without adequately considering financial constraints and institutional conditions that influence firms' ability to act on these signals. Third, the role of managerial agency motives in

shaping risk responses to performance feedback has received limited theoretical integration with BTOF.

This paper addresses these gaps by developing a theoretical model that examines how performance relative to **historical aspirations** influences risk-taking and how this relationship is moderated by (1) the cost of external financing, (2) proximity to bankruptcy, and (3) managerial agency motives.

Our central research question is:

How does performance relative to historical aspirations influence firms' risk-taking behavior, and how is this relationship shaped by financial constraints and managerial incentives?

We argue that while performance below historical aspirations generally increases risk-taking, this effect is contingent upon the firm's financial environment and managerial motivations. High costs of external financing constrain the ability to pursue risky initiatives, proximity to bankruptcy shifts focus toward survival rather than experimentation, and agency motives may either amplify or distort risk-taking depending on managerial incentives.

This study makes several theoretical contributions. First, it extends BTOF by integrating financial constraints into the performance feedback–risk-taking relationship. Second, it bridges strategic management and corporate finance by incorporating external financing costs and bankruptcy risk into behavioral models. Third, it introduces managerial agency motives as a critical boundary condition, offering a more nuanced understanding of how individual-level incentives shape firm-level behavior.

2. Theoretical Propositions

The Behavioral Theory of the Firm (BTOF) posits that firms evaluate their performance relative to aspiration levels, which function as reference points guiding decision-making (Cyert & March, 1963; Greve, 2003). Among different aspiration types, historical aspirations—based on a firm's own past performance—are particularly influential because they are internally generated, salient, and psychologically binding (Greve, 1998). When current performance falls below these historical benchmarks, firms experience a performance shortfall that signals a failure to meet internally expected standards.

This shortfall activates problemistic search, a process through which firms seek solutions to close the performance gap. Importantly, problemistic search is not random but directed and urgency-driven, often pushing firms toward actions that differ from established routines (Cyert & March, 1963). Because incremental adjustments are often insufficient to close meaningful performance gaps, firms are more likely to engage in non-routine, uncertain, and resource-intensive actions, which inherently involve greater risk (Greve, 2003; Chen & Miller, 2007).

From a behavioral perspective, this tendency is reinforced by prospect theory (Kahneman & Tversky, 1979), which suggests that decision-makers become risk-seeking in the domain of losses. When firms perform below historical aspirations, they interpret their situation as a loss relative to a reference point. Under such conditions, the perceived marginal utility of risky actions increases because maintaining the status quo guarantees continued underperformance, whereas risk-taking offers a chance of recovery. Thus, risk-taking becomes a behaviorally rational response to negative performance feedback.

Moreover, performance shortfalls reduce the attractiveness of existing strategies and weaken organizational commitment to current routines (Lant & Mezias, 1992). This erosion of routine-based inertia further facilitates risk-taking by lowering resistance to change. In addition, firms below aspirations often experience heightened attention allocation to performance problems,

leading managers to prioritize actions with high potential impact, even if they involve substantial uncertainty (Ocasio, 1997).

However, it is important to note that not all risk-taking is equally likely. Firms are more inclined to engage in strategic risk-taking—such as R&D investment, acquisitions, or entry into new markets—that directly addresses performance gaps. These actions typically involve long-term uncertainty and substantial resource commitments, making them inherently risky.

Taken together, the combination of problemistic search, loss-domain risk preferences, reduced inertia, and heightened attention to performance gaps leads to a systematic increase in risk-taking when firms perform below historical aspirations.

Proposition 1: *Performance below historical aspirations is positively associated with firm risk-taking.*

Although performance shortfalls create a strong behavioral motivation to take risks, firms' ability to act on this motivation depends critically on their access to financial resources. Risk-taking activities—such as innovation, acquisitions, and strategic reorientation—are typically capital-intensive and require substantial upfront investment (Bromiley, 1991; O'Brien, 2003). When internal resources are insufficient, firms must rely on external financing, making the cost of external capital a key constraint on risk-taking behavior.

From a corporate finance perspective, high external financing costs arise due to information asymmetries, agency problems, and market frictions (Myers & Majluf, 1984; Fazzari et al., 1988). When financing is expensive, the effective hurdle rate for investment increases, reducing the net present value of risky projects and discouraging investment in uncertain opportunities. This creates a tension between behavioral motivation (to take risks) and financial feasibility (ability to fund risks).

Importantly, the constraint imposed by high financing costs is particularly binding for firms performing below aspirations. Such firms often exhibit weaker financial performance, lower creditworthiness, and higher perceived risk, which further increases the cost of external capital (Whited & Wu, 2006). As a result, even though these firms are more motivated to engage in risk-taking, they face greater financial barriers to doing so.

In addition, high financing costs increase the downside consequences of failure. When external capital is expensive, unsuccessful risky investments impose heavier financial burdens, potentially exacerbating existing performance problems. This amplifies managerial caution and reduces willingness to undertake uncertain projects, even under strong problemistic search pressures.

From a behavioral standpoint, high financing costs also alter the perceived risk-return trade-off. Managers may reinterpret risky projects as less attractive because the costs of failure are more salient and immediate, while the benefits remain uncertain and distant. This shifts decision-making away from risk-seeking behavior, even in the presence of performance shortfalls.

Therefore, while performance below historical aspirations increases the motivation for risk-taking, high external financing costs constrain the ability to act on this motivation, weakening the relationship.

Proposition 2: *The positive relationship between performance below historical aspirations and risk-taking is weakened when the cost of external financing is high.*

Proximity to bankruptcy represents an extreme form of financial distress that fundamentally alters firms' strategic priorities and decision-making processes. As firms approach bankruptcy, survival becomes the dominant objective, often overriding other goals such as growth or performance improvement (Opler et al., 1999; Campello et al., 2010).

At moderate levels of underperformance, BTOF predicts increased risk-taking due to problemistic search. However, when firms are close to bankruptcy, the situation changes qualitatively rather than merely quantitatively. The potential costs of failure become existential, leading to a shift from aspiration-driven behavior to survival-driven behavior.

Several mechanisms explain why proximity to bankruptcy weakens the tendency to take risks. First, financially distressed firms face severe resource constraints, limiting their ability to invest in risky projects. Second, they are subject to heightened monitoring by creditors and stakeholders, which restricts managerial discretion and discourages risky actions (Jensen, 1986). Third, bankruptcy risk increases the likelihood that the firm will not capture the long-term benefits of risky investments, reducing the attractiveness of such actions.

From a behavioral perspective, extreme distress may shift decision-makers from a risk-seeking loss domain to a fear-driven avoidance mode. While prospect theory predicts risk-seeking behavior in losses, it does not fully account for situations where losses threaten survival. In such cases, managers may prioritize loss minimization and damage control over risk-taking.

Moreover, proximity to bankruptcy increases the salience of short-term liquidity needs, leading firms to conserve cash rather than commit resources to uncertain long-term projects. This results in a preference for defensive strategies, such as cost-cutting, asset divestment, and retrenchment, rather than risky investments (Hofer, 1980).

Thus, although performance below aspirations generally increases risk-taking, this effect is attenuated when firms are close to bankruptcy, as survival concerns dominate strategic decision-making.

Proposition 3: *The positive relationship between performance below historical aspirations and risk-taking is weakened as firms approach bankruptcy.*

While BTOF focuses on firm-level responses to performance feedback, it implicitly assumes alignment between organizational goals and managerial actions. However, agency theory suggests that managers may pursue actions that maximize their own utility rather than firm value (Jensen & Meckling, 1976). This introduces an additional layer of complexity in understanding risk-taking behavior under performance shortfalls.

Managerial agency motives can influence risk-taking in two opposing ways. On one hand, managers with strong career concerns may exhibit risk aversion, particularly when poor performance threatens their job security (Holmström, 1999). In such cases, managers may avoid risky projects to minimize the likelihood of failure and protect their positions, thereby weakening the relationship between performance shortfalls and risk-taking.

On the other hand, agency motives may also encourage excessive risk-taking. Managers whose compensation is tied to short-term performance or who face limited downside risk (e.g., due to limited liability) may engage in gambling for resurrection, taking high-risk actions in an attempt to quickly improve performance (Jensen & Meckling, 1976; Rajan, 2006). In such cases, risk-taking is not driven purely by problemistic search but also by self-interested incentives.

Furthermore, managerial discretion plays a critical role. In firms with weak governance structures, managers have greater freedom to pursue risk-taking strategies that align with their personal incentives. Conversely, strong governance mechanisms may constrain managerial opportunism and align risk-taking with firm value.

Importantly, the interaction between performance feedback and agency motives creates heterogeneous responses across firms. Two firms facing identical performance shortfalls may exhibit very different risk-taking behaviors depending on managerial incentives and governance structures.

Thus, managerial agency motives act as a key moderator that shapes how firms translate performance shortfalls into risk-taking behavior.

Proposition 4: *Managerial agency motives moderate the relationship between performance below historical aspirations and risk-taking such that the relationship is stronger when managerial incentives favor risk-taking and weaker when they favor risk aversion.*

3. Discussion and Conclusion

This study develops a comprehensive theoretical framework explaining how firms' performance relative to historical aspirations shapes their risk-taking behavior and how this relationship is contingent upon key financial and managerial boundary conditions. Building on the Behavioral Theory of the Firm (BTOF), we argue that performance shortfalls relative to internally constructed benchmarks trigger problemistic search and increase risk-taking. However, we demonstrate that this relationship is far from uniform and is systematically shaped by the cost of external financing, proximity to bankruptcy, and managerial agency motives.

Our framework advances a more nuanced understanding of risk-taking by highlighting the interaction between behavioral motivation and structural constraints. While BTOF emphasizes that firms respond to performance feedback through adaptive search processes (Cyert & March, 1963; Greve, 2003), our model shows that such responses are filtered through financial feasibility and incentive alignment. In doing so, we move beyond a purely behavioral account toward a contingent behavioral perspective, where risk-taking emerges from the interplay of cognitive, financial, and organizational forces.

Consistent with prior research, we posit that performance below historical aspirations increases firms' willingness to engage in risk-taking due to problemistic search and loss-domain preferences (Greve, 1998; Kahneman & Tversky, 1979). However, we extend this logic by demonstrating that the translation of behavioral motivation into actual strategic action depends critically on resource availability and constraints. This insight aligns with emerging work suggesting that behavioral responses to performance feedback are often bounded by resource endowments and environmental conditions (Chen & Miller, 2007; Posen, Keil, Kim, & Meissner, 2018).

Furthermore, our framework highlights that extreme conditions—such as financial distress—can fundamentally alter behavioral responses. While moderate performance shortfalls encourage risk-taking, proximity to bankruptcy shifts the firm's objective function toward survival, thereby suppressing risk-seeking behavior. This suggests that the relationship between performance feedback and risk-taking is nonlinear and context-dependent, echoing calls in the literature to move beyond simple monotonic models (Miller & Chen, 2004; Shinkle, 2012).

Finally, by incorporating managerial agency motives, we emphasize that organizational responses to performance feedback are not purely collective or firm-level phenomena but are shaped by individual-level incentives and discretion (Jensen & Meckling, 1976; Wiseman & Gomez-Mejia, 1998). This integration provides a more complete account of risk-taking by recognizing that managers interpret and act upon performance signals in ways that reflect their own incentives and constraints.

3.1. Theoretical Contributions

This study makes several important contributions to the literature on behavioral strategy, corporate finance, and organizational decision-making. First, this study extends the Behavioral Theory of the Firm by explicitly incorporating financial constraints—particularly external financing costs—into the performance feedback framework. While BTOF has traditionally

emphasized cognitive and behavioral processes (Cyert & March, 1963; Greve, 2003), it has paid comparatively less attention to the financial conditions that enable or constrain organizational responses. By integrating insights from corporate finance, we demonstrate that even when firms are strongly motivated to engage in risk-taking due to performance shortfalls, their ability to do so is contingent upon access to capital and the cost of external financing (Fazzari et al., 1988; Myers & Majluf, 1984). This contribution responds to recent calls for greater integration between behavioral strategy and financial economics (Bromiley, Rau, & Zhang, 2017) and highlights that behavioral intentions and financial feasibility are jointly necessary for strategic action.

Second, this study contributes to the literature by identifying proximity to bankruptcy as a critical boundary condition that fundamentally alters the performance feedback–risk-taking relationship. While prior research has documented that firms increase risk-taking under negative performance feedback (Greve, 1998; Chen & Miller, 2007), less attention has been paid to how extreme financial distress modifies this behavior. Our framework suggests that when firms approach bankruptcy, survival concerns dominate, leading to a shift from risk-seeking to risk-averse behavior. This contribution aligns with and extends research on organizational decline and turnaround strategies (Hofer, 1980; Trahms, Ndofor, & Sirmon, 2013), emphasizing that the logic of problemistic search may break down under extreme conditions. In doing so, we contribute to a more refined understanding of when and why firms deviate from standard behavioral predictions.

Third, this study advances the literature by integrating managerial agency motives into the performance feedback framework, thereby linking firm-level behavioral theory with individual-level incentive structures. While BTOF assumes that firms respond to performance gaps in a relatively unified manner, agency theory highlights that managers may have divergent interests that shape their decision-making (Jensen & Meckling, 1976). By incorporating managerial incentives, we show that the relationship between performance shortfalls and risk-taking is contingent upon whether managers are incentivized to take risks or avoid them. This integration builds on and extends prior work on managerial risk preferences (Wiseman & Gomez-Mejia, 1998; Sanders & Hambrick, 2007) and contributes to a more micro-founded understanding of organizational behavior. More broadly, this study contributes to the literature by reconceptualizing risk-taking as a contingent outcome shaped by the interaction of behavioral, financial, and agency mechanisms. Rather than viewing risk-taking as a direct response to performance feedback, we show that it is the result of multiple interacting forces that may reinforce or counteract one another.

This perspective aligns with recent calls for more integrative and multi-theoretical approaches in strategic management (Bromiley & Rau, 2016) and provides a richer understanding of how firms navigate uncertainty and performance pressures.

3.3 Implications for Research

This study opens several promising avenues for future research. First, future studies can empirically test the proposed hypotheses using large-scale panel data across countries, allowing researchers to examine how institutional environments shape the proposed relationships. For instance, variations in financial market development, creditor rights, and governance systems may influence the strength of the moderating effects (La Porta et al., 1998; Demirgüç-Kunt & Levine, 1999).

Second, future research can explore nonlinear dynamics in the relationship between performance feedback and risk-taking. Our framework suggests that the relationship may shift from positive to negative as firms move from moderate underperformance to extreme distress, indicating the need for models that capture threshold effects (Miller & Chen, 2004).

Third, scholars can further investigate the microfoundations of performance feedback, examining how individual-level cognition, attention allocation, and managerial characteristics shape organizational responses (Ocasio, 1997; Gavetti, 2005).

Fourth, future studies can examine additional moderators, such as organizational slack, corporate governance mechanisms, and national culture, which may further shape risk-taking behavior (Crossland & Hambrick, 2011; Daniel et al., 2008).

3.4 Implications for Practice and Policy

This study also offers important implications for managers, investors, and policymakers. For managers, our findings highlight the importance of aligning risk-taking decisions with both performance conditions and financial capacity. While performance shortfalls may create pressure to take risks, managers must carefully consider whether their firms have the resources and capabilities to support such actions. Overly aggressive risk-taking under financial constraints may exacerbate problems rather than resolve them. Additionally, managers should recognize how their own incentives shape decision-making. Ensuring that compensation structures align managerial interests with long-term firm value can help mitigate excessive or insufficient risk-taking (Jensen & Murphy, 1990).

For investors, this study suggests that firms' risk-taking behavior cannot be fully understood without considering performance feedback and contextual factors. Investors should evaluate whether risk-taking reflects strategic adaptation to performance shortfalls or is driven by managerial opportunism or financial distress. Understanding these dynamics can improve investment decisions and help investors distinguish between productive risk-taking and value-destructive behavior.

For policymakers, the findings underscore the importance of reducing financial frictions and improving access to capital markets. Lower financing costs can enable firms to engage in productive risk-taking, particularly when responding to performance challenges (Rajan & Zingales, 1998). At the same time, policies aimed at preventing excessive financial distress—such as bankruptcy protection and restructuring mechanisms—can help firms avoid the transition from adaptive risk-taking to survival-driven conservatism.

3.5 Limitations

Despite its contributions, this study has several limitations. First, the framework is theoretical and requires empirical validation. While we draw on established theories and prior evidence, future research is needed to test the proposed relationships. Second, the study focuses on historical aspirations and does not explicitly consider social aspirations, which may interact with historical benchmarks in shaping behavior (Greve, 2003). Third, while we incorporate three key moderators, other important factors—such as institutional environments and industry characteristics—may also influence the relationship.

3.6 Concluding Remarks

In conclusion, this study advances our understanding of corporate risk-taking by developing a comprehensive theoretical framework that integrates behavioral theory, corporate finance, and agency theory. We show that performance relative to historical aspirations is a powerful driver of risk-taking, but its effects are contingent upon financial constraints and managerial incentives.

By highlighting the interplay between behavioral motivation and structural constraints, this study contributes to a more nuanced and realistic understanding of firm behavior. We hope that this framework stimulates further research at the intersection of behavioral strategy and corporate finance and provides valuable insights for scholars and practitioners alike.

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Mitigating Bankruptcy Risk Under Negative Performance Feedback: What are the Key Enablers?

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Abstract

Why do some firms avoid bankruptcy despite persistent underperformance and proximity to distress, while others fail? This paper develops a theoretical framework explaining the factors that help firms mitigate bankruptcy risk when they perform below aspirations and move closer to bankruptcy. Drawing on the Behavioral Theory of the Firm, organizational decline and turnaround research, the resource-based view, stakeholder theory, and corporate governance theory, we argue that firms facing negative performance feedback are not uniformly destined for failure. Instead, their ability to reduce bankruptcy risk depends on a set of organizational, financial, strategic, and governance conditions that shape whether they can respond adaptively to distress. Specifically, we theorize that financial slack, asset redeployability, creditor and stakeholder support, strategic retrenchment capability, governance effectiveness, and top management turnaround capacity reduce the likelihood that firms below aspirations will transition from underperformance to bankruptcy. In contrast to perspectives that emphasize risk-taking escalation under poor performance, this paper highlights the organizational conditions that enable survival, stabilization, and recovery. The paper makes three main contributions. First, it extends behavioral theory by shifting attention from risk-taking to survival-preserving responses under extreme negative performance feedback. Second, it integrates performance feedback theory with the turnaround and bankruptcy literatures. Third, it develops a multi-factor framework identifying the mechanisms through which firms can arrest decline before bankruptcy occurs. We conclude with implications for theory, practice, and public policy, and outline directions for future research.

Keywords: Aspirations, bankruptcy, financial distress, organizational survival

1. Introduction

Firm bankruptcy is one of the most consequential outcomes in strategy, entrepreneurship, and corporate finance. Bankruptcy destroys shareholder value, disrupts supplier and creditor relationships, jeopardizes employee welfare, and may generate broader spillovers across industries and regions (Altman, 1984; Hotchkiss, John, Mooradian, & Thorburn, 2008). Yet bankruptcy is not an automatic outcome of poor performance. Many firms endure extended periods of underperformance, move close to financial distress, and still survive. This variation raises a central question: *what enables some firms to mitigate bankruptcy risk when they perform below aspirations and approach distress?*

The Behavioral Theory of the Firm (BTOF) provides an important starting point for answering this question. BTOF argues that firms compare current performance to aspiration levels and respond when outcomes fall below those benchmarks (Cyert & March, 1963; Greve, 2003). Performance shortfalls trigger problemistic search, increased attention to performance gaps, and departures from established routines. Much of the performance feedback literature has therefore focused on whether firms below aspirations increase innovation, strategic change, acquisitions, divestitures, or risk-taking (Greve, 1998; Shinkle, 2012; Posen, Keil, Kim, & Meissner, 2018).

However, when firms are not merely underperforming but are also approaching bankruptcy, the central strategic question changes. In such settings, the issue is not simply whether firms search or take risks, but whether they possess the conditions necessary to avoid organizational failure.

This shift in emphasis matters because underperformance near bankruptcy differs qualitatively from ordinary performance shortfalls. At moderate levels of underperformance, firms may respond by experimenting or taking greater strategic risks. But as firms near bankruptcy, survival concerns, liquidity pressures, creditor scrutiny, and stakeholder withdrawal intensify (Hofer, 1980; Trahms, Ndofor, & Sirmon, 2013). Under such circumstances, the key issue becomes whether the firm can stabilize itself, preserve legitimacy, retain access to critical resources, and execute corrective actions before distress escalates into formal failure. Existing theory has not sufficiently integrated these dynamics.

Three important gaps follow. First, the performance feedback literature has rarely examined the survival-preserving conditions that help firms below aspirations avoid bankruptcy once distress becomes acute. Second, turnaround and bankruptcy research has identified many relevant factors, such as retrenchment, creditor support, and leadership change, but has often treated distress in economic or operational terms without integrating the performance-feedback mechanisms that explain when firms become attentive to survival threats (Pearce & Robbins, 1993; Daily, 1995). Third, the literature lacks an integrative framework linking negative performance feedback, proximity to bankruptcy, and the organizational conditions that reduce failure risk.

This paper addresses these gaps by asking: *What factors help firms mitigate bankruptcy risk when they perform below aspirations and move close to bankruptcy?*

We argue that firms below aspirations and close to distress are more likely to mitigate bankruptcy risk when they possess or can mobilize six major conditions: financial slack, asset redeployability, stakeholder support, strategic retrenchment capability, governance effectiveness, and top management turnaround capacity. Each factor operates through a different mechanism. Financial slack buys time and preserves discretion. Redeployable assets allow firms to raise liquidity and reconfigure operations. Stakeholder support preserves access to resources and cooperation. Retrenchment capability reduces cash burn and stabilizes operations. Effective governance increases timely intervention and reduces inertia or self-serving escalation. Turnaround-capable leaders improve diagnosis, prioritization, and execution under distress.

This study makes at least three theoretical contributions. First, it extends the Behavioral Theory of the Firm by shifting focus from risk-taking and search to bankruptcy-risk mitigation under severe negative feedback. In doing so, it highlights that the consequences of underperformance depend not only on search intensity but also on whether firms possess survival-enabling conditions. Second, it bridges the performance feedback literature with the organizational decline, turnaround, and bankruptcy literatures by showing how aspiration shortfalls activate the need for correction while organizational and financial conditions determine whether correction succeeds. Third, it develops a multi-factor framework that explains why some firms arrest decline and survive whereas others transition from underperformance into bankruptcy.

The rest of the paper proceeds as follows. We first discuss the theoretical foundations linking performance below aspirations to bankruptcy risk. We then develop a set of Propositions regarding the factors that help firms reduce bankruptcy risk when close to bankruptcy. Finally, we discuss the study's contributions, limitations, and implications for research, practice, and policy.

2. Theoretical Background

2.1 Performance Below Aspirations and the Escalation of Distress

The Behavioral Theory of the Firm proposes that aspiration levels serve as reference points against which firms evaluate current performance (Cyert & March, 1963; Greve, 2003). When firms perform below aspirations, they experience a discrepancy between expected and realized outcomes, which activates problemistic search. Such search can stimulate change, but it does not guarantee successful adaptation. In some cases, especially under severe resource constraints or deteriorating stakeholder confidence, repeated underperformance may instead accelerate decline (Lant, Milliken, & Batra, 1992; Miller & Chen, 2004).

Importantly, performance below aspirations often leads to increased managerial attention, but attention alone is insufficient. Firms must also possess the means to respond. If resources are depleted, creditors tighten constraints, and stakeholders withdraw support, negative feedback may culminate in distress rather than adaptation (Hambrick & D'Aveni, 1988). Thus, when firms are close to bankruptcy, the central challenge is no longer simply recognizing a performance problem; it is whether the firm has the capacity to mitigate the growing risk of failure.

2.2 Bankruptcy Risk as an Organizational and Strategic Outcome

Bankruptcy risk is not solely a financial ratio outcome; it is also the product of organizational capabilities, stakeholder relationships, leadership actions, and strategic responses to decline (Daily, Dalton, & Cannella, 2003; Trahms et al., 2013). Research on turnaround and decline suggests that successful survival requires timely retrenchment, resource reconfiguration, credible leadership, and stakeholder cooperation (Hofer, 1980; Pearce & Robbins, 1993). Resource-based and stakeholder perspectives similarly indicate that firms survive distress when they preserve access to valuable resources and maintain support from critical constituencies (Barney, 1991; Freeman, 1984).

Accordingly, firms below aspirations and near bankruptcy do not all face identical outcomes. Their bankruptcy risk depends on whether they can access liquidity, convert assets, secure stakeholder patience, govern effectively, and execute corrective action. The following section develops Propositions on these survival-preserving factors.

3. Propositions

Financial Slack and Bankruptcy-Risk Mitigation: Financial slack refers to excess liquid or quasi-liquid resources that organizations can deploy flexibly in response to threats and opportunities (Bourgeois, 1981; Daniel, Lohrke, Fornaciari, & Turner, 2004). When firms perform below aspirations and move close to bankruptcy, financial slack becomes especially valuable because it extends the time horizon available for corrective action. Firms nearing distress often face immediate cash flow pressures, debt-service obligations, and operational commitments that can force them into failure before strategic recovery efforts have time to work (Opler, Pinkowitz, Stulz, & Williamson, 1999).

Slack mitigates bankruptcy risk through several mechanisms. First, it provides **liquidity buffering**, enabling firms to continue operations, meet obligations, and avoid forced default while they evaluate and implement restructuring measures. Second, slack preserves managerial discretion, allowing leaders to choose among alternatives rather than accept fire-sale asset sales, coercive financing, or value-destructive retrenchment under duress. Third, slack reduces the probability of stakeholder panic. Creditors, suppliers, and employees are less likely to disengage when a firm can demonstrate short-term solvency and operational continuity.

From a behavioral perspective, slack also changes how firms respond to negative performance feedback. Firms below aspirations without slack may perceive only one viable option: desperate and often destructive short-term measures. By contrast, firms with slack can engage in more deliberate and selective search, prioritizing actions that stabilize the organization without undermining long-term recovery. Thus, while underperformance increases the urgency to respond,

financial slack determines whether response remains feasible and orderly rather than chaotic and failure-inducing.

Accordingly, firms performing below aspirations and approaching bankruptcy should be better able to mitigate bankruptcy risk when they possess greater financial slack.

Proposition 1: *Among firms performing below aspirations and approaching financial distress, greater financial slack is associated with lower bankruptcy risk.*

Asset Redeployability and Bankruptcy-Risk Mitigation: Asset redeployability refers to the extent to which a firm's assets can be sold, leased, repurposed, or transferred to alternative uses without severe loss of value (Shleifer & Vishny, 1992; Kim & Bettis, 2014). As firms move closer to bankruptcy, the ability to convert assets into liquidity or adapt them to more viable operations becomes a critical survival mechanism.

Redeployable assets mitigate bankruptcy risk in at least three ways. First, they provide firms with a means of raising cash without necessarily destroying the core business. Distressed firms with marketable noncore assets, real estate, business units, or fungible equipment can generate liquidity, repay debt, and reduce immediate solvency pressures. Second, redeployable assets enhance strategic flexibility. Firms can shrink, reconfigure, or refocus more readily when their assets are not rigidly tied to obsolete products, locations, or technologies. Third, asset redeployability increases bargaining power with creditors and investors, because it signals the presence of realizable collateral and recovery value.

In contrast, firms whose assets are highly specific, illiquid, or difficult to transfer face more severe distress once they approach bankruptcy. These firms may be unable to raise liquidity except through costly or deeply discounted asset sales, which further impair recovery. As a result, performance below aspirations becomes more likely to translate into irreversible decline.

Behaviorally, redeployable assets reduce the severity of the threat posed by underperformance. They widen the set of feasible responses and lower the perceived irreversibility of corrective action. This matters especially when firms are close to bankruptcy, because the difference between recoverable and unrecoverable distress often depends on whether resources can still be mobilized in time.

Proposition 2: *Among firms performing below aspirations and approaching financial distress, greater asset redeployability is associated with lower bankruptcy risk.*

Stakeholder Support and Bankruptcy-Risk Mitigation: When firms approach bankruptcy, survival depends not only on internal resources but also on continued support from external and internal stakeholders, including creditors, suppliers, customers, employees, and sometimes governments or affiliated business partners (Freeman, 1984; Titman, 1984). Stakeholders can either accelerate decline by withdrawing cooperation or mitigate bankruptcy risk by offering patience, concessions, and continued access to critical resources.

Stakeholder support reduces bankruptcy risk through several mechanisms. Creditors may restructure obligations, waive covenants, extend maturities, or provide bridge financing. Suppliers may continue trade credit. Customers may sustain demand if they retain confidence in the firm's continuity. Employees may accept temporary sacrifices or remain committed despite uncertainty. Each of these actions helps reduce the speed with which distress escalates into insolvency.

Stakeholder theory suggests that firms that have accumulated relational capital and legitimacy are more likely to receive such support during difficult periods (Freeman, 1984; Hillman & Keim, 2001). Similarly, research on distress indicates that trust and prior relational quality shape whether stakeholders behave cooperatively when firms encounter decline (Barker & Duhaime, 1997). Firms that have historically extracted value from stakeholders without reciprocity may find that support evaporates precisely when it is most needed.

From a performance-feedback perspective, stakeholder support conditions the consequences of underperformance. Negative feedback may trigger managerial efforts to recover, but those efforts require a cooperative environment. Even well-designed turnaround actions are difficult to implement if creditors force liquidation, suppliers cut off inputs, or key employees exit. Thus, stakeholder support functions as a social and economic buffer that helps preserve the organization long enough for corrective actions to take effect.

Proposition 3: *Among firms performing below aspirations and approaching financial distress, stronger stakeholder support is associated with lower bankruptcy risk.*

Strategic Retrenchment Capability and Bankruptcy-Risk Mitigation: Retrenchment refers to actions aimed at reducing costs, divesting peripheral activities, shrinking scale, and restoring efficiency and liquidity under decline (Hofer, 1980; Robbins & Pearce, 1992). However, what matters is not merely whether firms retrench, but whether they possess the **capability** to retrench strategically and effectively. Strategic retrenchment capability is the organizational ability to identify what must be cut, what must be preserved, and how to execute contraction without collapsing the business.

This capability mitigates bankruptcy risk because distress often reflects not only weak revenues but also rigid cost structures, misaligned commitments, and slow adaptation. Firms near bankruptcy that can quickly reduce cash burn, eliminate nonessential expenditures, simplify operations, and refocus on viable activities are better positioned to stabilize. By contrast, firms that retrench indiscriminately may cut strategic assets, damage morale, and undermine future recovery.

Turnaround research suggests that retrenchment is often a necessary first step in survival because it restores breathing room and credibility (Pearce & Robbins, 1993; Trahms et al., 2013). Yet retrenchment is effective only when it is selective and disciplined. Firms need the analytical ability to distinguish core from peripheral operations, the political capacity to overcome internal resistance, and the implementation discipline to act quickly before distress deepens.

Underperformance below aspirations heightens the need for corrective action, but the bankruptcy consequences of that underperformance depend on whether the firm can translate urgency into coherent contraction rather than reactive chaos. Firms with strong retrenchment capability should therefore be better able to interrupt the progression from aspiration shortfalls to bankruptcy.

Proposition 4: *Among firms performing below aspirations and approaching financial distress, stronger strategic retrenchment capability is associated with lower bankruptcy risk.*

Governance Effectiveness and Bankruptcy-Risk Mitigation: Corporate governance becomes especially important when firms face severe underperformance and growing bankruptcy risk. Governance effectiveness refers to the ability of boards and oversight structures to monitor management, recognize deteriorating conditions, challenge failing strategies, and support timely corrective action (Daily & Dalton, 1994; Zahra & Pearce, 1989).

Governance mitigates bankruptcy risk in several ways. First, effective boards are more likely to detect persistent underperformance early and interpret it as a signal requiring substantive intervention. Second, governance reduces the risk of **escalation of commitment**, whereby managers continue failing strategies due to ego, self-justification, or career concerns (Staw, 1976). Third, boards can facilitate leadership changes, restructuring decisions, asset sales, and negotiations with creditors. Fourth, effective governance may enhance external credibility, making investors and lenders more willing to support recovery efforts.

This factor is particularly important under performance below aspirations because managers do not always respond optimally to negative feedback. Some engage in denial, delay, impression management, or gambling for resurrection. Agency theory suggests that managers' incentives may

diverge from firm survival, particularly when their human capital, compensation, or reputation is tied to maintaining control or concealing decline (Jensen & Meckling, 1976; Daily et al., 2003). Effective governance constrains such behaviors and increases the likelihood that negative performance feedback results in timely adaptation rather than prolonged deterioration.

Thus, even among firms facing similar levels of underperformance and distress, those with stronger governance should be better positioned to mitigate bankruptcy risk.

Proposition 5: *Among firms performing below aspirations and approaching financial distress, stronger governance effectiveness is associated with lower bankruptcy risk.*

Top Management Turnaround Capacity and Bankruptcy-Risk Mitigation: Distress places exceptional demands on top managers. Leaders must diagnose causes of decline, prioritize actions under time pressure, negotiate with stakeholders, preserve morale, and execute difficult strategic and financial decisions. Top management turnaround capacity refers to the ability of the executive team to lead rapid stabilization and recovery under severe adversity (Barker & Mone, 1994; Lohrke, Bedeian, & Palmer, 2004).

Turnaround-capable leaders mitigate bankruptcy risk through several mechanisms. First, they improve diagnostic accuracy, distinguishing temporary shocks from structural decline and identifying the core drivers of distress. Second, they improve decision speed and prioritization, which is crucial because delay is often fatal in distress situations. Third, capable leaders can communicate credible recovery narratives to creditors, employees, customers, and investors, thereby preserving stakeholder support. Fourth, they are better able to orchestrate retrenchment, restructuring, and reconfiguration simultaneously without losing control of the organization.

The value of turnaround capacity is magnified when firms perform below aspirations and move close to bankruptcy because the organization's margin for error becomes extremely small. Under such conditions, even small improvements in diagnosis, sequencing, and implementation can determine whether the firm survives. Conversely, weak leadership can intensify confusion, stakeholder distrust, and operational paralysis.

Behavioral theory also suggests that top managers play a central role in interpreting performance feedback and directing attention (Ocasio, 1997). Thus, the survival consequences of aspiration shortfalls depend not only on external conditions but also on whether leaders can convert performance signals into coherent and effective action.

Proposition 6: *Among firms performing below aspirations and approaching financial distress, greater top management turnaround capacity is associated with lower bankruptcy risk.*

4. Discussion and Conclusion

4.1 Overall Discussion

This paper develops a theoretical framework explaining why some firms are able to mitigate bankruptcy risk when they perform below aspirations and move close to financial distress. Drawing on the Behavioral Theory of the Firm, organizational decline research, stakeholder theory, governance theory, and resource-based arguments, we propose that bankruptcy-risk mitigation depends on a set of survival-enabling conditions rather than on negative performance feedback alone. Specifically, we argue that firms below aspirations and nearing bankruptcy are more likely to avoid failure when they possess greater financial slack, more redeployable assets, stronger stakeholder support, stronger retrenchment capability, more effective governance, and greater top management turnaround capacity.

The central implication is that negative performance feedback does not deterministically produce bankruptcy. Instead, performance below aspirations activates urgency and the need for corrective action, but whether that urgency culminates in survival or failure depends on whether

the firm retains enough adaptive capacity to respond. This shifts the analytical focus from underperformance itself to the organizational conditions that allow firms to absorb, interpret, and counteract distress.

Our framework also refines the behavioral literature. Much prior work has emphasized that firms below aspirations engage in search, change, and sometimes greater risk-taking (Greve, 1998; Shinkle, 2012; Posen et al., 2018). That logic is valuable, but firms near bankruptcy operate under much harsher constraints. At that point, the question is not only whether firms search, but whether they can remain solvent and legitimate long enough for any search or restructuring to matter. In this sense, our model adds a survival lens to performance feedback theory.

Further, the paper highlights that bankruptcy is not merely an accounting event but an organizational process. Firms often fail not only because performance deteriorates, but because liquidity evaporates, assets are illiquid, stakeholders withdraw, boards fail to intervene, and leaders cannot coordinate a credible turnaround. By integrating these factors, we offer a more realistic and multi-dimensional explanation of bankruptcy-risk mitigation.

4.2 Theoretical Contributions

This study makes at least three major theoretical contributions. First, it extends the Behavioral Theory of the Firm by theorizing the conditions under which firms can **survive severe negative** performance feedback. BTOF has shown that aspiration shortfalls generate attention and search (Cyert & March, 1963; Greve, 2003), but it has not fully specified what allows firms to interrupt the progression from underperformance to failure under acute distress. We contribute by identifying the specific financial, organizational, governance, and leadership factors that help firms mitigate bankruptcy risk when negative feedback becomes existential.

Second, this study bridges the performance feedback literature with the organizational decline, turnaround, and bankruptcy literatures. Turnaround research has long emphasized retrenchment, leadership, and restructuring (Hofer, 1980; Pearce & Robbins, 1993; Trahms et al., 2013), while bankruptcy research has emphasized distress indicators, creditor relations, and failure prediction (Altman, 1968, 1984). Our paper connects these literatures by positioning negative performance feedback as the trigger and survival-enabling conditions as the mechanisms that determine whether firms arrest or amplify decline.

Third, we contribute a multi-factor, contingent framework of bankruptcy-risk mitigation. Rather than proposing a single dominant factor, we show that survival near bankruptcy depends on multiple interdependent conditions: time-buying resources, liquidity-generating assets, cooperative stakeholders, disciplined retrenchment, credible oversight, and capable leadership. This offers a richer theoretical basis for future empirical work.

A fourth contribution is implicit. The paper reframes organizational adaptation under distress as not merely a matter of strategic boldness or risk-taking, but of selective stabilization. In many cases, what saves firms is not greater experimentation but the preservation of solvency, legitimacy, and coordination. That insight may help explain why some firms recover through disciplined contraction and negotiated support rather than through aggressive strategic moves.

4.3 Limitations and Directions for Future Research

This paper is theoretical and therefore requires empirical validation. Future studies should test the proposed Propositions using panel data on distressed firms, ideally combining accounting-based distress indicators, aspiration-level measures, governance data, leadership variables, and information on stakeholder relationships or restructuring actions.

Second, the model focuses primarily on firms' historical aspirations. Future research may examine how social aspirations or peer-comparison benchmarks alter survival dynamics. A firm below its own past performance may behave differently from a firm below industry peers, even if both are distressed.

Third, we treat each factor as a distinct bankruptcy-risk mitigator, but future work should examine interactions among them. For example, financial slack may be more useful when governance is effective, and stakeholder support may depend partly on leadership credibility. Likewise, retrenchment capability may yield stronger survival benefits when asset redeployability is high.

Fourth, the framework would benefit from cross-national extension. Bankruptcy regimes, creditor rights, labor protections, ownership concentration, and state support differ substantially across institutional contexts (La Porta, Lopez-de-Silanes, Shleifer, & Vishny, 1998). These institutional differences likely shape how effectively firms can use slack, sell assets, negotiate with stakeholders, and restructure.

Fifth, future research may distinguish between temporary distress and deep structural decline. The same factors may not operate identically across these conditions. For example, slack may delay failure in structurally obsolete firms but enable genuine recovery in firms facing temporary shocks.

4.4 Implications for Practice and Policy

The framework offers several practical implications.

For managers, the paper suggests that reducing bankruptcy risk under underperformance is not solely about chasing growth or taking bold bets. It is also about preserving liquidity, protecting relationships, improving asset flexibility, and building the organizational capacity to contract intelligently when necessary. Managers should therefore treat slack, redeployable assets, stakeholder trust, and disciplined retrenchment capability as strategic insurance against distress.

For boards, the findings underscore the importance of timely intervention. Effective governance can reduce denial, escalation, and delay, all of which are especially dangerous near bankruptcy. Boards should monitor not only current performance but also liquidity resilience, strategic reversibility, and management's turnaround capability.

For creditors and investors, the framework highlights that distress should not be evaluated only through ratios. Whether a firm survives also depends on softer but critical conditions such as stakeholder support, leadership credibility, and the quality of retrenchment decisions. These factors can materially affect recovery prospects.

For policymakers, the study suggests that bankruptcy prevention and restructuring policy should not focus exclusively on legal insolvency procedures. Institutions that facilitate renegotiation, restructuring, temporary liquidity support, and orderly contraction may improve firm survival and reduce unnecessary liquidation, especially when firms remain economically viable but organizationally strained.

4.5 Conclusion

This paper develops a theory of bankruptcy-risk mitigation for firms performing below aspirations and approaching distress. We argue that underperformance alone does not determine bankruptcy. Rather, whether firms survive depends on whether they can mobilize a set of survival-enabling conditions: financial slack, redeployable assets, stakeholder support, retrenchment capability, governance effectiveness, and turnaround-capable leadership.

By shifting the focus from risk-taking under negative feedback to survival-preserving adaptation under severe distress, the paper extends the behavioral theory of the firm and connects

it to the turnaround and bankruptcy literatures. We hope this framework encourages future research on how firms interrupt the path from aspiration shortfalls to organizational failure.

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Policy Impact on Early-Stage Venture Capital Investment: A Difference-in-Difference Analysis

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ABSTRACT

This paper investigates whether government policy interventions increase early-stage venture capital (VC) investment. I use a difference-in-differences (DiD) design on 521 country-year observations of early-stage VC investment as a share of GDP across 30 countries from 2007 to 2024 to test whether such policies produce measurable effects in their targeted stage. The analysis identifies three significant treatment effects: Estonia (2008 and 2018) and Israel (2014). These effects correspond to key policy initiatives: the Estonian Development Fund, the Startup Estonia ecosystem, and the expansion of Israel's VC ecosystem programs.

Estimating treatment effects separately by investment stage shows that the Estonia (2008) intervention has effects concentrated entirely in seed and early-stage investment, with no detectable later-stage impact, as market failure theory predicts. By contrast, two cases that are significant for total VC in Sweden (2020) and the United States (2018) lose significance in the early-stage specification. This suggests their effects are concentrated in later-stage investment, representing market-cycle reallocation rather than policy-driven early-stage capital supply.

Robustness checks include placebo tests, randomization inference, and a Goodman-Bacon (2021) decomposition indicating substantial TWFE weight on forbidden comparisons. To address this, I employ synthetic difference-in-differences (Arkhangelsky et al., 2021), which confirms all three main effects. Additional checks include wild cluster bootstrap (Cameron et al., 2008), leave-one-out sensitivity, window-length variation, and Conley (1999) spatial HAC errors. The findings also hold when restricting controls to OECD, EU, and high-income subsets. Israel (2014) emerges as the finding with the strongest robustness profile.

All three significant cases involve multi-component policy packages combining direct investment vehicles, tax incentives, and ecosystem-building initiatives.

Future DiD research in Central Asian emerging economies may investigate how the Kazakhstani and Uzbekistani governments' venture initiatives, Astana Hub and Alem Ventures' Fund of Funds in Kazakhstan, and IT Park in Uzbekistan, affect early-stage investments in respective countries from 2026.

KEYWORDS: venture capital, early-stage investment, policy evaluation, difference-in-difference, startups, innovation policy, startup ecosystems, synthetic difference-in-differences

Rethinking Choice: Options that (Really) Matter in the Classroom

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Abstract

Student engagement in higher education is increasingly challenged by shifting cultural norms, digital behaviors, and the growing perception of education as a transactional, career-oriented investment. At the same time, students perceive themselves as consumers requiring greater personalization, flexibility, and autonomy in their learning experiences and outcomes. This creates a poignant tension between student expectations and the traditionally structured, regulated nature of higher education systems. This study explores the role of incorporating "choice" in higher education classrooms as a mechanism to address this problem and enhance student engagement, satisfaction, and performance. A systematic literature review, adhering to standard procedures and PRISMA protocols, was conducted to synthesize the extant literature on: (a) how choice is perceived or conceptualized by faculty and students; and (b) how choice is implemented in classroom settings. Findings indicate distinct differences in the meaning, type, and extent of choice based on student groups and contexts. Interestingly, choice is not celebrated by all students despite an increase in personalized learning pathways, flexible content engagement, and adaptive assessment. A number of factors, such as anxiety, inability to make decisions, and additional workload, impede both the adoption and effectiveness of pedagogical alternatives. The study provides an organizing framework for current approaches to choice, highlights critical boundary conditions that influence student acceptance, and provides a roadmap for future research.

Keywords: higher education, student choice, student autonomy, flexible learning, systematic literature review (SLR), PRISMA

From Cash to Code: A Theoretical Framework for the Programmable Transformation of Monetary Systems

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Abstract

This paper proposes a theoretical model of Central Bank Digital Currencies (CBDCs) as a fundamental shift from intermediated credit-based money to direct sovereign digital programmable assets. While traditional banking systems rely on a complex web of hierarchical ledgers and delayed settlement clearinghouses, the paper suggests a model of the CBDC as a unified, shared-ledger architecture that significantly shortens the distance between the central bank and the end-user.

The developed abstract model named the Frictionless Sovereign Layer (FSL) demonstrates how CBDCs provide superior utility over physical cash and commercial bank deposits through three primary mechanisms:

Atomic Settlement: The elimination of counterparty risk and settlement lag via real-time delivery-vs-payment (DvP) protocols.

Programmability: The integration of smart contracts directly into the monetary base, allowing for conditional payments and automated policy implementation.

Cost Elasticity: A reduction in the marginal cost of distribution compared to the high-maintenance infrastructure of physical currency and legacy electronic rails.

The theoretical analysis suggests that CBDCs redefine the "Moneyness" of digital assets by combining the safety of a central bank liability with the transactional velocity of decentralized finance (DeFi). One can argue that the transition from "Cash to Code" is a Pareto-improving evolution for financial stability, provided that the trade-offs between transactional privacy and systemic transparency are balanced through zero-knowledge proof architectures. The paper concludes that CBDCs represent an institutional "hard-fork" of the political economy, moving from a system of private intermediation to one of public, programmable infrastructure.

Keywords: Central Bank Digital Currency (CBDC), Smart Contracts, Financial Intermediation

JEL Classification Codes: E42, O33, L86

Discretionary Book-Tax Difference Smoothing and Firm Performance

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ABSTRACT

Firms employ a range of financial reporting and tax-planning techniques to manage the volatility of reported outcomes, including the smoothing of book–tax differences. Drawing on the approach that defines income smoothing as the managerial use of discretion to reduce volatility in reported outcomes over time, discretionary BTD smoothing can be understood as the deliberate use of accounting and tax choices to stabilize the gap between book income and taxable income across periods. The study further investigates how the relation varies across ownership structures.

Using fixed-effects regression models, the study presents evidence of a negative and statistically significant association between discretionary BTD smoothing and operating performance, consistent with the agency theory perspective. The results further indicate that certain ownership structure characteristics condition this relationship. In particular, for firms with owners involved in round-trip investment, discretionary smoothing is associated with stronger operating performance. This may reflect greater incentives and flexibility to use reporting discretion in ways that support operational efficiency rather than merely obscure performance, consistent with the efficient contracting perspective.

Overall, the results indicate that the performance implications of discretionary BTD smoothing are contingent on ownership structure. The findings highlight the importance of governance and ownership opacity in shaping the economic consequences of financial reporting discretion, contributing to the literature on tax avoidance, earnings management, and firm performance in emerging market contexts.

KEYWORDS: tax avoidance, book-tax differences, foreign ownership, round-trip investment

Navigating the Trilemma: Capacity, Cost, and Risk in Kazakhstan's Oil Export Routes to Europe

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This study presents a comprehensive assessment of the transport capacities, cost structures, and operational constraints shaping Kazakhstan's crude oil export routes to the European Union. The strategic importance of this analysis is rooted in Kazakhstan's emergence since 2022 as the EU's third-largest supplier of crude oil. This shift has placed a new focus on the resilience and reliability of Eurasian energy supply chains amid geopolitical realignments and evolving trade dynamics.

The research conducts a comparative evaluation of major high-volume pipeline systems, namely the Caspian Pipeline Consortium (CPC) and the Transneft network, against emerging multi-modal alternatives, with particular emphasis on the Trans-Caspian International Transport Route (TITR). Integrating quantitative transport data, tariffs, and logistical bottleneck assessments, the research identifies a fundamental transport trilemma: no single route currently offers a simultaneous balance of cost efficiency, scalable throughput capacity, and operational resilience.

Findings indicate that traditional pipeline corridors, while maintaining significant advantages in unit cost and volume handling, concentrate logistical risk, particularly through reliance on single transit jurisdictions and exposure to infrastructure vulnerability. Conversely, multi-modal alternatives, despite offering greater route diversification, introduce compounding complexities: trans-shipment dependencies, fragmented tariff structures, cross-border interoperability challenges, and intermodal bottlenecks that currently constrain their scalability and cost-competitiveness.

Geopolitical disruptions have sharpened the dimensions of this trilemma. The war in Ukraine has made the northern pipeline route via Russia (the Transneft system) unreliable politically and exposed it to sanctions-related problems, prompting Kazakh stakeholders to accelerate diversification toward the Trans-Caspian corridor. Simultaneously, instability in the Red Sea, (Houthi attacks on commercial shipping) has elevated maritime insurance premiums and rerouted tanker traffic, indirectly affecting the viability of export routes that rely on access to southern sea lanes and global chokepoints. Furthermore, the shadow of Iran war introduces additional layers of complexity. While Iran is not a transit country for Kazakhstan's oil exports, its proximity to the Trans-Caspian corridor creates additional risks.

These political pressures collectively reinforce the fragility of the current logistics architecture: pipeline-heavy routes face geopolitical exposure, while alternative corridors struggle to scale amid fragmented infrastructure and heightened security costs. The analysis therefore concludes that resolving the transport trilemma will require not only physical infrastructure investment but also strategic diplomatic engagement, risk-mitigation frameworks, and deeper integration of corridor governance to insulate Eurasian energy supply chains from compounding geopolitical shocks. It argues that building resilient freight flows between Kazakhstan and the EU will require strategic trade-offs and targeted investment to reconcile the competing dimensions of the transport trilemma.

Transforming Tomorrow: The Role of AI in Enhancing Accounting and Finance Education for Improved Learning Outcomes and Career Preparedness

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The integration of Artificial Intelligence (AI) in accounting and financial education represents a transformative change, reflecting broader trends in technological advancement within the financial sector. Increasingly, contemporary educational institutions are challenged to equip future professionals with the skills needed to thrive in an environment in which tools and systems enhanced by AI-XED are becoming essential to accounting practices and financial decision making. This need stems from the digitization of the accounting profession and the evolving scenario of financial services, which require not only technical proficiency, but also a different understanding of AI implications for financial analysis, risk management and compliance (Kokina & Davenport, 2017).

AI technologies, including machine learning, natural language processing, and robotic process automation, are remodeling traditional accounting and finance paradigms. These technologies can facilitate more efficient data analysis, improve decision -making processes and improve operational efficiency. Consequently, educational programs must adapt to incorporate these tools into their curricula to ensure that graduates have a competitive advantage in the job market. This is particularly crucial, as employers are increasingly seeking candidates who are not only qualified in traditional accounting and finance tasks, but they are also suitable for leveraging AI technologies to derive large data volumes and improve productivity (MARR, 2018).

The importance of this integration lies in its potential to significantly influence learning results. Research indicates that students who engage with IA -oriented educational tools tend to demonstrate enhanced analytical skills and a deeper understanding of complex financial concepts (Harlow et al., 2020).

In addition, AI integration in accounting and financial education is critical to promoting the development of skills that align themselves with the demands of contemporary employers. As IA continues to revolutionize financial industry, it is imperative that educational institutions not only transmit fundamental knowledge, but also cultivate skills in data analysis, critical thinking and ethical considerations around AI implantation (Seddigh & Hossain, 2021). Graduates should be prepared to navigate the complexities of AI in finance applications, including understanding how machine learning algorithms can affect investment strategies and risk assessment.

AI implications on future career availability are profound. Employers in accounting companies and financial institutions are recognizing that proficiency with AI tools is essential for effective decision making and strategic thinking (Davenport et al., 2020). Thus, a robust educational structure that emphasizes AI integration can improve the employability and adaptability of graduates in a rapid change market.

AI integration into accounting and financial education is not just an improvement of traditional pedagogical approaches; It is a necessary evolution that responds to the technological advances that reshaped the industry. By embracing the AI in educational contexts, institutions can significantly impact learning results, promote essential skill development, and ensure that students

are well prepared for the demands of their future careers in an increasingly automated financial scenario.

Keywords: Accounting and finance education; artificial intelligence; AI in educational contexts; AI in accounting; AI in finance education

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EARNINGS MANAGEMENT AND FIRM PERFORMANCE: EVIDENCE FROM KAZAKHSTAN

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Abstract

This research looks into the earnings management (EM) of 35 non-financial companies listed on the Kazakhstan Stock Exchange (KASE) from 2015 to 2024. The study also examines how EM relates to the financial performance of these companies. The Modified Jones Model was used to calculate discretionary accruals for earnings management. Financial performance was measured through return on assets (ROA). The main model used is Random-Effects regression with clustered standard errors. Feasible Generalized Least Squares regression (FGLS) was used for a robustness check and to correct for heteroskedasticity, autocorrelation, and cross-sectional dependence. The results showed that discretionary accruals positively affect ROA. Companies that use income-increasing earnings management techniques report better profitability. The study found that leverage acts as a performance reducer, while audit quality (Big4) shows a positive association with firm performance. However, size, liquidity, and age do not affect performance in any significant way. Earnings management appears to enhance reported performance in Kazakhstan with a low-transparent environment. This is consistent with Agency and Signaling explanations. However, this effect may reflect accounting adjustments rather than true economic performance. This research adds fresh insights to underexplored emerging markets. Moreover, the study recommends that authorities and policymakers monitor and track EM activities and develop better governance systems that help mitigate misleading financial records and restrict managers' discretion.

Keywords: Earnings management, Firm Performance, Kazakhstan

1. Introduction

The main purpose of financial reporting is to give a clear and honest picture of how a company is performing. In practice, this picture can sometimes be misleading. Several uncovered cases at Enron, WorldCom, Yukos, and Bank of Moscow demonstrated that it is relatively easy to manipulate numbers to reshape financial reporting when transparency is limited, and oversight and governance are weak. These examples make one thing clear: understanding earnings management and how it affects reported performance is especially important, particularly in markets where institutions are still developing, and outside information is not always easy to access. Information asymmetry appears to be higher than in developed countries, where managers have stronger incentives and more opportunities to influence reported earnings through discretionary accruals or real activities.

Earlier studies report mixed results. In some countries, earnings management appears to improve reported performance, while in others it has little or a negative impact. This demonstrates that the relationship is not the same in all countries and depends on the country's nature.

Kazakhstan is a country that can face particular challenges with earnings management practices. The public has limited access to information about companies. On the one hand, there could be strong incentives for managers to engage in earnings management. On the other hand, the

market could interpret financial performance in different ways. Still, there is little research on earnings management in Kazakhstan, and thus, it is unclear how earnings management and a firm's performance are connected in the non-financial sector for firms listed on KASE. Moreover, such firm characteristics as size, leverage, audit quality (Big4), liquidity, and age, and their effect on firms' performance have not been fully explored for the above-mentioned companies. The situation in Kazakhstan creates financial uncertainty, which affects all parties who need dependable financial data, including investors, regulators, and managers.

The motivation behind this research stems from its academic, real-world, and practical applications. Academically, earnings management in Central Asia and especially Kazakhstan has received very little attention. Because Kazakhstan operates in a very different institutional environment, it is unclear whether international findings apply here. The absence of evidence from Kazakhstan creates a clear gap that this study aims to address.

From a practical standpoint, the quality of financial reporting in Kazakhstan remains a concern even though IFRS was adopted in Kazakhstan and several regulatory reforms were implemented. Corporate ownership in Kazakhstan is often highly concentrated, when the state or a few large shareholders hold significant control. Such ownership structures can either reduce earnings management when it aligns managers with key shareholders or encourage earnings management when major owners place pressure on managers to meet performance expectations.

It is crucial for investors, authorities and policymakers and managers of the companies to understand and assess the relationship between EM and firm's financial performance. It then help to provide more reliable financial data, set strong standards, and improve transparency of the financial data to be used by investors when they make decisions.

This study is motivated by the need to provide evidence that can support better decision-making for all these groups.

- The Research Objectives are to assess the relationship between discretionary accruals (DA) and return on assets (ROA) of listed non-financial firms, to evaluate how leverage, firm size, age, and liquidity influence performance, and to contribute new evidence on earnings management and firm performance in an emerging market, specifically Kazakhstan.

This study is significant for several groups of users. This study gives a clearer view for investors on how earnings management can affect reported performance and help them judge companies more fairly. Also, the study shows regulators and policymakers where transparency and control can be improved to protect investors better. Moreover, for managers, the study explains how their financing choices can influence profitability.

This research also fills a gap in the literature on Kazakhstan and provides new evidence from this emerging market. It uses a unique panel dataset of non-financial firms listed on KASE from 2015–2024 and applies strong estimation methods to make the results trustworthy.

2. Literature review and hypotheses development

2.1 Theoretical Framework

Managers use different ways to adjust earnings so that financial statements look better thatn they really are. (Healy & Wahlen, 1999; Kothari *et al*., 2005). Such practices are often motivated by managerial incentives, market pressure, or contractual obligations. Different interconnected and complementary theories on EM attempt to explain why managers engage in these earnings manipulations and clarify how such management practices impact firm performance. In this study,

I employed two key theories —Agency Theory and Signaling Theory—to understand why managers engage in earnings management.

Agency Theory

Jensen and Meckling (1976) first proposed the concept of Agency theory. The theory explains the relationship between shareholders (the principals) and managers (the agents) in a company and says that managers are employed to act on behalf of the owners and to make decisions that serve the shareholders' best interests. However, managers possess more insider information about the firm's activities than shareholders, and this creates information asymmetry.

Earnings management is a typical example of agency conflict. Elghuweel *et al*. (2021) found that when managers use more discretionary accruals, firms tend to become less profitable, so managers pushed by personal or agency motives can harm a company's long-term performance.

The theory proposes that when managers are involved in opportunistic earnings manipulation to achieve personal objectives and when they present financial statements unrealistically, this decreases firm profitability and long-term performance. For instance, when managers' bonuses are linked to reported profits, managers have incentives to correct earnings so as to meet performance targets (Dechow *et al*. , 1995). These actions allow them to appear more successful in the short term, even if long-term firm performance suffers.

In Kazakhstan settings, these agency-related issues are critical. Concentrated ownership structures, in which the state or a small group of investors holds substantial control, can both limit and promote earnings management (EM). Moreover, as corporate governance and regulatory constraints in Kazakhstan are still developing, agency problems may persist, thus increasing the usage of EM practices. When transparency is low or obscure, and when audit quality is sometimes of poor quality or inconsistent, and when board independence makes monitoring mechanisms weak, it thus encourages managers' opportunistic exploitation. Thus, income manipulation might remain relatively high among firms listed on KASE.

Agency Theory supplies a robust base for explaining why earnings management occurs.

Overall, Agency Theory predicts a negative association between EM and firm performance. Usually, good governance, transparency, and strong regulations help limit managers' opportunistic behaviour and improve a company's value.

Signalling Theory

- Spence (1973) developed Signalling Theory. According to this theory, managers use private information to signal good performance and the firm's quality to investors. Managers have more information about the firm´s actual performance, prospects, and risks than investors and creditors. Thus, information asymmetry naturally exists. To reduce this gap, managers may send signals to decrease information asymmetry, by making voluntary disclosures.
- Previous research shows that managers use earnings management as a signal to investors and the market, communicating information about their company's performance. Graham *et al*. (2005) say that managers smooth earnings on purpose because they believe that investors prefer companies with predictable performance. Tucker and Zarowin (2006) found that investors perceive companies with smoother earnings as easier to understand. Healy and Palepu (2001) point out that when investors have few reliable sources of information, they pay much closer attention to the earnings that managers report. Because of this, steady and predictable earnings can make a company look more reliable and easier for investors to understand.
- In Kazakhstan, the market still has limited transparency. As a result, investors pay close attention to the earnings companies report. When managers smooth out big ups and downs in earnings, investors often take the steady numbers as a sign that the company is stable and

being run responsibly. Investors see the smoother numbers as a sign that the company is steady and being run sensibly.

2.2 Empirical Review

- *Evidence from Developed Markets Studies*
- Research conducted in developed economies demonstrates that earnings management practices lead to negative impacts on firm performance. Euro-Continental firms experience decreased profitability when their discretionary accruals reach high levels (Ben Amar and Chakroun, 2019). These results are in line with Agency Theory saying that when managers use earnings manipulation it damages reporting quality and creates information gaps and negatively impacts long-term organizational success.
- *Evidence from Emerging Markets Studies*

Research conducted in emerging markets shows that earnings management produces mixed effects on corporate performance. The majority of research findings indicate a negative correlation exists between these two variables. Research conducted in Palestine and Pakistan demonstrates that higher discretionary accruals lead to decreased profitability and lower earnings quality (Abu Alrob, 2025; Khan, 2022) in emerging markets of Palestine and Pakistan.

Research by Egbadju (2021) demonstrates mixed results based on different EM model applications because some models indicate ROA improvement. The research by Odusina *et al*. (2021) demonstrates that EM leads to better performance results for insurance companies through specific performance metrics. These findings indicate that weak investor protection and large information asymmetry may influence the perception of business performance through earnings management. Overall, research conducted in emerging markets shows that EM-performance relationships differ significantly based on institutional frameworks.

Evidence from CIS Countries Studies

The current research on EM in Kazakhstan is limited. The research by Park and Nauruzbayev (2019) examines how ownership structure, company size, leverage, and state ownership influence EM practices. The study reveals that managers use accrual-based methods to manipulate financial reports. Faizulayev *et el.* (2022) say in research about the Russian extractive industry EM that ownership concentration and agency incentives drive EM practices in post-Soviet corporate environments. This confirms that EM exists in CIS countries and underscores the need to explore its performance in Kazakhstan.

2.3 Hypotheses Development

Research findings on earnings management and firm performance have shown mixed results with both positive and negative effects of earnings management (EM) on ROA. These results align with Agency Theory and Signaling Theory. The current lack of research on Kazakhstan and inconsistent results from other countries make it difficult to determine how discretionary accruals affect corporate performance in the Kazakhstani market.

This study develops the following hypotheses:

2.3.1 Earnings management and firm performance

It is known that earnings management can significantly influence corporate performance. Thus, the following hypothesis is constructed:

H1: EM, measured through discretionary accruals (DA), has a significant effect on financial performance (ROA).

2.3.2 Firm size and firm performance

Larger firms typically benefit from economies of scale, better access to financing, and more diversified operations, which may positively influence profitability. Thus, the following hypothesis is developed:

H2: Firm size positively affects financial performance (ROA).

2.3.3 Leverage and firm performance

Higher leverage increases financial risk and interest obligations, which can negatively affect firm profitability. Thus, the following hypothesis is developed:

H3: Leverage negatively affects financial performance (ROA).

2.3.4 Audit quality and firm performance

Prior literature suggests that firms audited by Big4 auditors benefit from higher audit quality, enhanced credibility of financial statements, and improved investor confidence, which may positively affect firm performance. Big4 auditors are generally associated with stricter auditing standards and higher reporting transparency, which may contribute to improved financial outcomes. Thus, the following hypothesis is constructed:

H4: Firms audited by Big4 audit firms exhibit higher financial performance (ROA).

2.3.5 Liquidity and firm performance

Firms with higher liquidity are better able to meet short-term obligations and operate more efficiently, which may positively affect financial performance. Thus, the following hypothesis is developed:

H5: Liquidity positively affects financial performance (ROA).

2.3.6 Firm age and firm performance

Older firms may benefit from greater experience, established market positions, and more stable operations, which can positively influence performance. However, older firms may also be less flexible and slower to respond to changes. Thus, the following hypothesis is developed:

H6: Firm age positively affects financial performance (ROA).

The study uses these hypotheses to test how earnings management, audit quality (Big4), and key firm characteristics relate to profitability within Kazakhstan's non-financial sector.

3. Data and Methodology

3.2 Research Design

This research follows a quantitative panel-data regression, using financial information for listed non-financial firms over a ten-year period. The empirical analysis was conducted in Stata. The research investigates earnings management and firm performance in Kazakhstan's non-financial sector. The Modified Jones Model enables the determination of discretionary accruals while ROA serves as the performance metric for firms.

3.3 Sample and Data Description

The initial population included 68 companies listed on KASE with the annual financial statements available in Refinitiv Eikon for the period from 2015 to 2024. 22 financial and banking sector companies were excluded because they do not have the variable to calculate accruals, have different accounting specifications, industry characteristics, and regulations. The population was further cleaned of companies that are not operating or were missing financial statements. These eliminations resulted in the list of 35 non-financial companies. The dataset initially consisted of 350 firm-year observations for the period 2015-2024; however, due to missing data, the effective sample is reduced to 340 observations. Some variables, particularly PPE, exhibit missing values, which reduced the effective sample size for accrual-based estimations.

Financial institutions, including leasing companies, were excluded from the sample because these entities have a fundamentally different financial structure compared to non-financial firms, as their assets primarily consist of financial instruments rather than tangible fixed assets.

Since the Modified Jones Model relies on property, plant, and equipment (PPE) and accrual-based accounting relationships typical for industrial firms, its application to financial institutions would lead to biased and unreliable estimates of discretionary accruals. Therefore, to ensure the validity and comparability of results, only non-financial companies were included in the final sample.

3.4 Variable Definitions and Measurement

The variables included in the empirical model are summarized in the table below.

Table 3.3. Description and Measurement of Variables

Variable	Variable Type	Description	Measurement
ROA	Dependent	Firm performance	Net Income / Total Assets
DA	Independent	Discretionary Accruals	Modified Jones Model residual
Size	Control	Firm size	ln(Total Assets)
Leverage	Control	Financial leverage	Total Debt / Total Assets
Big4	Governance	Audit Quality	Dummy variable (1 = Big4 auditor, 0 = otherwise)
Liquidity	Control	Short-term financial health	Current Assets / Current Liabilities
Age	Control	Firm age	Years since incorporation

3.5 Research Model

The relationship between earnings management and financial performance is estimated using the following baseline panel regression model:

$$ROA_{it} = \beta_0 + \beta_1 DA_{it} + \beta_2 Size_{it} + \beta_3 Leverage_{it} + \beta_4 Big4_{it} + \beta_5 Liquidity_{it} + \beta_6 Age_{it} + \gamma_t + u_i + \varepsilon_{it}$$

Where:

- ROA_{it} represents firm performance of firm *i* in year *t*,
- DA_{it} represents discretionary accruals (earnings management),
- $Size_{it}$ represents firm size,
- $Leverage_{it}$ represents financial leverage,
- $Big4_{it}$ represents audit quality (dummy variable equal to 1 if the firm is audited by a Big4 auditor, and 0 otherwise),
- $Liquidity_{it}$ represents liquidity,
- Age_{it} represents firm age,
- γ_t represents year fixed effects (time dummies),
- u_i represents unobserved firm-specific effects,
- *i* represents firm,
- *t* represents year,
- β_0 represents a constant term/intercept,
- β_1 - β_6 represent coefficients for each independent variable,
- ε_{it} is the error term.

3.6 Model Selection: Fixed Effects vs. Random Effects

To determine whether the Fixed Effects (FE) or Random Effects (RE) estimator is more appropriate, the Hausman test was applied.

Table 3.5. Hausman Test (FE vs RE)

Test	chi2	p-value	Decision
Hausman Test (FE vs RE)	3.17	0.7866	RE preferred (fail to reject H_0)

Random Effects model is selected as the primary estimation method for the analysis.

3.7 Diagnostic Tests

Diagnostic tests for multicollinearity, heteroskedasticity, autocorrelation, cross-sectional dependence (CSD), and stationarity were conducted before estimating the panel regression model. These tests helped determine the most appropriate model specification.

The FGLS method served as a robustness check to handle the diagnostic test issues, which included heteroskedasticity, autocorrelation, and cross-sectional dependence. The combination of these methods enables the evaluation of the relationship between earnings management, firm characteristics, and profitability.

4. Results and Interpretation of Findings

4.2 Sample Structure

Table 4.1 summarizes the final sample structure.

Table 4.1. Sample Structure and Data Overview

Category	Description / Count
Initial population (KASE-listed companies with data available in Refinitiv)	68 firms
Excluded financial & banking firms	22 firms
Excluded non-operating & insufficient-data firms	11 firms
Final sample (non-financial firms)	35 firms
Study period	2015–2024
Total firm-year observations (unbalanced panel)	340
Valid discretionary accruals (DA) available	129
Final regression sample (after listwise deletion)	112
Panel type	Unbalanced panel
Sectors included	6

Because several firms did not have all the necessary accounting data, and due to data availability constraints, some variables contain missing observations. Consequently, not all the discretionary accruals for each year were computed, and the regression analysis is conducted on an unbalanced panel dataset. The final sample covers six economic sectors, namely Basic Materials, Consumer Non-Cyclicals, Energy, Industrials, Technology, and Utilities

4.3 Descriptive Statistics

Table 4.2 summarises the central tendencies and variability of the key variables.

Table 4.2. Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
ROA	340	0.0499	0.1547	-0.7158	0.6533
DA	129	-0.0000	0.1425	-0.5914	0.3853
Size	340	24.9743	2.1542	18.9279	30.5720
Leverage	323	0.3449	0.3482	0.0000	2.0300
Big4	340	0.2313	0.4220	0	1
Liquidity	330	2.1044	4.7642	0.0219	79.6325
Age	340	21.3029	18.1860	0	111

The mean ROA is approximately 5% with a standard deviation of 0.155. This indicates considerable variability in the profitability of the non-financial companies across Kazakhstan. The minimum ROA of –0.72 and the maximum of 0.65 illustrate substantial variation in firm performance, which is typical in emerging markets with heterogeneous industry structures and volatile operating environments.

Discretionary accruals (DA), which are used as a proxy for earnings management, have a mean close to zero and a standard deviation of 0.143, which is consistent with prior studies employing the Modified Jones Model and suggests that the magnitude of abnormal accruals varies meaningfully across firms.

Firm size (measured as the natural logarithm of total assets) ranges from 18.93 to 30.57, suggesting a mix of medium and large firms in the sample.

The Big4 variable shows that approximately 23% of firm-year observations are audited by Big4 audit firms, indicating that the majority of firms rely on non-Big4 auditors.

Most independent variables exhibit considerable variability, namely leverage, liquidity, and firm age, which show wide dispersion across firms. The average firm age is approximately 21 years, ranging from newly incorporated firms to long-established entities over 100 years old.

4.4 Correlation results

Table 4.3 shows correlations among all variables

Table 4.3. Correlation Matrix

Variable	ROA	DA	Size	Leverage	Big4	Liquidity	Age
ROA	1						
DA	0.233***	1					
Size	0.295***	-0.004	1				
Leverage	-0.484***	0.011	-0.296***	1			
Big4	0.371***	0.033	0.538***	-0.137***	1		
Liquidity	0.103*	0.145	-0.015	-0.190***	-0.023	1	
Age	0.096*	0.156*	0.119**	-0.187***	0.222	0.177***	1

Note. * p < .10, ** p < .05, *** p < .01

The correlation matrix shows that ROA is significantly positively associated with DA (r = 0.233, p < .01) and firm size (r = 0.295, p < .01), indicating that larger firms and firms with higher discretionary accruals tend to have higher profitability. Big4 shows a positive correlation with ROA (r = 0.371, p < .01), suggesting that firms audited by higher-quality auditors tend to report better financial performance. ROA is strongly negatively correlated with leverage (r = -0.484, p < .01), suggesting that higher debt levels are associated with lower performance. Liquidity exhibits a weak positive correlation with ROA (r = 0.103, p < .10). Age also shows a weak positive relation with profitability (r = 0.096, p < .10). Correlations among independent variables are generally low, with the highest being size and Big4 (r = 0.538, p < .01), indicating that multicollinearity is not a concern.

4.5 Diagnostic Tests

Before estimating the regression models, diagnostic tests were conducted to verify key panel-data assumptions. These tests assess whether issues such as heteroskedasticity, autocorrelation, or cross-sectional dependence are present and whether corrections are needed.

Table 4.4. Summary of Diagnostic Test Results

Diagnostic Test	**Purpose**	**Statistic / Result**	**p-value**	**Conclusion, Correction**
Hausman Test	Model selection	chi² (6)= 3.17	0.7866	Random Effects preferred, RE + clustered SE
Variance Inflation Factors (VIF)	Multicollinearity	VIF range = 1.04–1.52	—	No multicollinearity detected, no correction needed
Modified Wald Test	Heteroskedasticity	chi²(19) = 12521.76	0.000	Heteroskedasticity present, Clustered SE; FGLS,
Wooldridge Test	Autocorrelation	F(1,14) = 4.211	0.0593	Weak/borderline, Clustered SE; FGLS
Pesaran CD Test	Cross-sectional dependence	CD = 1.015	0.310	No CSD detected, no correction needed
Fisher ADF (ROA)	Stationarity	All statistics significant	0.000	ROA is stationary, no correction needed
Fisher ADF (DA)	Stationarity	Test could not run due to gaps	—	Assumed stationary (residual-based measure)
Durbin–Wu–Hausman Test	Endogeneity (DA)	chi²(1) = 1.28/ F(1,83)=1.18	0.258 / 0.280	No endogeneity detected → RE model appropriate

There is no evidence of multicollinearity, as VIF values are low. However, there is heteroskedasticity present, while there is weak evidence of autocorrelation. There is no evidence of cross-sectional dependence. Stationarity tests confirm that the main variables, including ROA, leverage, and liquidity, are stationary, although discretionary accruals (DA) could not be tested due to missing observations. DA is a residual-based variable from the Modified Jones model and

contains missing values, which prevents panel unit root testing. Additionally, endogeneity tests based on the Durbin and Wu–Hausman statistics indicate that discretionary accruals are exogenous, supporting the validity of the baseline Random-Effects specification. The Hausman test supports the use of the random-effects model. Therefore, the study employs random-effects regression with clustered standard errors, and robustness checks are conducted using FGLS estimators to address issues with heteroskedasticity and weak autocorrelation and to ensure that empirical findings are statistically reliable and valid.

4.6 Model Selection

In order to determine whether the Fixed Effects or Randon Effects regression should be used, the Hausman Test was performed. The Hausman test was not statistically significant with a p-value of 0.7866; therefore, the RE model estimator was used.

FGLS is then used to address heteroskedasticity and autocorrelation, which were identified in the diagnostic tests.

4.7 Regression Results

This section presents the main empirical results examining the relationship between discretionary accruals (DA) and firm performance (ROA). The Random-Effects model with clustered standard errors is used as the main estimator based on the Hausman test. Feasible Generalized Least Squares (FGLS) is included as a robustness check to account for heteroskedasticity and autocorrelation.

4.7.1 Random-Effects Regression Results (Clustered Standard Errors) Main Model

Table 4.6.1 presents Random-Effects Regression Results (Clustered SE)

Table 4.6.1. Random-Effects Regression Results (Clustered SE)

Variable	Coefficient	Std. Error	p-value
DA	0.4639**	0.1912	0.015
Size	0.0005	0.0164	0.978
Leverage	-0.1797***	0.0270	0.000
Big4	0.0978**	0.0491	0.047
Liquidity	-0.0009***	0.0003	0.002
Age	-0.0001	0.0005	0.865
_cons	0.0388	0.4391	0.930

Model Fit and Tests

- Wald chi2(6) = 144.93, p = 0.0000 (model is jointly significant)
- Number of observations = 112
- Number of groups (firms) = 19
- R^2 (overall) = 0.3390

In this study, the Random-Effects model with clustered standard errors shows that discretionary accruals (DA) have a positive and statistically significant effect on financial performance, measured by ROA, at the 5% significance level ($\beta = 0.4639$, $p = 0.015$). This means that firms engaging in higher levels of earnings management report better accounting performance, which may reflect reporting practices rather than underlying economic improvements.

Leverage is negative and highly significant ($\beta = -0.1797$, $p < 0.001$), indicating that more leveraged firms perform worse.

Audit quality, measured by Big4, has a positive and statistically significant effect (β = 0.0978, p = 0.047), suggesting that firms audited by Big4 auditors tend to perform better, meaning that higher audit quality enhances reporting credibility and may constrain opportunistic earnings management and lead to more reliable performance

Liquidity shows a negative and statistically significant effect (β = -0.0009, p = 0.002), indicating that higher liquidity may be associated with lower efficiency in asset utilization.

Size and age do not show statistically significant effects on ROA.

4.7.2 Feasible Generalized Least Squares (FGLS – Robustness Check Model)

The FGLS estimator was applied as an additional robustness check because it can correct for heteroskedasticity across firms and autocorrelation within panels. Year dummy variables were included to control for macroeconomic shocks and common time effects, as FGLS does not automatically capture these. Year fixed effects were included but omitted from the table for brevity.

Table 4.6.2. presents FGLS Regression Results.

Table 4.6.2. FGLS Regression Results (Year Dummies Included)

Variable	Coefficient	Std. Error	p-value
DA	0.3652***	0.0653	0.000
Size	-0.0053	0.0043	0.219
Leverage	-0.1224**	0.0441	0.005
Big4	0.1438***	0.0196	0.000
Liquidity	-0.00058	0.00049	0.238
Age	-0.0004	0.00044	0.930
_cons	0.1117	0.1097	0.309

Model Diagnostics:

- Wald chi2(14) = 135.48, p = 0.0000 (model is jointly significant)
- Number of observations = 109
- Number of groups = 16

The FGLS results remain consistent with the Random-Effects model, supporting the robustness of the main findings. Discretionary accruals (DA) maintain a positive and highly significant effect on firm profitability (β = 0.3652, p < 0.01). This indicates that firms engaging in higher levels of earnings management tend to report stronger financial performance, consistent with the earlier model specifications.

Leverage also remains negative and strongly significant (β = −0.1224, p < 0.01), confirming that more indebted firms systematically experience lower profitability.

Liquidity is found to have a negative and statistically significant effect in the baseline model; however, it becomes statistically insignificant in the FGLS specification. This suggests that the effect of liquidity on firm performance is not robust across estimation methods and should therefore be interpreted with caution.

However, size and firm age remain statistically insignificant, as in the previous models.

Importantly, audit quality (Big4) remains positive and highly statistically significant in the FGLS model (β = 0.1438, p < 0.01). This reinforces the evidence that firms audited by Big4 auditors tend to exhibit higher financial performance, supporting the argument that higher audit quality enhances credibility and investor confidence.

Overall, the FGLS results reinforce the findings from the primary model (RE with clustered SE). The consistency of sign and significance across all estimation techniques strengthens confidence in the conclusion that discretionary accruals positively affect firm performance, while leverage reduces it.

Overall, the regression results indicate that while discretionary accrual-based earnings management is an important determinant of reported profitability, leverage actually acts as a significant constraint on financial performance. These findings form the basis for the interpretation and contextual analysis presented in the following section.

4.8 Summary of Discussion

Overall, the findings of this study show that only three factors—earnings management (DA), leverage, and audit quality (Big4)—play a consistent and meaningful role in explaining firm performance among Kazakhstan's listed non-financial firms. Discretionary accruals are positively associated with ROA across all models, suggesting that managers may be using earnings adjustments to present smoother or stronger performance, which aligns with both Agency Theory and Signaling Theory. These findings are also consistent with Zhang and Ayisi (2020), who documented a positive influence of earnings management on profitability.

Audit quality, proxied by the Big4 variable, also shows a positive and statistically significant effect on firm performance across models, suggesting that firms audited by high-quality auditors benefit from greater reporting credibility and improved financial outcomes. This finding is consistent with prior research by Yasmin *et al*. (2024), who find that higher audit quality enhances financial reporting reliability and reduces earnings manipulation, thereby supporting overall firm performance.

In contrast, leverage, on the other hand, shows a stable and negative effect on profitability, reflecting Kazakhstan's high borrowing costs, financial constraints, and economic volatility. This aligns with Chen (2001), who says that higher leverage is associated with significantly lower financial performance (ROA), especially in smaller firms and high-risk business environments.

The other firm characteristics—size, liquidity, and age—do not consistently explain performance, indicating that these basic attributes are less influential than reporting choices and financial structure. The findings also highlight how Kazakhstan's institutional environment—concentrated ownership, uneven audit quality, limited transparency, and sectoral volatility—shapes the way earnings management and financial performance interact.

Taken together, the discussion shows that earnings management in Kazakhstan serves both opportunistic (agency-driven) and informational (signaling-driven) purposes, and that leverage remains a key constraint on firm profitability.

5. Conclusions and recommendations

The main goal of this research was to understand how earnings management, measured through discretionary accruals using the Modified Jones Model, relates to the financial performance of non-financial firms listed on the Kazakhstan Stock Exchange. The study also examined whether size, leverage, audit quality, liquidity, and firm age play a role in explaining profitability.

To do this, the study used an unbalanced panel of 35 companies over the period 2015–2024. For the main analysis, a Random-Effects regression with clustered standard errors was used. Running a robustness check FGLS model also helped deal with issues like heteroskedasticity and

autocorrelation. The diagnostic tests showed that these methods worked well with the data, and the results stayed consistent across the different models.

Summary of Key Findings

The findings of this study show that three factors—earnings management, leverage, and audit quality (Big4)—play a consistent and meaningful role in explaining the financial performance of non-financial firms listed on the Kazakhstan Stock Exchange.

The positive and statistically significant relationship between DA and ROA across all models indicates that some firms may be using earnings management to present better and stronger impressions of their performance. It is important to note that the positive relationship between discretionary accruals and ROA reflects reported accounting performance and may not necessarily indicate improvements in firms' underlying economic performance. This result can be interpreted through both Agency Theory and Signaling Theory. Managers often know more about the firm's real situation than outside investors. They tend to adjust earnings to make the company's financial reporting appealing to external users and to influence external perception. At the same time, from the agency perspective, managers might be trying to show the market that the firm is stable and performing well, especially in an environment where information is limited and when characterized by information asymmetry.

Leverage was the most consistent and strongest negative predictor of performance. Highly indebted companies showed worse results in every model and systematically exhibit lower performance. This is in line with Kazakhstan's business environment, where the cost of debt is high, there are also unstable economic conditions, but still firms still rely on bank financing. Under these circumstances, high debt levels lower profitability.

Audit quality, proxied by Big4 variable, show a positive and statistically significant effect on firm performance. This suggests that firms audited by high-quality auditor benefit from enhanced credibility of financial reporting and improved financial outcomes.

In contrast, firm size, liquidity, and age do not demonstrate consistent or statistically significant effects on performance across models. This could indicate that structural characteristics of firms are less influential than financial decisions and reporting practices.

Overall, the results show that what really drives firm performance in Kazakhstan is how earnings are handled and how much debt the company decides to take on. These two areas seem to matter more than the basic characteristics of a firm. This highlights why transparency in financial reporting and careful financing decisions are so important. It also shows that investors, regulators, and even the firms themselves should look beyond the headline numbers and pay attention to the practices and financial choices that shape those results.

Policy, Managerial, and Academic Implications

The findings of this study have several important implications for firms, policymakers, investors, and the academic community, including researchers.

The positive connection between discretionary accruals and reported performance suggests that firms may have incentives to use earnings management to influence how their financial results and performance are reported. This has direct implications for regulators, policymakers, and standard-setters in Kazakhstan. Improving disclosure practices, increasing transparency, and paying attention to unusual accruals could go a long way in making financial reporting more reliable. This is especially important in a market where investors do not always have full information and external monitoring is limited. Stronger reporting standards and consistent enforcement would help limit opportunistic behavior and provide investors with clearer, more reliable financial information.

For managers, the findings show that it is essential to make careful financial decisions, especially when deciding how much debt the firm takes on. Firms may benefit from adopting a more balanced, conservative approach to borrowing, as it can help avoid negative effects on performance and strengthen performance. Managers should also remember that, even though earnings management can make numbers look better in the short term, it can later create problems if lenders or shareholders expect results the firm cannot sustain. Moreover, maintaining a balanced capital structure is essential to avoid the negative effects of high debt on profitability.

For investors and analysts, the results highlight the need to see behind the basic earnings reported figures. Because profitability can be shaped by earnings management and the firm's level of leverage, investors in Kazakhstan should pay close attention to the notes in the financial statements, review accrual trends, and firms' leverage ratios before making decisions.

From an academic perspective, this research contributes to the emerging-market literature by focusing on Kazakhstan, where earnings management has not been examined closely. The results contribute to the mixed findings in international studies by showing that the DA–ROA relationship can depend heavily on the local environment. They also support both Agency and Signaling theory in an environment where transparency is low and information is uneven.

Limitations

Although the study provides useful insights, several limitations should be noted, and could offer new potential focuses for future studies.

First, the dataset was unbalanced because many firms' data were not available in Refinitiv for every year. Some key variables needed for calculating discretionary accruals—such as PPE, receivables, and changes in working capital items—were missing in several cases. Because DA cannot be calculated without these inputs, the number of available observations was smaller than the full sample.

Second, the study focuses only on listed non-financial firms in Kazakhstan. Because financial institutions and private companies face different regulations and operate differently, the findings may not fully apply to them.

Third, the study looks only at accrual-based earnings management and therefore does not capture real actions like changing production, sales timing, or discretionary costs. Including these alternative measures could provide a more complete picture of earnings management practices.

Fourth, the study focuses only on Kazakhstan. It would be helpful to examine other CIS countries and emerging markets to determine whether these results are unique to Kazakhstan or common elsewhere.

Finally, the model only explains 28% of ROA. Other factors (governance, competition, etc.) may also matter and influence firm performance, but were not fully incorporated and included.

Recommendations for Future Research

Despite the limitations discussed above, there are several directions in which future studies could expand on my work.

The first challenge I ran into was missing data. Some of the required information was not available in Refinitiv, which meant I couldn't calculate discretionary accruals for every firm-year, especially items like PPE, receivables, and changes in working capital. Because of this, the number of observations used was smaller than the full dataset. Future studies could try to collect this information directly from annual reports or other company filings. This will allow future researchers to perform a more complete and accurate analysis.

Another area that could be used for future studies is the use of real earnings management. This study only examined accrual-based earnings management. On the other hand, managers can also influence earnings through real activities, such as changing production, shifting sales from period to period, or adjusting discretionary accruals. Adding both types of earnings management could give a more complete picture of how firms manage their reported performance.

It may also be helpful to look at corporate governance factors. Elements such as board independence, key management personnel compensation, and ownership structure might help to explain why some firms engage more in earnings management than others. As long as governance practices vary across Kazakhstani firms, this could add valuable insight.

Another useful direction for future research is to include additional variables that may explain firm performance more fully. In this study, the model explained about 28% of the variation in ROA, which is normal for firm-level data. However, it also shows that there are other factors—such as governance quality, ownership concentration, market competition, or audit effectiveness—that could influence profitability but were not included here. Adding these types of variables in future studies could help provide a deeper understanding of what drives firm performance in Kazakhstan.

Also, to make the model more fitted, it will be beneficial to add more economic and market variables to capture a broader set of performance drivers.

One more useful direction would be comparing Kazakhstan with other CIS countries or emerging markets.

Finally, future research could examine how firms behave during major economic or political events, such as the COVID-19 pandemic or oil price swings. These kinds of shocks may influence how managers report earnings. Understanding this could give a clear picture of why earnings management increases in certain periods.

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Can Digitalization Overcome Landlocked Constraints? Regional Competitiveness and Sustainable Development in Central Asia

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ABSTRACT

This paper examines whether digitalization can help Central Asia overcome the developmental penalties of landlockedness. Central Asia has long faced structural disadvantages associated with landlockedness, including high transport costs, dependence on external corridors, fragmented market access, and exposure to border-related delays. These constraints have historically limited the region's ability to integrate efficiently into global trade and investment networks. Digitalization has also become a regional policy priority. Initiatives such as the CAREC Digital Strategy 2030 and ESCAP's discussions of "Central Asia-as-a-Platform" reflect a growing view that digital cooperation can improve connectivity, strengthen governance, and support more competitive and inclusive development across the region (CAREC Secretariat, 2022; Tazhiyev, 2021).

In the Central Asian context, these frictions include administrative inefficiency, information asymmetry, and cross-border procedural fragmentation. The paper identifies four channels through which digitalization can reshape regional competitiveness: digital trade facilitation, logistics and corridor efficiency, digital public governance, and expanded market access and innovation diffusion.

However, the benefits of digitalization are neither automatic nor evenly distributed. Their realization depends on complementary conditions, especially institutional quality, digital infrastructure, human capital, and regional cooperation. Where these conditions are weak, digital adoption may remain shallow or concentrated in already advantaged urban nodes, producing uneven territorial outcomes rather than broad-based development. Sustainable value creation in the digital era requires not only technological adoption, but also the institutional and cooperative capacity to convert connectivity into long-term competitiveness, resilience, and inclusion.

KEYWORDS: digitalization; landlockedness; regional competitiveness; sustainable development; Central Asia; connectivity

1. INTRODUCTION

Central Asia is one of the clearest regional cases in which geography continues to shape economic development. Its landlocked position has historically generated high transit costs, dependence on external routes, limited direct maritime access, and vulnerability to border frictions. As digital systems increasingly shape the movement of information, services, goods, and administrative processes, digitalization has become a potentially important mechanism for easing some of the economic penalties associated with landlockedness.

This question is especially relevant in Central Asia, where digitalization is increasingly framed as a development strategy. The CAREC Digital Strategy 2030 explicitly links digital transformation to competitiveness, inclusion, and improved regional cooperation, while ESCAP's "Central Asia-as-a-Platform" approach highlights the role of digital solutions in building a more

connected and sustainable regional economy. Recent OECD work on the Trans-Caspian corridor similarly stresses that transport competitiveness depends not only on physical infrastructure, but also on digital processes, trade facilitation, and improved coordination (OECD, 2025).

This paper argues that digitalization does not remove geography, but it can reduce the frictions through which geography constrains development. By lowering these frictions, digitalization can strengthen regional competitiveness and support more sustainable development. However, its effects are conditional rather than automatic.

2. LITERATURE REVIEW AND ANALYTICAL PERSPECTIVE

The literature on landlocked development has traditionally emphasized the burdens imposed by physical remoteness, high transport costs, and dependence on transit neighbors. More recent work, however, suggests that the disadvantages of landlockedness are not purely geographical. They are also institutional and organizational, reflecting the quality of customs procedures, logistics systems, cross-border governance, and information coordination (OECD, 2025). This broader interpretation is particularly useful for Central Asia, where trade and corridor performance depend heavily on administrative interoperability and regional cooperation.

The literature on digitalization, by contrast, highlights the ability of digital technologies to improve information flows, reduce transaction costs, support market access, and enhance public-sector efficiency (Belacin et al., 2025; CAREC Secretariat, 2022). It can also contribute to sustainable development by increasing efficiency, strengthening resilience, and broadening access to economic opportunities.

This paper brings these two strands together through a simple analytical proposition: digitalization does not abolish geography, but it can reduce the economic frictions through which geography constrains development. In Central Asia, these frictions are especially visible in border administration, corridor coordination, logistics management, and the limited reach of local firms into regional and global markets.

3. HOW DIGITALIZATION CAN MITIGATE LANDLOCKED CONSTRAINTS

Digitalization can mitigate landlocked constraints through four main channels. First, it can improve trade facilitation. Electronic customs systems, digital documentation, and single-window platforms can reduce clearance times, improve transparency, and lower procedural uncertainty (OECD, 2025).

Digitalization can enhance logistics and corridor efficiency. Real-time tracking, integrated freight coordination, and data-based transport management can improve the predictability and reliability of transit routes. This is especially important in Central Asia, where regional competitiveness depends heavily on the efficiency of external and transregional corridors. OECD analysis of the Trans-Caspian corridor underlines that corridor performance is shaped not only by transport assets, but also by coordination quality, process modernization, and data-related reforms.

Digitalization can strengthen public governance. E-government systems can reduce bureaucratic friction, improve regulatory clarity, and make the business environment more predictable (CAREC Secretariat, 2022).

Digitalization can widen market access and accelerate innovation diffusion. Digital platforms allow firms to reach suppliers, consumers, and knowledge networks beyond the limitations of local geography. In this sense, digitalization can partly compensate for remoteness by allowing firms and regions to participate more effectively in broader economic networks. This perspective aligns with World Bank assessments that future growth in Europe and Central Asia will depend

increasingly on entrepreneurship, technology adoption, and innovation diffusion (Belacin et al., 2025).

4. LIMITS AND CONDITIONS OF DIGITAL TRANSFORMATION

Despite this potential, digitalization does not produce uniform gains. Its effects depend on supportive institutional and territorial conditions. Where infrastructure, skills, or regulation are weak, gains may remain shallow. Likewise, where cross-border standards and procedures are poorly coordinated, digital reform in one country may not translate into regional efficiency (CAREC Secretariat, 2022; OECD, 2025).

Digitalization can improve efficiency and resilience, but it can also widen inequality if the benefits are concentrated in major urban centers or better-governed territories. For this reason, sustainable value creation in the digital era depends not simply on adopting digital tools, but on building the institutional, human-capital, and cooperative foundations needed to translate connectivity into broad-based competitiveness (Belacin et al., 2025; CAREC Secretariat, 2022).

5. CONCLUSION

This paper has argued that digitalization can partially mitigate the structural disadvantages of landlockedness in Central Asia by lowering coordination costs, improving logistics and trade facilitation, strengthening public governance, and widening market access. Yet digitalization cannot fully overcome geography on its own. Its developmental payoff depends on complementary capabilities, especially institutional quality, digital infrastructure, human capital, and regional cooperation. The central implication is that Central Asia should not treat digitalization as a substitute for geography, but as a strategic means of reducing the economic frictions through which geography constrains development.

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ACCOUNTING BASED VALUATIONS WITH MULTIPLE "ANCHORS"

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Abstract

Past accounting literature has shown the merits of valuations that have an "anchor" such as equity book value, capitalised earnings, a multiple of earnings or a multiple of other accounting variable of the firm, where the multiple is typically estimated from peer firms. This paper contributes to the literature the algebra of valuations in which a new anchor may or may not be reset each period. The algebra is a generator of valuation models, combines residual income valuation and AEG valuation, and reinterprets the generalisations of AEG valuation first introduced by Ohlson and Johannesson (2016). Valuations with an initial anchor and a different "terminal" anchor are discussed, as well as valuations under constant growth. Market price can be a useful initial anchor. Also cash flow based valuations can have multiple anchors.

Key words: accounting based valuations, valuation multiples, valuation anchors, residual income valuation, AEG valuation.

JEL classification: G12; G13.

Dependence on the Super App and Continued Use of Digital Payments Among Gen Z Users of Kaspi.kz

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Purpose - The objective of this study is to understand why young users in Kazakhstan continue to use Kaspi.kz for digital payments. Today, for many, Kaspi.kz is no longer just a payment app, but an integral part of daily life through which transfers, purchases, and other financial transactions are conducted. Therefore, this study examines not only factors related to the intention to continue using the service but also dependence on the super-app—that is, the extent to which Kaspi.kz is becoming a familiar, important, and irreplaceable tool. The study is based on the theory of continued use of information systems and the UTAUT2 model.

Design / Methodology / Approach - The study was conducted using a quantitative approach. Data were collected via an online survey among users from Kazakhstan aged 18–29 who had used Kaspi.kz digital payments within the last three months. A total of 280 people participated in the survey, of whom 260 valid responses were included in the final analysis. The questionnaire included questions on the core constructs of UTAUT2, as well as on variables such as expectation confirmation, satisfaction, habit, actual usage, and dependence on the super-app. At this stage, the analysis is based on descriptive statistics and the interpretation of mean values for key constructs.

Findings - The study showed that the main factors associated with continued use of Kaspi.kz digital payments among Gen Z users are convenience of the service, availability of conditions for its use, and perceived usefulness. In addition, habit, confirmation of expectations, and satisfaction with the user experience play a significant role. The results also indicate a moderate level of dependence on the super-app, reflecting how deeply integrated Kaspi.kz is into the daily financial practices of young users. At the same time, social influence proved to be the weakest factor, suggesting that continued use of the service is determined more by personal experience, habit, and convenience than by external pressure or the opinions of others.

Research Limitations / implications - The study has several limitations. First, the sample was selected using convenience sampling rather than random sampling, so the results cannot be fully generalized to all young people in Kazakhstan. Second, the sample was notably dominated by respondents aged 24–26 and residents of Almaty, which also limits the scope for generalization. Nevertheless, the study is of scientific interest, as there are currently very few local studies dedicated specifically to Kaspi.kz, specifically to Gen Z, and specifically to the combination of continuance intention and super-app dependency.

Practical implications - The practical value of this work lies in the fact that it helps to better understand how Kaspi.kz retains young users within its ecosystem. Judging by the results, the key factors here are not trends or peer influence, but convenience, usefulness, and the service becoming an integral part of daily life. These findings can be useful for improving digital payment services, increasing user retention, and tailoring the user experience more precisely to Gen Z's expectations.

Originality - The originality of this study lies in the fact that it combines UTAUT2, the theory of continued use, and the concept of super-app dependency in the context of Kazakhstan.

The study shows that for young users, Kaspi.kz is important not only as a technologically convenient service but also as part of their daily digital routine.

Keywords: Kaspi.kz, super-app, super-app dependency, continued use, digital payments, Gen Z, Kazakhstan, UTAUT2

A review of the adoption of IFRS in the CIS region: the case of Kazakhstan, Russia, Belarus

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Abstract

This study investigates the impact of International Financial Reporting Standards (IFRS) adoption on firm profitability in three Commonwealth of Independent States (CIS) countries – Kazakhstan, Russia, and Belarus – during the period from 2005 to 2020. Using panel data regression analysis with Driscoll-Kraay standard errors to address cross-sectional dependence, heteroscedasticity, and autocorrelation, we investigate how firm-level characteristics (leverage, liquidity, size), IFRS adoption timing, and macroeconomic factors (government effectiveness, unemployment, GDP growth) influence Return on Assets (ROA). These findings reveal that leverage is the sole statistically significant determinant of profitability, with a strong positive coefficient (approximately 3.5, $p < 0.01$), indicating that firms effectively using debt financing experience enhanced returns. In contrast, IFRS adoption timing shows no statistically significant direct effect on firm profitability across all model specifications. Other variables including liquidity, firm size, and macroeconomic conditions similarly show no significant relationships with profitability in this sample. The results suggest that, in this particular CIS context, IFRS adoption has not yet translated into measurable improvements in accounting-based performance (ROA), while firm financial structure and institutional environment play more decisive roles. These results highlight the contingent nature of IFRS benefits in transition economies.

Keywords: IFRS adoption, profitability determinants, CIS countries, ROA, leverage, capital structure

1. Introduction

International Financial Reporting Standards (IFRS) are one of the most important advancements for harmonizing global accounting systems during the last two decades. In 2024, over 140 countries will either require or allow use of IFRS for reporting purposes; these standards have been endorsed by global organizations as a means toward greater transparency, comparability, and integration into capital markets around the world. For transition economies, those that are changing from a centrally planned to a market-based economy, IFRS has received special attention from institutions, such as The World Bank and International Monetary Fund, as part of larger reform packages to attract foreign investments and promote economic growth.

As yet, however, the theory and empirical evidence linking IFRS and company performance in transition economies remains uncertain. While many advocates contend that IFRS improves accounting quality, diminishes information asymmetries and facilitates more efficient capital allocation, others believe that those advantages are contingent on institutional infrastructure, enforcement capabilities and levels of professionalism that may be lacking in transition economies. The inability to determine whether IFRS adoption improves the outcomes of companies operating in environments characterized by weak institutions, systematic state interference and the continued

presence of legacy systems from prior central planning represents a lack of understanding in the existing literature.

The objective of this research is to investigate the extent to which various factors influence firm profits in three (3) former USSR states (Commonwealth of Independent States) – Kazakhstan, Russia, and Belarus, between 2005 and 2020. All three countries share a common heritage from past rule by the Soviet Union; however, they have each used a different method of implementing International Financial Reporting Standards (IFRS) thus creating an interesting case study for examining how a change in accounting standards influences the performance of businesses located in transitional economies. Kazakhstan has generally been more progressive than either of the other two nations with respect to implementing IFRS by initially requiring banks to utilize IFRS in 2005 and subsequently expanding its requirements to additional sectors of the economy. Russia required financial institutions to use IFRS in 2004 and publicly traded companies in 2012. Belarus was also late to the IFRS requirement party for banks in 2007. Notably each of these nations used a method of "layering" by adding IFRS standards in addition to their existing national accounting standards, this creates what Alexander and Alon (2017) refer to as “dual institutionality” where there are multiple reporting mechanisms for different purposes and audiences.

1.1 Research questions and Contributions

This study investigates three main research questions:

First, there are several major determinants of firm profitability in CIS countries after the adoption of IFRS. Determining what impacts profitability from these countries will help explain how these firms function in transitional economies that are going through a change in their institutional environment. The study will look at two types of variables: (1) firm-specific variables (such as leverage, liquidity, and firm size) which managers can directly utilize to manage their business; and (2) macroeconomic variables (such as government effectiveness, unemployment rates, and GDP growth) that create an environment for all firms to operate in.

Second, does the timing of IFRS adoption have a statistically significant effect on the post-adoption profitability of firms, after controlling for other firm-specific and macroeconomic factors? This question seeks to determine whether the formal adoption of international accounting standards produces actual performance outcomes in transitional economies which are characterized by challenges in implementing standards, poor enforcement, and dual reporting systems. Additionally, since many countries invest a great deal of resources into developing and implementing the IFRS framework, and there is considerable support for this effort from international organizations, it is important to ascertain the degree to which IFRS adoption timing can be relied upon to predict post-adoption profitability.

Third, in what way do factors of profitably relate to each other in CIS nations when compared to theoretical expectations and other environments? By taking this comparative approach, we can find out if the relationship between profitability in these transitional economies is similar or different from developed markets—that is, did these countries create different formative structures due to influences such as their past history in the Soviet Union, processes that are still ongoing during transition, and substantial government interactions within each individual country's economy?

This study makes several contributions to the literature:

Empirically, we provide among the first quantitative analyses of profitability determinants across multiple CIS countries in the post-IFRS adoption period, focusing on an understudied region that combines unique institutional characteristics that are rarely considered together. While some recent research investigated individual CIS countries (Alon, 2013; Nurkasheva et al., 2018) or specific aspects of the accounting practices (Alexander & Alon, 2017), empirical research to date has not

provided a comprehensive analysis of the factors that determine profitability, as well as whether IFRS adoption has impacted profitability in multiple CIS countries.

Theoretically, our research findings contribute to an understanding of the function of accounting standards in dual institutional environments. The coexistence of both IFRS and National Accounting Standards results in the establishment of separate legitimacy for the use of different reporting frameworks (i.e., National Accounting Standards provide legitimacy for purposes such as tax compliance and government oversight, while IFRS establishes legitimacy for use by international investors and creditors). Thus, our empirical findings provide evidence indicating that, in these dual institutional environments, the formal adoption of international accounting standards will not positively impact any of the existing information environments or decision-making processes that impact profit-making, thereby challenging the long-held assumptions found in much of the IFRS literature that simply adopting these standards would create benefits.

Methodologically, we have performed an analysis of panel data using Driscoll-Kraay standard errors to account for cross-sectional dependence, heteroscedasticity and autocorrelation, which are econometric problems particularly relevant in small sample sizes of countries facing common shocks (Driscoll & Kraay, 1998). Thus, the above method adds significantly greater reliability to the results compared to other standard panel techniques, as applied in this survey.

For policy and practice, the findings have important implications for policymakers in transition economies considering or implementing IFRS, for international organizations promoting IFRS adoption, and for managers operating in dual reporting environments. Understanding that formal IFRS adoption shows no significant direct relationship with profitability in CIS contexts, while leverage decisions strongly affect performance, suggests priorities for both policy interventions and managerial attention.

1.2 Key Findings Preview

The results question common perceptions of how transitioning economies rely on IFRS accounting. For example, firm profitability has been found to have no statistically significant direct effects from the timing of IFRS adoption according to any of models measured even while there were positive point estimates and strong correlations to institutional quality measure indicators. Even though there is statistical insignificance when controlling for firm characteristics and country-level macroeconomic conditions, the overall results suggest that formal IFRS adoption does not lead to observable firm performance in countries that do not enforce IFRS through the use of dual-reporting systems (i.e., FIFO or LIFO financial reporting) and have retained prior Soviet-style accounting philosophy.

In contrast, leverage emerges as the only statistically significant determinant of profitability, with a strong positive coefficient indicating that firms effectively using debt financing experience achieve higher returns. This finding highlights that real financial management decisions—particularly capital structure optimization—are more important for profitability than formal compliance with international accounting standards in these transition economies.

The dominance of capital structure over accounting system changes as a determinant of profitability, coupled with the limited adoption of IFRS, supports the concept of dual institutionalism, where IFRS primarily serve as a signaling mechanism for an international audience, while national standards continue to regulate operational decisions. This has significant implications for understanding how accounting standards function in transition economies and for developing realistic expectations regarding the benefits of IFRS adoption.

2. Literature Review

2.1 IFRS Adoption in Transition Economies:Institutional Context

Numerous studies attempted to review the implementation of IFRS in the countries with transition economies. This process represents a significant institutional change which was a consequence of a particular presser from international financial institutions such as World Bank and IMF (Judge et al. 2010)

Transition economies, commonly understood as countries shifting from centrally planned systems to market-oriented structures, differ significantly in the pace nature of their institutional transformation (Alon & Hageman, 2013). Some countries in Central and Eastern Europe are characterized by code-low legal system traditions, weak regulatory frameworks and underdeveloped capital markets (Albu & Albu, 2014). These structural features can complicate the effective implementation of International Financial Reporting Standards. As highlighted by Karampinis and Hevas (2011), such conditions may limit the incentives of both managers and auditors to ensure high-quality financial reporting, thereby reducing the potential benefits associated with IFRS adoption.

During the existence of the Soviet Union, countries were largely isolated from Western accounting theories and practices. This legacy, as Magki and Preobrazhenskaya (2005) note, led to specific difficulties in the adoption of International Financial Reporting Standards (IFRS) in the CIS countries. Garanina and Kormiltseva (2013) also emphasize that the Soviet accounting system, characteristic of all former republics of the USSR, constituted a single, unified accounting model. It was adapted to the conditions of centralized planning and placed the primary emphasis on control and measurement, rather than on informational usefulness for managerial decision-making. Alexander (2013) emphasizes that accounting in the Soviet system was subordinate to operational management tasks and strictly regulated by a rigid chart of accounts. In the Soviet system, form was prioritized over the economic substance of transactions. Accountants operated within the framework of strictly regulated instructions, and the concept of professional judgment was virtually absent.

These historical characteristics have contributed to the persistence of institutional and behavioral patterns that are not fully aligned with IFRS principles. In particular, the application of IFRS requires the use of professional judgement, interpretation, and a focus on the economic substance of transactions. However, in post-Soviet contexts, such approaches may conflict with established practices shaped by decades of rule-based accounting.

The literature also highlights the broader cultural dimension of this issue. Szychta and Kabalski (2016) refer to the concept of "Homo Sovieticus," describing individuals who tend to rely on hierarchical authority and exhibit limited independence in decision-making. Such behavioral traits may reduce the willingness of accounting professionals to exercise judgment in applying IFRS. Empirical evidence supports this view. For example, research on Ukraine suggests that legacy accounting practices continue to influence contemporary reporting environments, thereby limiting the effective application of international standards (Yang et al., 2013). Similar patterns have been identified in other post-Soviet countries, including Moldova, where elements of the previous accounting system remain embedded in current practices (Alexander & Ghedrovici, 2013).

2.2 IFRS Implementation Approaches in CIS Countries

CIS countries have followed different paths in implementing IFRS, resulting in diverse financial reporting practices across the region. In Russia, implementation was planned in early 2000s. The

Ministry of Finance announced that Russian banks would transition to IFRS starting in 2004, and that all publicly listed companies in 2005. While banks adopted IFRS as planned, the broader reform for public companies was postponed and later suspended. And only in 2010 Russian government revisited IFRS adoption process, with the mandatory IFRS reporting for listed companies later in 2012 (IAS Plus, 2016). These decisions reflect institutional resistance and implementation challenges. Despite these developments, national accounting standards (RAS) remain in use, and companies are still required to prepare financial statements in accordance with domestic regulations. The coexistence of IFRS and national standards has led to the emergence of a dual reporting system. In practice, firms often maintain parallel accounting frameworks or rely on reconciliation procedures to convert financial statements from national standards to IFRS. This arrangement increases administrative complexity and imposes additional costs on organizations.

This situation can be understood through the concept of "dual institutionality," which refers to the simultaneous presence of different institutional logics within a single system (Alon, 2013). In the Russian context, IFRS did not fully replace national standards but instead developed alongside them. Each system serves a distinct purpose: national standards are primarily oriented toward taxation and regulatory compliance, emphasizing legal form and documentation, whereas IFRS are designed to meet the informational needs of investors, focusing on economic substance and fair value measurement.

Contrary to initial expectations, the adoption of IFRS in Russia has not led to full convergence between national and international accounting practices. Empirical studies indicate that substantial differences between the two systems remain (Kostina & Stolyarova, 2015). Several factors contribute to this outcome, including the continued linkage between accounting and taxation, conceptual differences such as the treatment of substance over form, and the limited use of professional judgment in financial reporting (Garanina & Kormiltseva, 2013).

Belarus has adopted a comparable approach to IFRS implementation, initially introducing international reporting requirements for banks and financial institutions in 2007 while continuing to retain its national accounting framework (Alexander & Alon, 2017). Rather than replacing existing standards, the country has incorporated IFRS alongside domestic regulations, creating a layered system in which new rules coexist with established practices. This approach can be understood within the broader concept of institutional layering, whereby new regulatory elements are introduced without fully eliminating prior structures (Mahoney & Thelen, 2010). Such a strategy allows governments to preserve control over national accounting systems while simultaneously demonstrating alignment with international standards to external stakeholders, including investors. Empirical evidence suggests that, in Belarus, national accounting standards and IFRS continue to serve distinct roles. While IFRS-based reporting is generally aimed at external users, such as international investors, domestic reporting remains focused on regulatory and administrative purposes (Alexander & Alon, 2017). As a result, there is limited pressure to harmonize the two systems, given their differing objectives and audiences.

Furthermore, although the terminology used in Belarusian accounting regulations may resemble IFRS, the underlying concepts often differ in substance. In particular, the notion of professional judgment is interpreted in a more formalized manner, referring to internally established accounting policies rather than the flexible application of principles in situations involving uncertainty

(Republic of Belarus, 2015a). This distinction reflects a continued emphasis on rule-based practices, which may constrain the effective implementation of IFRS principles.

Kazakhstan is one of the first CIS countries to officially adopt IFRS, beginning in 2004 for banks and in 2005 for listed companies. Several researchers (Tyrrall, Woodward & Rakhimbekova, 2007; Koptelov, 2018) have studied this process. Their findings show both progress and difficulties. On the positive side, Kazakhstan has made significant efforts to align national standards with IFRS and to improve accounting education. However, problems remain, such as the lack of strong enforcement, limited understanding of fair value accounting, and a continuing influence of tax-based reporting traditions.

The parallel existence of IFRS and national standards raises fundamental questions about which framework truly influences managerial decisions and resource allocation. If national standards remain dominant for tax and regulatory purposes, IFRS may serve primarily as a signal to international audiences rather than fundamentally changing information environments.

2.3 IFRS and Accounting Quality: Mixed Evidence

The effect of adopting IFRS on the quality of financial reports has yielded inconsistent results and is primarily influenced by the original institutional factors of the country. Barth et al. (2008) indicated that companies that use IFRS have been able to produce lower levels of Earnings Management, more timely recognition of losses, and greater value relevance in their financial reporting than those who do not. In addition, their research on companies voluntarily adopting IFRS in 21 countries demonstrated that companies adopting high-quality standards can improve the quality of their financial reporting.

Research evidence has produced mixed or inconclusive findings. According to Ahmed et al. (2013), 20 countries in their study saw a decrease in perceived quality of accounting following mandatory IFRS adoption. In their analysis of the Association of African Nations (ANA), Agana et al. (2023) found that there was no significant association between the proxies of firm adoption or enforcement of IFRS and quality of accounting. However, the authors did conclude that the legal environment had obta significant impact on the managing of earnings; companies located in countries with a common law legal system had less earnings management than those in civ.

Furthermore, Jeanjean and Stolowy (2008) provide research that demonstrates additional difficulties with implementation in countries that transitioned to IFRS. They found in Australia, France, and the United Kingdom that there was no observable decline in earnings management rates after IFRS adoption. Albu et al. (2013) have provided evidence that Romania, which has been a member of the European Union since 2007, did not experience success in transferring the "true and fair view" methodology as assumed by the local population.

Brown (2011) argues that while IFRS represents high-quality standards, adoption alone does not automatically lead to the anticipated economic benefits. The benefits obtained from an IFRS adoption depend heavily on legal enforcement mechanisms, quality of governance, pre-existing gaps between local and international standards, capital market development, ownership structure, and the degree of professional capacity available. Daske et al. (2013) distinguished between "label"

adopters (firms adopting IFRS only in name) and "serious" adopters (firms making substantive changes), finding that only serious adoption led to increased liquidity and decreased cost of capital.

In the context of CIS countries, several factors suggest accounting quality improvements may be limited: weak enforcement mechanisms, the persistence of a rule-based form-over-substance approach inherited from the Soviet period, strong linkages between accounting and taxation, concentrated ownership structures, limited capital market development. In addition, the limited availability of professionals with expertise in IFRS and the continued use of dual reporting system further complicate the effective implementation of international standards. Empirical evidence supports this view. For example, Alexander and Alon (2017) show that in Belarus, national accounting regulations continue to dominate in operational contexts, while IFRS-based reporting is used primarily for external purposes. As a result, different reporting frameworks are applied to different user groups, rather than being integrated into a single coherent system.

This separation of reporting functions suggests that IFRS adoption in such environments may serve more as a signaling mechanism—demonstrating formal alignment with international practices—rather than leading to substantive changes in the underlying information environment.

An important methodological consideration is measuring the degree versus timing of IFRS adoption. This study measures IFRS adoption as a binary variable indicating whether a country has introduced mandatory IFRS, reflecting a change in the institutional regime rather than the quality of implementation. While this measurement cannot distinguish between serious and formal implementation, it provides a clear opportunity to test of whether the adoption event corresponds with changes in firm profitability. The descriptive statistics show that 56.25% of observations relate to periods after the implementation of IRFS, reflecting staggered adoption across the three countries.

2.4 Economic Outcomes of IFRS Adoption

Beyond accounting quality, prior research has explored whether IFRS adoption influences broader economic outcomes, including productivity, access to capital, and overall firm performance. Banker et al. (2021) found that mandatory IFRS-adopting countries experienced significant increases in total factor productivity and labor productivity, with greater improvements for countries without prior IFRS convergence. They identify mechanisms including reduced information asymmetry, improved comparability, facilitated M&A activity, and better managerial decision-making. However, they caution that effects may be concentrated in specific sectors and that institutional context matters.

Research on the cost of capital shows mixed results depending on enforcement. Daske et al. (2008) found that firms in countries with stronger enforcement and institutions experienced greater increases in market liquidity and decreases in cost of capital, while firms in weaker institutional environments showed limited or no benefits from capital markets capital market benefits. For CIS countries with weak enforcement and underdeveloped capital markets, cost of capital benefits may be limited, though firms accessing international markets could still benefit.

The relationship between IFRS adoption and credit market outcomes has also been examined in prior research. Evidence from Latin America suggests that the introduction of IFRS may contribute

to a reduction in borrowing costs. For example, De Moura et al. (2020) report a significant decline in the cost of debt following IFRS adoption, while de Lima et al. (2018) find that this effect is more pronounced in countries with weaker legal enforcement. Their results imply that improvements in accounting standards can, to some extent, compensate for deficiencies in institutional quality. For CIS countries where directed lending by state-owned banks is common, IFRS-based credit information may have limited influence. Alexander and Alon (2017) document that in Belarus, state-owned banks are directed by government to lend to specified enterprises without creditworthiness evaluation, at government-specified below-market rates. In such environments, IFRS effects on credit allocation may be minimal.

IFRS Adoption Timing and Firm Performance

Beyond implementation quality, the timing of adoption itself may influence firm profitability through several mechanisms. The binary assessment of IFRS adoption (pre- versus post-adoption) reflects changes in the institutional regime, which can impact performance indicators independently of specific profitability factors.

The adoption of IFRS can also be interpreted as a signal of a firm's commitment to transparency and alignment with internationally recognized reporting practices, potentially enhancing firm reputation and stakeholder confidence. Daske et al. (2008) found that firms in adopting countries experienced increased market liquidity and reduced cost of capital in strong enforcement environments. For CIS countries, even if implementation quality is imperfect, the signal to international investors and creditors could provide benefits. IFRS adoption also facilitates access to international capital markets by reducing information processing costs for foreign investors. Covrig et al. (2007) demonstrated that IFRS adoption increases foreign mutual fund ownership. For CIS firms seeking foreign investment or international debt markets, IFRS adoption could lower financing costs and improve capital availability.

The adoption timing variable in CIS countries takes into account unique contextual factors. Russia mandated IFRS for listed companies in 2012, Kazakhstan for banks in 2004 with subsequent expansion, and Belarus beginning in 2007. The IFRS variable captures these country-specific timing differences. The transition to dual IFRS/national reporting represents significant organizational burden. Alexander and Alon (2017) documented substantial costs associated with operating and maintaining dual accounting systems. Initially, these costs may reduce profitability, but over time companies may realize benefits from improved accounting systems and enhanced credibility.

IFRS adoption in CIS countries occurred alongside broader institutional reforms. The correlation between IFRS adoption and government effectiveness ($r = 0.45$) suggests adoption may be part of broader governance improvements. The variable may therefore capture not only direct IFRS effects but also concurrent institutional changes.

The studies performed that have focused on adoption timing effects have yielded mixed results. Christensen et al. (2015) determined that mandatory adoption of IFRS was associated with a reduced cost of capital only where there was strong enforcement in place. When comparing "serious adopters" to "label adopters," Beneish et al. (2015) found that "serious adopters" benefited from adopting IFRS more than simply having the label without actually having adopted IFRS.

Finally, Rendered et al. (2009) investigated IFRS adoption by firms in Hungary, and determined that similarly to their findings with other studies, IFRS adoption increased comparability but provided only modest performance improvements, due in part to continued dominance of tax-based accounting and insufficient enforcement of IFRS.

Based on the literature, the expected relationship between IFRS adoption timing and firm profitability in CIS countries is theoretically ambiguous. Positive effects could arise if IFRS successfully signals transparency, facilitates capital access, or improves organizational capabilities. Negative effects could occur if adoption costs outweigh benefits, or if adoption is merely ceremonial. In addition, under the previous discussion of the unique circumstances and challenges faced by firms in the CIS (due to dual institutionality, Soviet Style practices, weak enforcement of laws), it can be anticipated that any positive effect will be modest at best. However, examining this relationship empirically provides insights into whether IFRS adoption represents substantive institutional change or primarily ceremonial compliance.

2.5 Profitability Determinants in Transition Economies

The profitability of companies in emerging markets depends on both specific factors and macroeconomic conditions, and the relative importance of these factors may differ from that of developed markets due to institutional features.

Firm-Level Determinants

The relationship between leverage and profitability has been widely examined in the literature, with empirical findings often yielding inconsistent results. From a theoretical perspective, the trade-off theory suggests that firms determine their capital structure by balancing the tax advantages of debt against the potential costs associated with financial distress, implying the existence of an optimal level of leverage (Modigliani & Miller, 1963). In contrast, agency theory emphasizes the role of debt as a governance mechanism, arguing that leverage can reduce agency costs by limiting managerial discretion over free cash flows (Jensen, 1986). In developed financial systems, moderate leverage often enhances profitability through tax shields and disciplining effects. However, in developing markets with higher bankruptcy costs and less efficient procedures, leverage tends to have negative relationship with profitability (Myers, 1984). For CIS countries with less developed capital markets and potentially less efficient bankruptcy procedures, the optimal leverage level may differ.

Nurkasheva et al. (2018) found that IFRS 16 would significantly increase reported leverage ratios for Kazakhstani companies, particularly retailers (estimated 98% debt growth) and airlines. This suggests leverage is an important consideration and that accounting standards can significantly affect how it is measured and perceived.

Larger firms typically benefit from economies of scale, greater capital market access, enhanced bargaining power, and better ability to attract qualified employees. In transition economies, size may be particularly important because larger firms can access international capital markets, attract foreign investors, implement sophisticated management practices, hire professionals with international training, and withstand economic shocks more effectively.

Liquidity management requires firms to balance competing objectives related to financial security and efficient use of resources. While maintaining higher levels of liquidity can enhance a firm's ability to meet short-term obligations and reduce financial risk, excessively high liquidity may reflect inefficient allocation of assets or missed investment opportunities. This issue is particularly relevant in transition economies, where financial systems are less developed and access to external funding is often constrained. In such environments, firms may rely more heavily on internal liquidity to cope with economic uncertainty, including macroeconomic instability and limited protection of creditor rights.

Macroeconomic Determinants

Government effectiveness has an important effect on the business environment and can affect the performance of a company through reduced transaction costs, improved contract enforcement, better infrastructure, and reduced corruption. The government effectiveness scores of the CIS countries are often low to moderate, which is indicative of ongoing challenges in institutional development.

The Job Market Condition and Economic Performance have a relationship through Unemployment Rate, high unemployment is usually an indication of weak economic performance, less than normal demand for goods/services, or a labor market with too many qualified applicants relative to available jobs. The Unemployment Rate in developing countries (aka CIS) varied greatly over the time period observed due to commodities prices and regional economic shocks driving their boom/bust cycles.

GDP growth reflects macroeconomic dynamics and aggregate demand. Sustained growth typically creates favorable conditions through expanded business opportunities, consumer spending, and investment, although rapid growth can also intensify competition and increase production costs. CIS countries experienced highly volatile GDP growth between 2005 and 2020, including a sharp contraction during the 2008-2009 crisis and a subsequent recovery.

In transition economies, these relationships may be influenced by other factors as well: (1) the extent to which the state is involved in determining how companies perform, (2) the extent to which concentrated ownership reduces the separation between ownership and control, (3) by the existence of institutional voids which affect the enforcement of contracts and the protection of property rights, and (4) by the fact that globally integrated firms have different operating environments than firms that operate strictly domestically.

2.6 Research Gaps and Hypothesis

While a lot of research has been done on how adopting IFRS will affect profitability in the long run, there are still major gaps in this area of study. A lot of research on IFRS adoption has concentrated on either developed markets or emerging markets, leaving a significant lack of research regarding IFRS adoption and profitability in the countries of the CIS. While some recent studies have looked at IFRS adoption and profitability in individual CIS countries (Alon 2013; Alexander & Alon 2017; Nurkasheva et al. 2018), very little research has been conducted on IFRS adoption and its effects on profitability in multiple CIS countries since they adopted IFRS.

The CIS has a unique mix of a post-Soviet legacy, a transitioning environment, continuing dual account systems (historically, under Soviet law as well as through IFRS), and extensive government involvement in accounting, as well as introducing IFRS. While all countries have adopted IFRS, they continue to experience challenges with implementation. As a result, it is unclear if the adoption of IFRS has changed the information environment in such a way as to affect real decision-making processes and results in the CIS. Each country has approached their IFRS transition differently (Kazakhs being more proactive versus Russian and Belarusian layering) which may allow for the investigation as to whether approach to implementation actually matters at the end of the day.

The direct effect of IFRS adoption timing on profitability has received limited attention in CIS research. While studies examine accounting quality changes and broader economic outcomes, few directly test whether adoption timing predicts firm profitability after controlling for other determinants. The correlation analysis reveals important patterns: positive correlation with ROA ($r = 0.133$), strong correlation with government effectiveness ($r = 0.451$), negative correlations with unemployment ($r = -0.505$) and GDP growth ($r = -0.472$), and negative correlation with liquidity ($r = -0.397$). These patterns suggest IFRS adoption timing may be endogenous to economic conditions and institutional quality, necessitating careful interpretation.

The purpose of this research is to identify the limitations within the existing literature and analyze the factors affecting the profitability of businesses in Kazakhstan, Russia and Belarus from 2005 to 2020.The research studies five major questions: 1 What are the significant drivers of profitability for firms within the CIS (Commonwealth of Independent States) since post-IFRS (International Financial Report Standard) adoption? 2 Does leverage play an important role in determining firm profitability? 3 Does the timing of IFRS adoption influence a firm's profitability? 4 Do macroeconomic variables have an influence on firm profitability? 5 How do the findings of this study compare with the theoretical framework and prior studies in other settings?

The literature review raises a number of expectations. Leverage is anticipated to exhibit a strong correlation with profitability; this correlation may be favorable if businesses are able to optimize their capital structure, but it may be unfavorable if bankruptcy costs are high in CIS contexts. Because of the benefits of scale, improved access to resources, and the capacity to negotiate challenging institutional environments, firm size is anticipated to exhibit a positive relationship. Given the trade-offs between resource utilization and stability, liquidity has unclear expectations. As better institutions lower transaction costs and enhance the business environment, government effectiveness is anticipated to exhibit a positive relationship. Although directions may vary depending on firm characteristics, it is anticipated that unemployment and GDP growth will exhibit relationships reflecting macroeconomic conditions.

The expectations surrounding IFRS adoption are theoretically unclear. There could be good effects from signaling, better access to capital, or learning within the organization. However, due to challenges in implementation, such as needing to report to two different places, weak enforcement, and the continued use of form-over-substance practices, the effects may be small or not at all. The negative correlations with unemployment and GDP growth suggest adoption were processed in a difficult economic time, which could hide possible benefits. The strong correlation with government effectiveness suggests any positive IFRS effects may be difficult to separate from concurrent institutional improvements. Also, it may be hard to point out the IFRS positive effects

from the improvements in institutions that were occurred at the same time. The empirical analysis evaluates these expectations, acknowledging that the limited sample size and distinctive institutional context may constrain statistical power and the generalizability of results.

3. Methodology

3.1 Data and Sample

This research examines the impact of International Financial Reporting Standards (IFRS) adoption on firm performance in three Commonwealth of Independent States (CIS) countries: Kazakhstan, Russia, and Belarus. The analysis employs panel data spanning from 2005 to 2020, encompassing 48 firm-year observations across three countries (ID = 3). The panel is strongly balanced for most variables, with 16 time periods per entity.

3.2 Variables

Dependent Variable:

- Return on Assets (ROA): Measured as the ratio of net income to total assets, serving as the primary indicator of firm profitability and operational efficiency.

Independent Variables:

- IFRS Adoption: A binary variable taking the value of 1 for years following IFRS adoption and 0 otherwise.
- Liquidity: Measured as the current ratio, representing the firm's ability to meet short-term obligations.
- Total Assets (Log): The natural logarithm of total assets, controlling for firm size.
- Leverage: The debt-to-equity ratio, capturing the firm's capital structure.
- Government Effectiveness: A country-level institutional quality measure obtained from World Bank Governance Indicators.
- Unemployment Rate: The total unemployment rate as a percentage of the labor force, representing macroeconomic conditions.
- GDP Growth: Annual GDP growth rate, capturing the overall economic environment.

3.3 Descriptive Statistics

Table 1.

Variable	Obs	Mean Std. Dev.	Min	Max
ROA	48	.7044666 8.825162	-55,1743	22,04584
Liquidity	48	34.61752 10.19494	17,02391	57,62942

TotalAssets	44	46.01549 10.62727	25,3756	69,74205
Leverage	48	12.64207 2.595016	5,2	19,8
Government~a	48	-.506749 .3693448	-1,20979	0,105691
Unemployme~l	47	4.819149 2.184098	0,5	8,3
GDPgrowtha~l	48	3.549395 4.127329	-7,79999	10,7
IFRSadoption	48	.5625 .501328	0	1

Table 1 presents the descriptive statistics for all variables. The mean ROA across the sample is 0.70%, with substantial variation (standard deviation of 8.83), ranging from -55.17% to 22.05%. The average liquidity ratio stands at 34.62%, while mean leverage is 12.64%. Approximately 56.25% of the observations occur in the post-IFRS adoption period. Government effectiveness estimates average -0.51, reflecting institutional challenges characteristic of transition economies. The mean unemployment rate is 4.82%, and average GDP growth is 3.55% annually.

3.4 Correlation Analysis

Table 2

	ROA	Liquid~y	TotalA~s	Leverage	Govern~a	Unempl~l	GDPgro~l	IFRSad~n
ROA	1							
Liquidity	-0,1097	1						
TotalAssets	-0,1296	-0,2177	1					
Leverage	0,481	-0,0734	-0,227	1				
Government~a	0,0123	0,0932	-0,1698	-0,4449	1			
Unemployme~l	-0,0746	0,419	-0,0434	-0,1796	0,1939	1		
GDPgrowtha~l	0,1249	0,1488	-0,3005	0,107	-0,1377	0,2621	1	
IFRSadoption	0,1328	-0,3969	0,0571	-0,1072	0,4506	-0,505	-0,4724	1

The correlation matrix reveals several notable relationships. ROA demonstrates a strong positive correlation with leverage (0.48), suggesting that firms with higher debt levels achieve better returns in this context. IFRS adoption shows negative correlations with liquidity (-0.40) and GDP growth (-0.47), while positively correlating with government effectiveness (0.45). This pattern suggests that IFRS adoption occurred during periods of institutional strengthening but economic challenges.

3.5 Panel Unit Root Tests

Given the panel data structure, I conducted comprehensive stationarity tests to avoid spurious regression results. The Levin-Lin-Chu (LLC) test was applied for balanced panels, while the Im-Pesaran-Shin (IPS) test was used for unbalanced variables.

Results of Unit Root Tests:

- ROA: Stationary at levels (LLC: p = 0.0082)
- Liquidity: Non-stationary at levels (LLC: p = 0.3352); stationary at first difference (p = 0.0412)
- Total Assets: Non-stationary at levels; log-transformed first difference stationary (IPS: p = 0.0126)
- Leverage: Stationary at levels (LLC: p = 0.0245)
- Unemployment: Non-stationary at levels; stationary at first difference (IPS: p = 0.0350)
- GDP Growth: Stationary at levels (LLC: p = 0.0066)
- Government Effectiveness: Included at levels
- IFRS Adoption: Non-stationary at levels; stationary at first difference (LLC: p = 0.0022)

Based on these results, I employ first differences for Liquidity (dLiq), log of Total Assets (dLTA), Leverage (dLev), Unemployment (dUnempl), and IFRS adoption (dIFRS) in regression models to ensure stationarity and avoid spurious regression.

3.6 Econometric Specification

I estimate the following panel data model:

$$ROAit=\beta0+\beta1dLiqit+\beta2dLTAit+\beta3dLevit+\beta4GovEffit+\beta5dUnemplit+\beta6GDPGrowthit+\beta7 dIFRSit+\beta8Year2020it+\epsilon it$$

Where:

- **ROA**: Return on Assets for firm iii in year ttt. This is the dependent variable, indicating the profitability of a firm relative to its total assets.
- **dLiq**: Change in liquidity for firm iii in year ttt. This variable likely measures a firm's liquidity position and how it has changed over time. It could represent measures like the current ratio, cash holdings, or other liquidity ratios. The "d" suggests that this is the difference in liquidity compared to a previous period, capturing the change in liquidity.
- **dLTA**: Change in the firm's leverage-to-assets ratio (or a related metric, depending on the context). This captures the extent to which a firm has changed its capital structure (debt relative to total assets).
- **dLev**: Change in leverage, or more specifically, the change in the firm's debt-to-equity ratio. Leverage is an important determinant of financial risk and might impact a firm's profitability and risk profile.

- **GovEff**: Government efficiency for firm iii in year ttt. This might refer to factors such as regulatory quality, the ease of doing business, or the overall efficiency of government services that could affect a firm's ability to operate effectively.
- **dUnempl**: Change in unemployment rate in the country or region where firm iii is located in year ttt. Unemployment levels can affect consumer demand, firm profitability, and the overall economic environment in which firms operate.
- **GDPGrowth**: Growth rate of the Gross Domestic Product (GDP) for the country or region in year ttt. This is a macroeconomic variable that often reflects the overall economic health of the country and can influence corporate performance.
- **dIFRS**: This likely represents the change in whether the firm adopts International Financial Reporting Standards (IFRS) in year ttt. The change in accounting standards might have an impact on financial reporting, performance, and comparability across firms.
- **Year2020**: A binary (dummy) variable that indicates whether the observation corresponds to the year 2020. This variable is typically included to account for the significant disruptions caused by the COVID-19 pandemic, which could have affected firm performance in 2020.
- **ε_{it}**: The error term, representing unobserved factors that may affect the profitability of firm iii in year ttt that are not included in the model.

3.7 Model Selection and Diagnostic Tests

We estimated pooled ordinary least squares (OLS), fixed effects (FE), and random effects (RE) models. The Hausman test ($\chi^2 = 3.56$, $p = 0.8946$) failed to reject the null hypothesis, suggesting that random effects estimators are consistent and efficient. However, given the small number of cross-sectional units (3 countries) and country-specific characteristics, we prioritize fixed effects interpretation.

Diagnostic Tests:

1. Multicollinearity: Variance Inflation Factors (VIFs) range from 1.20 to 1.86, with a mean VIF of 1.41, indicating no serious multicollinearity concerns.

2. Heteroskedasticity: The modified Wald test for groupwise heteroskedasticity strongly rejects homoskedasticity ($\chi^2 = 144.23$, $p < 0.001$), indicating the presence of heteroskedastic errors.

3. Autocorrelation: The Wooldridge test fails to detect first-order autocorrelation ($F = 0.184$, $p = 0.7095$).

4. Cross-sectional Dependence: Pesaran's test reveals weak cross-sectional dependence (test statistic = 1.736, p = 0.0826), with an average absolute correlation of 0.321 among residuals.

3.8 Robust Estimation

Given the presence of heteroskedasticity and potential cross-sectional dependence, we employ two robust estimation techniques:

1. Driscoll-Kraay Standard Errors: This method produces heteroskedasticity and autocorrelation consistent (HAC) standard errors that are robust to general forms of cross-sectional and temporal dependence.
2. Feasible Generalized Least Squares (FGLS): We estimate a panel-specific AR(1) model with FGLS to address both heteroskedasticity and autocorrelation simultaneously.

4. Results

4.1 Main Regression Results

Table 3 presents the regression results across different specifications. We report pooled OLS, fixed effects with robust standard errors (Driscoll-Kraay), and FGLS estimates with panel-specific AR(1) correlation structure.

Table 3: Regression Results for ROA Determinants

Variable	Pooled OLS	Fixed Effects	Driscoll–Kraay	FGLS
dLiquidity	–0.203 (0.202)	–0.191 (0.201)	–0.191 (0.118)	–0.230 (0.159)
dLog(TotalAssets)	–0.603 (11.385)	–7.001 (12.467)	–7.001 (13.016)	13.293 (8.125)
dLeverage	3.637*** (0.677)	3.498*** (0.669)	3.498*** (0.943)	3.668*** (0.544)
Gov. Effectiveness	2.547 (5.303)	5.507 (5.914)	5.507* (3.013)	6.913* (4.086)
dUnemployment	–0.242 (1.506)	0.215 (1.502)	0.215 (0.555)	0.043 (0.986)
GDP Growth	0.175 (0.416)	0.589 (0.469)	0.589 (0.311)	0.139 (0.294)
dIFRS	0.952 (4.733)	0.972 (4.675)	0.972 (1.326)	4.319 (3.652)
Year 2020	5.434 (4.849)	7.186 (4.904)	7.186** (3.529)	3.508 (3.697)
Constant	0.793 (2.423)	0.776 (2.491)	0.776 (1.574)	1.575 (1.609)
Observations	39	39	39	39
R-squared	0.580	0.616 (within)	0.616	–

Number of groups	–	3	3	3
F-statistic	5.19***	5.62***	2.75	–
Wald χ^2	–	–	–	63.78***

Note: Standard errors in parentheses. ***p<0.01, **p<0.05, *p<0.10

4.2 Key Findings

Leverage Effect: The most robust finding across all specifications is the strong positive effect of changes in leverage on ROA. The coefficient ranges from 3.498 to 3.668 and is statistically significant at the 1% level in all models. This suggests that a one-unit increase in the change in leverage is associated with approximately a 3.5 to 3.7 percentage point increase in ROA. This finding indicates that firms in CIS countries that increased their debt financing experienced improved profitability, possibly due to the tax benefits of debt or effective deployment of borrowed capital.

IFRS Adoption: The coefficient for IFRS adoption (measured in first differences) is positive across all specifications but lacks statistical significance in most models. The FGLS estimate shows the largest magnitude (4.319) but remains statistically insignificant ($p = 0.237$). While the point estimates suggest a potential positive association between IFRS adoption and firm performance, the lack of statistical significance prevents us from drawing definitive conclusions about the direct performance impact of IFRS adoption in these CIS countries.

Government Effectiveness: Institutional quality, measured by government effectiveness, shows consistently positive coefficients ranging from 2.547 to 6.913 across specifications. The effect becomes marginally significant in the robust models (Driscoll-Kraay: $p = 0.066$; FGLS: $p = 0.091$), suggesting that better governance and institutional quality are associated with improved firm performance. A one-unit improvement in government effectiveness is associated with approximately 5.5 to 6.9 percentage point increase in ROA.

Liquidity: Changes in liquidity consistently show negative coefficients across all models, though none reach conventional significance levels. The estimates range from -0.191 to -0.230, suggesting that increases in liquidity ratios are associated with modest decreases in ROA, potentially indicating that excessive liquidity represents underutilized assets.

Firm Size: The effect of changes in log total assets is inconsistent across models, with coefficients ranging from -7.001 to 13.293, none of which are statistically significant. This instability suggests that size changes do not have a clear or robust relationship with profitability in this sample.

Macroeconomic Variables: Neither unemployment nor GDP growth demonstrates statistically significant effects on ROA in the final specifications. While GDP growth shows positive coefficients in fixed effects models (0.589) and smaller positive effects in FGLS (0.139), the large standard errors prevent definitive conclusions.

COVID-19 Effect (Year 2020): The Year 2020 dummy variable captures the impact of the COVID-19 pandemic. The coefficient is positive across all specifications (ranging from 3.508 to 7.186) and reaches statistical significance in the Driscoll-Kraay specification ($p = 0.066$), suggesting that firms may have demonstrated resilience or adapted successfully to pandemic conditions, though this effect varies by estimation method.

4.3 Model Fit and Specification

The fixed effects model explains approximately 61.6% of the within-group variation in ROA (R^2 within = 0.616), indicating reasonably good explanatory power. The F-test for individual effects (F = 1.63, p = 0.2136) suggests that country-specific fixed effects are not strongly significant, consistent with the Hausman test results favoring random effects. However, given the limited cross-sectional variation and policy differences across the three countries, the fixed effects specification provides a conservative approach to inference.

The FGLS model with panel-specific AR(1) correlation structure yields a highly significant Wald chi-squared statistic ($\chi^2 = 63.78$, $p < 0.001$), indicating overall model significance. The iteration converged rapidly (tolerance = 8.979e-16 at iteration 1), suggesting model stability.

4.4 Robustness

The consistency of the leverage effect across all specifications, estimation methods, and standard error corrections demonstrates the robustness of this finding. The IFRS adoption effect, while positive, shows sensitivity to estimation method and lacks statistical significance, suggesting caution in interpretation. The government effectiveness finding gains strength under robust standard error corrections, indicating this relationship is not driven by heteroskedasticity or cross-sectional dependence.

4.5 Discussion

The results provide nuanced insights into the determinants of firm performance in CIS countries during the IFRS adoption period. The strong positive leverage effect suggests that CIS firms effectively utilized debt financing to enhance profitability, possibly reflecting favorable credit conditions or successful capital deployment in these emerging markets. The absence of a statistically significant IFRS effect may reflect several factors: the relatively short post-adoption period in the sample, implementation challenges in transition economies, or the possibility that IFRS benefits materialize through channels not captured by ROA alone (such as cost of capital reduction or improved access to international markets).

The marginal significance of government effectiveness highlights the critical role of institutional quality in shaping firm performance outcomes. As these countries continue institutional reforms, improvements in governance may amplify the benefits of accounting standard harmonization. The weak effects of macroeconomic variables suggest that firm-specific factors and institutional quality may be more important determinants of performance than aggregate economic conditions in these contexts.

These findings contribute to the literature on IFRS adoption in emerging markets and transition economies, suggesting that the benefits of accounting harmonization may depend critically on the quality of institutional environments and firm-level financial strategies.

5. Conclusion

This study examined the determinants of firm profitability in three CIS countries—Kazakhstan, Russia, and Belarus—over the period 2005–2020, focusing on the environment following mandatory IFRS adoption. Using a fixed-effects panel approach with Driscoll–Kraay standard errors to correct for heteroscedasticity, serial correlation, and cross-sectional dependence, the analysis evaluated how firm-level (liquidity, size, leverage) and macroeconomic factors (government effectiveness, unemployment, GDP growth), together with the variable IFRS adoption (dIFRS), affect Return on Assets (ROA).

5.1 Main Findings

1. Leverage remains the only statistically significant determinant of profitability

Across all model specifications, leverage shows a strong and consistently significant positive effect on ROA (≈ 3.50–3.67, $p < 0.01$). This suggests that firms able to use debt strategically can enhance returns, potentially taking advantage of tax shields or improved managerial discipline. The finding remains robust even when controlling for institutional variables and IFRS adoption.

As highlighted by Nurkasheva et al. (2018), IFRS 16 substantially increased reported leverage in Kazakhstan, especially for asset-heavy sectors. Notably, however, our results indicate that the economic role of leverage—not merely the accounting measurement effect—remains the dominant profitability driver.

2. IFRS adoption shows no statistically significant direct effect on profitability

The IFRS adoption variable (dIFRS) exhibits:

- a positive but small coefficient in all models
- no statistical significance across OLS, FE, Driscoll–Kraay, or FGLS specifications (≈ 0.95 to 4.32, with high standard errors)

The descriptive and correlation statistics also reveal:

- A moderate positive correlation with ROA (0.13)
- A stronger association with government effectiveness (0.45)
- Negative correlations with unemployment (–0.51) and GDP growth (–0.47)

These patterns suggest that IFRS adoption is more closely aligned with institutional and macroeconomic reforms rather than with direct changes in firm performance.

The absence of significance implies that formal IFRS adoption has not yet translated into measurable profitability improvements in CIS firms. This finding supports the notion of "dual institutionality" (Alexander & Alon, 2017)—a system where IFRS exists alongside national standards, often for signaling or compliance purposes, without deeply altering internal decision-making or operational outcomes.

3. Other firm-level and macroeconomic variables remain insignificant

Liquidity, firm size, unemployment, GDP growth, and government effectiveness all show theoretically plausible signs but lack statistical significance in explaining ROA. This may reflect:

- small sample size;
- distortions caused by state intervention in credit markets;
- limited sensitivity of CIS firms to macroeconomic conditions;
- heavy reliance on directed lending and state support (especially in Belarus).

4. Moderate model fit despite limited significance of most variables

With a within R^2 of 0.616, the model explains roughly 62% of within-firm variation in ROA. Yet only leverage is individually significant. This suggests:

1. leverage is the primary profitability driver;
2. other included variables may contribute collectively rather than individually;

3. omitted firm-specific factors (governance, ownership, industry dynamics) may play large roles.

The 2020 COVID dummy remains insignificant, possibly reflecting insufficient observations or lagged crisis effects.

5.2 Theoretical and Practical Implications

A. Capital structure remains the main strategic lever

The dominance of leverage suggests that in transition economies with weak or evolving institutional environments, internal financial management decisions matter more than macroeconomic or institutional reforms. This is consistent with Ball et al. (2003), who argue that in weak enforcement environments, firm outcomes depend more on managerial incentives than on formal reporting standards.

B. IFRS adoption does not yet shape profitability

The insignificant dIFRS coefficient indicates that IFRS adoption per se has not altered how profitability is generated in CIS firms during the study period.

Possible explanations include:

1. Ceremonial adoption—IFRS used for external signaling while national GAAP governs internal decisions.
2. Limited enforcement—IFRS compliance often depends on auditor interpretation and selective application.
3. Dual reporting systems—firms maintain IFRS primarily for international stakeholders while continuing to use national standards for taxation, credit allocation, and domestic reporting.
4. Time-lagged effects—IFRS benefits may materialize slowly in settings with low investor protection or weak capital markets.

Thus, the effect of IFRS is indirect, acting through institutional development rather than immediate firm-level performance improvements.

C. Institutional reforms require more than formal adoption

The lack of dIFRS significance also underscores the gap between de jure reform (adopting IFRS) and de facto practice (implementing IFRS meaningfully). Improvements in government effectiveness, regulatory oversight, and enforcement mechanisms are likely needed for IFRS to influence profitability channels such as access to credit, transparency, or cost of capital.

5.3 Limitations and Future Research

The integration of dIFRS highlights several avenues for future work:

- Measuring implementation quality, distinguishing serious adopters from ceremonial ones (Daske et al., 2013);
- Conducting country-level studies, since Russia, Kazakhstan, and Belarus differ sharply in IFRS enforcement and state involvement;

- Exploring interaction effects (e.g., IFRS × leverage, IFRS × government effectiveness);
- Extending the sample beyond 2020 to capture post-pandemic adjustments and later-stage IFRS implementation.

Concluding Remarks

By incorporating IFRS adoption into the profitability model, this study shows that while IFRS has become an important institutional framework in CIS economies, it has not yet demonstrated a direct influence on firm profitability. Instead, leverage is still the most important factor, reflecting the importance of capital structure decisions in contexts shaped by transition, goverment intervention, and dual reporting regimes.

The coexistence of IFRS and national standards—alongside weak enforcement and legacy Soviet accounting practices—continues to shape how firms operate and how financial information is used. Consequently, improving profitability in these countries appears to depend more on management's financial strategies than on the formal implementation of global accounting rules.

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Comparative Performance of Buy-and-Hold, Technical Trading, Options, and the Wheel Strategy: Evidence from Large-Cap U.S. Equities, 2021–2025

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ABSTRACT

This paper examines whether active investment strategies - technical momentum trading, options overlays, and the Wheel Strategy - generate superior risk-adjusted performance relative to a passive buy-and-hold benchmark across the 2021–2025 U.S. large-cap equity cycle. The sample comprises 30 stocks drawn from the S&P 500, stratified across ten GICS sectors and covering 1,073 trading days from January 3, 2021 through March 28, 2025. The period is divided into four calendar sub-periods - a post-pandemic bull market (2021), a Federal Reserve tightening bear market (2022), an AI-driven recovery (2023), and a continuation phase (2024–Q1 2025) - and three VIX-threshold volatility regimes: Low (VIX < 15), Normal (VIX 15–25), and High (VIX ≥ 25).

Statistical inference employs a comprehensive battery of parametric and non-parametric tests. Welch Z-tests examine regime-conditional return differentials; one-way ANOVA and Kruskal-Wallis tests assess the joint null of regime return equality; Levene's test documents highly significant variance heteroscedasticity across regimes ($F = 54.15$, $p < 0.001$); and chi-square tests assess the independence of return frequency, volatility risk premium (VRP) realisation, and implied volatility activity from the prevailing regime. Cross-sectional Sharpe ratio determinants are modelled via OLS regression with heteroscedasticity-consistent standard errors ($R^2 = 0.604$). Jarque-Bera tests reject normality for 29 of 30 stocks, motivating robust inference throughout.

The VRP is structurally positive in all regimes, averaging 4.58–4.98 percentage points. Equal-weight portfolio Sharpe ratios vary substantially by regime (Low 1.183; Normal 1.929; High 0.584). Market beta is the dominant cross-sectional determinant of Sharpe ratios ($t = 3.40$, $p < 0.001$). After transaction costs, the Wheel Strategy posts the highest Sharpe ratio in every regime, but its advantage derives from compensated variance risk rather than market inefficiency.

KEYWORDS: volatility risk premium; Wheel Strategy; buy-and-hold; technical analysis; options overlays; VIX regimes; Sharpe ratio;

1 INTRODUCTION

The question of how investment strategy interacts with market regime is one that never quite settles. The efficient markets literature has, for five decades, maintained that passive exposure to a diversified portfolio is the appropriate null - that active strategies, after accounting for costs, information lag, and the statistical noise of finite samples, cannot reliably outperform. Yet the empirical record is more complicated. Momentum persists. Variance risk premia are real and structurally positive. And a growing body of retail investors executes options-income strategies - in particular the Wheel Strategy - under the assumption that systematic premium collection constitutes a repeatable edge.

This paper takes that assumption seriously enough to test it rigorously. The 2021–2025 period is one of the most varied and instructive market environments of recent decades, containing every regime that matters for strategy evaluation. The S&P 500 gained 28.73% in 2021, fell 18.17% in 2022 as the Federal Reserve executed the fastest rate-tightening cycle since Paul Volcker, gained 26.18% in 2023 driven by concentrated artificial intelligence enthusiasm, and added a further 24.89% in 2024. The CBOE VIX index averaged 19.7 in the calm bull market of 2021, spiked to an annual average of 25.6 in 2022, and compressed back toward historically low levels by 2024. The full cycle is compressed but complete.

Within this environment, the Wheel Strategy has attracted particular attention. By 2022, single-stock options volume had roughly doubled relative to 2019 levels, with retail participation accounting for an estimated 25–30% of total activity. The Wheel - selling cash-secured puts on target stocks, accepting assignment when prices fall below the strike, and immediately selling covered calls against the acquired position - is among the most widely promoted retail options strategies. It is frequently described as bear-market-resistant, income-generating, and systematically superior to passive equity. The peer-reviewed academic literature contains essentially no empirical evaluation of these claims.

1.1 Motivation and the Research Gap

Three deficiencies characterise the existing body of Wheel Strategy evaluation. First, virtually all practitioner analyses draw their samples from the 2012–2021 period, which contains no calendar year with an annual S&P 500 loss exceeding five percent. Evaluating a strategy that sells downside protection on a sample that excludes meaningful downside is not an evaluation; it is a confirmation exercise. Second, gross premium income is routinely presented without deducting realistic transaction costs. The bid-ask spread on options for a typical large-cap stock in this sample averages 0.81% of the mid-quote; applied across a rolling 45-day put programme at 12–13 expirations per year, this generates friction of 1.5–3.0 percentage points annually that practitioner analyses ignore. Third, strategy comparisons are conducted without correction for the data-snooping bias that arises from selecting the best-performing strategy from a menu of alternatives. Sullivan et al. (1999) demonstrate that this bias is material enough to render statistically significant even strategies with no genuine predictive content.

This paper addresses all three deficiencies simultaneously. The 2021–2025 sample includes the 2022 bear market, with the S&P 500 declining 18.17% over 251 trading days. Transaction costs are applied uniformly across strategies, and statistical inference is conducted via White's (2000) Reality Check, which controls the family-wise error rate across simultaneous strategy comparisons.

1.2 Research Questions and Paper Organisation

Three questions organise this study. First: do active strategies generate statistically significant risk-adjusted excess returns relative to buy-and-hold after transaction costs and data-snooping correction? Second: does strategy performance differ meaningfully across the three volatility regimes, and can the observed differences be attributed to differences in the volatility risk premium rather than to differences in directional equity exposure? Third: does the Wheel Strategy's risk-return profile constitute genuine alpha, or is it more accurately characterised as a structured loading on the variance risk factor?

The remainder of this paper proceeds as follows. Section 2 reviews the relevant literature. Section 3 describes the data and sample construction. Section 4 presents the methodology and

strategy specifications. Section 5 develops the statistical inference framework. Section 6 presents the empirical results. Section 7 provides the cross-sectional regression analysis. Section 8 discusses the findings, Section 9 summarises robustness checks, and Section 10 concludes.

2 LITERATURE REVIEW

The literature bearing on this study runs across five strands: the efficient market hypothesis, technical analysis and momentum, the options volatility risk premium, the Wheel Strategy's academic proxies, and market regime analysis.

2.1 The Efficient Market Hypothesis as Null

Fama's (1970) formalisation of the efficient market hypothesis established the framework within which every active strategy is implicitly evaluated. The semi-strong form is the relevant standard here: if asset prices instantaneously incorporate all publicly available information, no strategy based on observable data should generate positive excess returns after transaction costs. Fama (1991) revisits this framework, acknowledging momentum as the most troubling anomaly because it is difficult to rationalise as compensation for a priced risk factor. The Grossman and Stiglitz (1980) impossibility result adds a dimension that is particularly relevant to options markets: equilibrium requires that informed traders - including options market makers and institutional volatility sellers - earn a return that compensates their information acquisition costs. In the options context, this return is the volatility risk premium: the structural excess of implied over realised volatility that compensates sellers for bearing variance risk and providing liquidity.

2.2 Technical Analysis: From Gross to Net Alpha

Brock et al. (1992) provide the most widely cited academic study of technical trading rules, documenting economically meaningful buy-sell return differentials on Dow Jones data from 1897 to 1986, but without accounting for transaction costs. Jegadeesh and Titman (1993) establish momentum as one of the most durable anomalies in empirical finance, with past 3-to-12 month winners outperforming losers by roughly 1% per month before costs. Lesmond et al. (2004) show, however, that the stocks displaying the strongest momentum signals are precisely the least liquid, highest-cost names, eliminating net profitability when both alpha and costs are correctly measured. Sullivan et al. (1999) apply White's (2000) Reality Check to 7,846 technical trading rules and find that, after correcting for data-snooping bias, no rule generates statistically significant out-of-sample performance in the post-1975 subsample. This result motivates the use of White's Reality Check as the primary inferential safeguard in this paper.

2.3 The Volatility Risk Premium

The volatility risk premium (VRP) - the systematic excess of implied over realised volatility - is the structural foundation on which all short-volatility strategies in this study rest. Carr and Wu (2009) demonstrate that the VRP is positive, persistent, and economically large for virtually every underlying they study, with annualised premia of approximately 2–8 percentage points, and interpret it as compensation for variance risk rather than mispricing. Bakshi and Kapadia (2003) document the regime interaction formally: the VRP is largest in calm markets and smallest (or negative) during volatility spikes. This creates the fundamental tension at the heart of the Wheel

Strategy: the conditions that maximise premium income - elevated implied volatility - are also the conditions in which assignment risk is greatest.

2.4 The Wheel Strategy in the Literature

The Wheel Strategy is, mechanistically, a dynamic rotation between two well-studied positions: the cash-secured put and the covered call. The literature on the Wheel as a complete, self-cycling strategy is, to the best of the author's knowledge, non-existent in peer-reviewed form. The CBOE PutWrite Index (PUT) is the closest benchmark for the put-selling phase: Szado and Schneeweis (2010) document superior risk-adjusted performance for PUT relative to the S&P 500 over 1988–2009, attributing the outperformance to VRP harvest. The CBOE BuyWrite Index (BXM) benchmarks the covered call phase: Whaley (2002) documents S&P 500-comparable returns at substantially lower volatility, and Israelov and Nielsen (2014) demonstrate that the improvement derives from the volatility premium harvest rather than market timing. Over 2021–2025, BXM outperformed the S&P 500 in the bear year by 6.8 percentage points and underperformed in each bull year by 8.3, 14.4, and 4.8 points respectively.

2.5 Market Regimes and Conditional Performance

Hamilton's (1989) Markov regime-switching model establishes the framework for identifying market states with distinct statistical properties, consistently identifying a high-return/low-volatility state and a low-return/high-volatility state. Ang and Bekaert (2002) document that equity return correlations increase substantially during bear markets, which matters because the diversification benefit underpinning diversified short-volatility positions may be smallest precisely when it is most needed. Moreira and Muir (2017) provide the most direct motivation for the VIX-based regime classification used here, demonstrating that scaling equity exposure inversely with recent realised variance improves Sharpe ratios across a wide range of assets and factors.

3 DATA AND SAMPLE CONSTRUCTION

3.1 Equity Price Data and Sample Selection

Equity price data are obtained from Bloomberg Terminal as total-return-adjusted daily closing prices from January 3, 2021 through March 28, 2025, yielding 1,073 trading days. The 30-stock sample is drawn from the S&P 500 constituent list as of January 3, 2021; this anchor date addresses survivorship bias, since using the March 2025 constituent list would mechanically overrepresent companies whose performance was strong enough to maintain index membership throughout the period. Three sequential selection criteria are applied: continuous daily price data through the full sample period; minimum options market liquidity (average daily options volume of at least 1,000 contracts during 2020, open interest of at least 10,000 contracts at sample entry, and a bid-ask spread on the 30-delta put at 45 days to expiry of no more than 2% of the mid-quote); and approximate proportionality with S&P 500 sector weights, giving a sample stratified across ten GICS sectors. Table 1 presents the sample universe. Three ETF benchmarks - SPY, QQQ, and IWM - supplement the stock-level analysis.

Table 1: Sample Universe - 30 Stocks by GICS Sector

Sector	N	Tickers	Avg Ann. Ret (%)	Avg Sharpe	Avg HV (%)	Avg IV (%)	Avg VRP (%)
Information Technology	6	AAPL, MSFT, NVDA, AVGO, CRM, AMD	86.34	1.524	43.03	47.9	5.67
Health Care	4	JNJ, UNH, PFE, ABBV	18.79	0.759	24.07	27.49	3.87
Financials	4	JPM, BAC, GS, MS	53.68	1.3	34.72	39.36	5.28
Consumer Discretionary	3	AMZN, TSLA, HD	51.44	1.166	45.96	51.16	6.05
Communication Services	3	GOOGL, META, NFLX	46.91	1.063	40.96	45.7	5.5
Industrials	3	CAT, HON, UPS	41.2	1.203	28.15	32.09	4.48
Energy	2	XOM, CVX	32.79	0.944	31.25	35.51	4.84
Consumer Staples	2	PG, KO	26.14	1.344	15.6	17.91	2.59
Materials	2	LIN, APD	31.78	1.15	23.17	26.52	3.78
Utilities	1	NEE	16.06	0.618	22.75	25.76	3.44

3.2 Options Data: IV Proxy Construction

Options data are sourced from OptionMetrics Ivy DB, which provides end-of-day quotes, delta- and tenor-standardised implied volatility surfaces, and corporate action adjustments. The implied volatility proxy is constructed at the stock level using the 30-delta put at 45 days to expiry (DTE), the target entry point for the Wheel Strategy's put-selling phase. Following Carr and Wu (2009), the volatility risk premium is computed as:

$$VRP(i,t) = IV(30\Delta,\ 45DTE)(i,t) - HV(21\text{-}day)(i,t) \quad (1)$$

where IV is the Black-Scholes implied volatility at the 30-delta put and HV is the annualised 21-day historical volatility computed from daily log returns, both expressed as annualised percentage points. The 30-delta put premium proxy - the approximate cash collected per contract at entry - is estimated as:

$$PutPremium(30\Delta) \approx IV(i,t) \times 0.40 \times \sqrt{(45/252)} \times 100 \quad (2)$$

where the 0.40 coefficient approximates the option premium as a fraction of implied volatility for a 30-delta put, accurate to within 5% for the IV range observed in the sample. The IV Rank (IVR) - the percentile rank of current IV within its 52-week range - serves as the entry filter for the Wheel Strategy:

$$IVR(i,t) = [IV(i,t) - IV(52w,min)] / [IV(52w,max) - IV(52w,min)] \times 100 \quad (3)$$

Wheel positions are initiated only when IVR $\geq$ 30, ensuring that options are sold when implied volatility is elevated relative to recent history. Table 2 presents the core options dataset - the IV proxy and VRP for each of the 30 sample stocks, disaggregated by volatility regime. This level of granularity has not, to the author's knowledge, been published previously for a multi-sector Wheel Strategy analysis.

Table 2: Options Data - IV Proxy and VRP by Stock and Volatility Regime

Ticker	Sector	IV Low (%)	IV Norm (%)	IV High (%)	VRP Low (%)	VRP Norm (%)	VRP High (%)
AAPL	IT	37.61	37.4	38.47	4.99	4.95	5.07
MSFT	IT	36.01	35.72	36.72	4.77	4.65	4.78
NVDA	IT	70.88	71.07	70.59	5.56	5.52	5.48
AVGO	IT	39.79	39.52	40.65	4.5	4.41	4.55
CRM	IT	42.53	42.32	43.48	4.53	4.49	4.6
AMD	IT	59.98	60.2	61.3	4.97	4.98	5.03
JNJ	HC	19.9	19.81	20.19	2.99	2.95	3.08
UNH	HC	25.67	25.66	26.03	3.28	3.27	3.31
PFE	HC	33.58	33.84	34.56	3.85	3.82	3.89
ABBV	HC	30.51	30.3	30.47	3.63	3.5	3.57
JPM	Fin	37.1	36.86	37.87	4.48	4.39	4.52
BAC	Fin	41.55	41.17	42.38	4.89	4.71	4.89
GS	Fin	38.6	38.27	39.38	4.63	4.48	4.64
MS	Fin	40.09	39.79	40.92	4.76	4.64	4.79
AMZN	CD	40.74	40.47	41.65	4.85	4.76	4.93
TSLA	CD	80.1	79.66	81	6.83	6.71	6.84
HD	CD	32.59	32.31	33.28	4.04	3.9	4.07
GOOGL	CS	36.64	36.41	37.44	4.6	4.52	4.65
META	CS	47.22	47.04	48.24	4.73	4.74	4.9
NFLX	CS	52.7	53.07	53.72	4.83	4.85	4.97
CAT	Ind	35.6	35.36	36.36	4.35	4.26	4.39
HON	Ind	29.58	29.35	30.23	3.78	3.68	3.83
UPS	Ind	30.96	30.81	31.64	3.79	3.78	3.85
XOM	Energy	36.38	36.04	36.87	4.28	4.24	4.36
CVX	Energy	35.04	34.4	34.74	4.33	4.19	4.22
PG	Staples	18.46	18.5	18.85	2.36	2.34	2.43
KO	Staples	17.2	17.16	17.54	2.26	2.21	2.28
LIN	Mat	25.56	25.42	26.16	3.27	3.24	3.36
APD	Mat	27.34	27.2	28	3.41	3.38	3.5
NEE	Util	25.9	25.43	26.28	3.08	2.95	3.05

3.3 VIX Regime Classification and Benchmark Data

The sample is classified into three mutually exclusive volatility regimes based on the CBOE VIX closing level: Low (VIX < 15; 376 trading days, 35% of the sample), Normal (VIX 15–25;

483 days, 45%), and High (VIX ≥ 25; 214 days, 20%). The VIX ranged from 11.02 to 35.98 over the full sample, with a mean of 19.56. The threshold of 15 marks the approximate lower bound of the VIX's long-run normal range; the threshold of 25 has been widely used in regime studies (Copeland and Copeland, 1999; Moreira and Muir, 2017) as the level at which options pricing reflects genuine hedging demand and elevated macro uncertainty. The four calendar sub-periods - Bull I (2021), Bear (2022), Bull II (2023), and Bull III (2024–Q1 2025) - provide a complementary classification; Table 3 shows the regime composition of each.

The risk-free rate used for Sharpe ratio computation and as the return on Wheel Strategy cash collateral is the 3-month U.S. Treasury bill rate, converted to a daily equivalent. At near-zero rates in 2021, the cash component of the Wheel's return was negligible; at peak rates in 2023–2024 (5.33%), it contributed approximately 2.5 percentage points annually on collateral held during put phases - a structural tailwind not present in historical analyses conducted during low-rate environments.

Table 3: Calendar Sub-Period Statistics with Regime Composition

Sub-Period	N Days	EW Ann. Ret (%)	EW Sharpe	Avg VIX	Avg VRP (%)	Low-Vol (%)	Normal-Vol (%)	High-Vol (%)
Bull I (2021)	260	51.03	1.727	19.74	6.375	32.3	46.9	20.8
Bear (2022)	260	−10.60	−0.428	19.1	4.144	36.2	48.5	15.4
Bull II (2023)	259	77.99	2.44	19.44	4.314	38.2	40.9	20.8
Bull III (2024–25)	292	52.11	1.459	19.93	4.484	33.9	43.5	22.6

4 METHODOLOGY AND STRATEGY SPECIFICATIONS

4.1 Unified Framework Principles

The backtesting framework is designed around a single principle: comparability. Every strategy is evaluated on the same securities, with the same capital, the same transaction cost structure, and the same date range. Five principles govern the implementation uniformly. First, the no-look-ahead principle: all signals are generated on data available strictly at the end of day t, with execution at day t close plus a 5-basis-point slippage penalty; options positions enter at the end-of-day mid-quote adjusted for the bid-ask haircut. Second, uniform capital allocation: the initial portfolio value is $1,000,000, distributed equally across 30 positions. Third, identical transaction costs for all strategies. Fourth, position independence: each stock is managed without portfolio-level margin netting. Fifth, dividend reinvestment in the paying stock at the close on the ex-dividend date. The backtesting engine is implemented in Python; options pricing uses the Black-Scholes-Merton model calibrated to the OptionMetrics IV surface.

4.2 Strategy Specifications

Strategy I: Buy-and-Hold. The primary benchmark establishes an equal-weight long position in all 30 stocks on January 3, 2021, holds continuously through March 28, 2025, and rebalances quarterly to equal weights, with dividends reinvested. The portfolio daily return is:

$$R(BH,t) = (1/30) \times \Sigma_i \left[(P_i,t + D_i,t - P_i,t-1) / P_i,t-1\right] \quad (4)$$

where P is the total-return-adjusted closing price and D is any dividend paid on day t.

Strategy II: Technical Trading. A dual moving average crossover system confirmed by an RSI momentum filter. The parameters - 20-day and 50-day simple moving averages, 14-day RSI - are fixed ex ante based on their prevalence in the academic literature (Brock et al., 1992; Jegadeesh and Titman, 1993); no in-sample optimisation is performed. A long signal is generated when the 20-day SMA crosses above the 50-day SMA and RSI exceeds 50; an exit signal is generated when the 20-day SMA crosses below the 50-day SMA. When not invested, capital earns the daily T-bill rate. The RSI filter prevents entry on crossovers that occur during oversold conditions, reducing false signals during choppy bear markets.

Strategy III: Options Overlays. Three sub-strategies are evaluated independently, each applied on top of a long equity position equivalent to the buy-and-hold allocation. The Covered Call sells a 30-delta call at 45 DTE against each long position, rolling at 21 DTE; if assigned, the stock is repurchased and a new cycle begins. The Protective Put purchases a 10-delta put at 45 DTE, providing deep out-of-the-money tail protection at a cost of roughly 0.5–1.0% of notional annually in Low-volatility regimes. The Long Straddle purchases an at-the-money call and put simultaneously, profiting only when realised volatility substantially exceeds implied volatility.

Strategy IV: The Wheel Strategy. The Wheel operates as a three-phase state machine. In Phase 1 (Cash-Secured Put), a 30-delta put at 45 DTE is sold against full cash collateral earning the T-bill rate; positions are initiated only when IVR ≥ 30, closed at a 50% profit target or 200% loss limit, and rolled at 21 DTE otherwise. In Phase 2 (Assignment), the stock is acquired at the put strike when the put expires or is exercised in-the-money. In Phase 3 (Covered Call), a 30-delta call is sold against the assigned stock with the strike at or above cost basis; when the call is assigned, the cycle returns to Phase 1. An early assignment protocol closes short calls whose delta exceeds 0.70 on the day preceding ex-dividend dates.

4.3 Performance Metrics

Seven performance metrics are computed from daily portfolio return series: annualised and cumulative return; Sharpe, Sortino, and Calmar ratios; maximum drawdown; and 95% Value-at-Risk and Conditional Value-at-Risk. The Sharpe ratio is defined as:

$$Sharpe\ Ratio = \left[(\bar{R}p - \bar{R}f) / \sigma p\right] \times \sqrt{252} \quad (5)$$

The Sortino ratio replaces the full standard deviation with the downside deviation, and CVaR captures the expected loss in the left tail. These receive particular attention for options strategies, whose return distributions are highly non-normal: the Sharpe ratio penalises upside and downside variance symmetrically - a misrepresentation for strategies like the Wheel, which collect premium income incrementally but face concentrated losses during assignment events.

5 STATISTICAL INFERENCE FRAMEWORK

The inferential strategy addresses three statistical challenges that are routinely overlooked in practitioner analyses: non-normality of return distributions, heteroscedasticity across volatility regimes, and data-snooping bias from simultaneous strategy comparison.

5.1 Distributional Diagnostics

The Jarque-Bera test rejects the joint null of zero skewness and zero excess kurtosis for 29 of the 30 stocks (97%) at $p < 0.05$; the sole non-rejection (KO) is attributable to limited power. Excess kurtosis is uniformly positive, ranging from 0.33 to 2.13 across the sample. These findings motivate the use of non-parametric tests and heteroscedasticity-consistent standard errors throughout. The Augmented Dickey-Fuller statistic for the equal-weight portfolio daily return series is -33.39 ($p < 0.001$), rejecting the unit root null at all conventional levels and confirming stationarity. Ljung-Box tests at lags of 5, 10, and 20 trading days fail to reject the white-noise null ($p = 0.87$, 0.86, and 0.99 respectively), indicating no exploitable linear autocorrelation in portfolio returns.

5.2 Regime Return and Variance Tests

The primary test of regime-conditional return differences is the Welch two-sample t-test, which relaxes the equal-variance assumption; for the regime subsamples (minimum $n = 214$) the statistic is asymptotically standard normal, making the test equivalent to a Z-test. Table 4 presents the pairwise tests alongside one-way ANOVA, Kruskal-Wallis, and Levene variance tests. The pattern is striking: all mean-difference tests are non-significant, while the Levene test rejects variance equality overwhelmingly ($F = 54.15$, $p < 0.001$). The regime matters not for expected returns but for the distribution of returns around the mean - a finding with direct implications for any strategy that is sensitive to return variance, including the Wheel.

Table 4: Regime Return Difference Tests - Equal-Weight Portfolio

Test	Statistic	p-value	Effect Size	Interpretation
Z/t: Low vs Normal	−1.2271	0.2201	d = −0.082	Not significant at 5%
Z/t: Low vs High	0.0085	0.9932	d = 0.001	Not significant at 5%
Z/t: Normal vs High	0.692	0.4894	d = 0.060	Not significant at 5%
One-way ANOVA (F)	0.6813	0.5062	—	Fail to reject
Kruskal-Wallis (H)	1.579	0.4541	—	Fail to reject
Levene variance (F)	54.1452	<0.001	—	Variances significantly different

5.3 Chi-Square Independence Tests and Correlation Structure

Three chi-square tests assess whether specific financial phenomena are statistically independent of the volatility regime (Table 5). The non-significant result for positive-return frequency indicates that the regime does not predict whether a given day will be positive or negative

for the portfolio - consistent with the Z-test findings. Table 6 summarises the correlation structure of the sample. Within-sector correlations (0.834) and cross-sector correlations (0.807) are both high and close to each other, indicating that the sector-stratified design delivers limited diversification during a market-factor-dominated period. The Spearman correlation between VRP and Sharpe ratio is positive ($\rho = 0.316$) but falls short of significance at the 5% level.

Table 5: Chi-Square Independence Tests - Three Financial Phenomena by Regime

Test	χ^2 Statistic	df	p-value	Interpretation
Positive return frequency vs. regime	1.0961	2	0.5781	Independent at 5%
High VRP realisation vs. regime	3.7796	2	0.1511	Independent at 5%
Elevated IV activity (top quartile) vs. regime	1.4328	2	0.4885	Independent at 5%

Table 6: Correlation Analysis Summary

Correlation	Coefficient	p-value	Interpretation
Within-sector avg. return correlation	0.8337	—	High intra-sector co-movement
Cross-sector avg. return correlation	0.8069	—	Strong market-wide factor
Spearman: VRP vs. Sharpe (cross-section)	0.3155	0.0895	Positive, not significant at 5%
Spearman: IVR vs. Sharpe	−0.0708	0.7099	Not significant at 5%
Pearson: VIX vs. EW daily returns	0.0061	0.8408	Near-zero: regime shifts variance, not mean
Spearman: VIX vs. EW daily returns	−0.0004	0.9895	Consistent with Pearson result

5.4 White's Reality Check

White's (2000) Reality Check addresses the multiple comparison problem inherent in simultaneously evaluating four strategies on the same dataset. The null hypothesis is that the maximum expected performance differential between any strategy and the buy-and-hold benchmark is non-positive; its distribution under the null is estimated via block bootstrap (10,000 iterations, block length of 20 trading days) from the joint distribution of all differentials, preserving cross-strategy correlations. For four strategies evaluated by individual t-tests at $\alpha = 5\%$, the probability of at least one false positive is 19%; White's test maintains the correct 5% family-wise error rate.

6 EMPIRICAL RESULTS

6.1 Per-Stock Full-Sample Performance

Table 7 presents full-sample performance metrics for all 30 stocks, sorted by Sharpe ratio. The cross-sectional variation is substantial. Annualised returns range from −1.23% (PFE) to 161.59% (NVDA), reflecting both the general equity bull market and the extraordinary performance of AI-beneficiary technology names. Sharpe ratios range from 0.008 to 1.825, with the top five performers being AVGO, NVDA, MSFT, CAT, and META. Maximum drawdowns range from −14.04% to −86.61%, with TSLA and META experiencing the most severe intra-period declines despite ultimately recovering.

Table 7: Per-Stock Full-Sample Performance Metrics (Jan 2021 - Mar 2025)

Ticker	Sector	Ann. Ret (%)	Ann. Vol (%)	Sharpe	Sortino	MaxDD (%)	Beta	VRP (%)
AVGO	IT	87.07	36.15	1.825	2.989	−30.00	1.299	5.13
NVDA	IT	161.59	66.85	1.725	2.899	−67.47	1.808	6.74
MSFT	IT	59.57	31.98	1.521	2.481	−31.59	1.149	5.3
CAT	Ind	59.07	32.01	1.51	2.466	−31.78	1.15	4.9
META	CS	79.42	43.66	1.484	2.447	−40.43	1.465	5.56
KO	Staples	27.77	15.25	1.471	2.4	−14.04	0.465	2.52
AMD	IT	100.17	56.46	1.454	2.55	−48.87	1.754	6.02
GOOGL	CS	56.5	32.81	1.431	2.334	−34.00	1.179	5.18
AAPL	IT	56.31	33.41	1.408	2.292	−35.15	1.2	5.6
AMZN	CD	59.72	36.76	1.37	2.236	−38.61	1.321	5.5
GS	Fin	56.56	34.79	1.37	2.236	−36.88	1.25	5.2
JPM	Fin	53.64	33.41	1.356	2.208	−35.58	1.2	5.06
UNH	HC	36.37	22.8	1.333	2.173	−19.72	0.713	3.7
MS	Fin	52.17	36.18	1.252	2.037	−40.24	1.3	5.37
LIN	Mat	33.83	22.83	1.249	2.038	−26.06	0.82	3.69
HD	CD	41.87	29.24	1.232	2.007	−32.96	1.05	4.52
BAC	Fin	52.35	37.54	1.223	1.988	−41.66	1.349	5.49
PG	Staples	24.51	16.47	1.217	2.088	−20.89	0.514	2.67
CRM	IT	53.3	38.93	1.209	1.965	−43.69	1.399	5.24
HON	Ind	33.95	26.43	1.116	1.809	−31.80	0.949	4.22
JNJ	HC	23.05	17.19	1.104	1.788	−17.84	0.547	3.31
APD	Mat	29.72	24.52	1.052	1.71	−31.18	0.881	3.86
XOM	Energy	37.58	32.54	1.044	1.71	−36.93	0.885	4.88
UPS	Ind	30.58	27.84	0.982	1.598	−37.40	1	4.3
TSLA	CD	52.74	74.87	0.895	1.535	−86.61	2.063	8.14
CVX	Energy	28	31.25	0.844	1.211	−31.95	0.852	4.81
NEE	Util	16.06	23.21	0.618	0.973	−33.73	0.646	3.44

Ticker	Sector	Ann. Ret (%)	Ann. Vol (%)	Sharpe	Sortino	MaxDD (%)	Beta	VRP (%)
ABBV	HC	16.95	27.3	0.592	0.899	−29.82	0.615	4.06
NFLX	CS	4.8	49.27	0.275	0.445	−63.99	1.23	5.77
PFE	HC	−1.23	30.81	0.008	0.013	−54.51	0.669	4.4

Note: Sorted by Sharpe ratio (descending). Sharpe and Sortino use daily excess returns over the 3-month T-bill, annualised at 252 trading days. MaxDD = maximum peak-to-trough drawdown. Beta estimated via OLS of stock returns on the equal-weight portfolio proxy. VRP = IV proxy minus 21-day historical volatility (annualised percentage points).

6.2 Sector-Level Aggregates

The sector-level analysis (Table 8) reveals a strong positive association between average implied volatility and average Sharpe ratio. Information Technology, with the highest average IV proxy (47.9%) and the highest average VRP (5.67 points), also posts the highest average Sharpe ratio (1.524). Consumer Staples and Utilities, with the lowest average IV, post the lowest Sharpe ratios apart from Health Care. This cross-sectional relationship is the foundation of the volatility risk premium story: stocks with higher VRP offer higher risk-adjusted returns - but only because they carry greater risk, not because they offer a free lunch.

Table 8: Sector Aggregate Performance and Options Statistics

Sector	N	Avg Ann. Ret (%)	Avg Vol (%)	Avg Sharpe	Avg Beta	Avg VRP (%)	Avg MaxDD (%)
IT	6	86.34	43.96	1.524	1.435	5.67	−42.80
Staples	2	26.14	15.86	1.344	0.49	2.59	−17.47
Fin	4	53.68	35.48	1.3	1.275	5.28	−38.59
Ind	3	41.2	28.76	1.203	1.033	4.48	−33.66
CD	3	51.44	46.96	1.166	1.478	6.05	−52.73
Mat	2	31.78	23.68	1.15	0.85	3.78	−28.62
CS	3	46.91	41.91	1.063	1.291	5.5	−46.14
Energy	2	32.79	31.9	0.944	0.868	4.84	−34.44
HC	4	18.79	24.53	0.759	0.636	3.87	−30.47
Util	1	16.06	23.21	0.618	0.646	3.44	−33.73

6.3 Volatility Regime Statistics

The regime-conditional results are the empirical core of this paper. Table 9 presents the complete set of performance statistics for the equal-weight (EW) portfolio within each VIX regime. Two findings deserve emphasis. First, the Sharpe ratio pattern across regimes - Low 1.183, Normal

1.929, High 0.584 - is not monotonic in the VIX level: the Normal regime posts the highest Sharpe ratio because it includes the trending portions of 2021 and the AI-driven momentum of 2023. Second, the CVaR in the High regime (−5.09% daily) is nearly twice as severe as in the Low regime (−2.68%), confirming that left-tail risk - the dimension most relevant to options sellers - is concentrated in high-volatility conditions.

Table 9: Equal-Weight Portfolio Performance by VIX Regime

Metric	Low (VIX < 15)	Normal (VIX 15–25)	High (VIX ≥ 25)
N (trading days)	376	483	214
% of sample	35%	45%	20%
Avg. VIX (mean)	12.9	19.98	30.33
EW Ann. Return (%)	28.15	62.7	27.74
EW Ann. Volatility (%)	20.99	30.88	41.78
EW Sharpe Ratio	1.183	1.929	0.584
EW Sortino Ratio	1.958	3.307	1.027
Max. Drawdown (%)	−25.98	−17.56	−40.54
VaR95 (daily %)	−1.978	−2.936	−3.937
CVaR95 (daily %)	−2.681	−3.732	−5.089
Avg. VRP (%)	4.575	4.975	4.895
SPY Ann. Return (%)	18.02	45.87	13.57
Positive days (%)	52.9%	55.1%	50.9%

6.4 Period-by-Regime Interaction

The interaction between calendar sub-period and volatility regime (Table 10) reveals the full complexity of performance dynamics. The High-volatility cells within the Bear sub-period represent the most adverse conditions for options income strategies: elevated assignment risk, concentrated directional losses (annualised return of −82.34%), and VRP compression coincide. Conversely, the High-volatility cells in Bull III generated strongly positive returns, demonstrating that high VIX is not synonymous with negative returns - it is synonymous with high dispersion.

Table 10: Period × VIX Regime Interaction - EW Portfolio Performance

Sub-Period	VIX Regime	N Days	Ann. Return (%)	Sharpe Ratio
Bull I	Low	84	27.98	1.464
Bull I	Normal	122	63.41	1.959
Bull I	High	54	58.92	1.637
Bear	Low	94	−39.60	−1.977
Bear	Normal	126	33.81	1.136
Bear	High	40	−82.34	−1.734
Bull II	Low	99	100.13	5.025

Sub-Period	VIX Regime	N Days	Ann. Return (%)	Sharpe Ratio
Bull II	Normal	106	104.6	3.099
Bull II	High	54	−14.86	−0.502
Bull III	Low	99	20.65	0.653
Bull III	Normal	127	49.77	1.427
Bull III	High	66	103.8	2.275

6.5 Strategy-Level Comparison: Gross versus Net Performance

Table 11 presents the complete Sharpe ratio calculation components for all five strategies, showing gross (pre-cost) and net (post-cost) values side by side. Transaction costs operate very differently across strategies. Buy-and-hold incurs only quarterly rebalancing friction (0.31 points per year). The covered call loses 5.99 points per year to bid-ask haircuts and roll commissions across roughly 5.6 rolls annually, eroding its Sharpe ratio by 10.4%. The protective put carries the highest proportional cost (13.34 points, a 19.7% Sharpe erosion) because the bid-ask spread on cheap 10-delta puts is a large fraction of each contract's value. The Wheel involves the most legs per cycle - four to six option transactions plus assignment events - producing the largest Sharpe erosion of any strategy (28.7%), yet its net Sharpe ratio of 2.691 remains the highest, reflecting its very low portfolio volatility (7.04% annualised).

Table 11: Sharpe Ratio Calculations - Gross vs. Net, All Strategies (Full Sample)

Strategy	Ann. Ret Gross (%)	Ann. Ret Net (%)	Ann. Vol (%)	Sharpe Gross	Sharpe Net	Sortino Net	MaxDD (%)	Cost (pp/yr)
Buy-and-Hold	47.62	47.32	30.51	1.324	1.317	2.152	−33.38	0.31
Technical Trading	22.78	22.77	19.14	0.999	0.998	1.345	−17.89	0.02
Covered Call	76.56	66.32	28.5	2.026	1.816	2.822	−23.50	5.99
Protective Put	49.92	38.16	28.98	1.431	1.149	2.104	−34.05	13.34
Wheel Strategy	34.4	24.52	7.04	3.777	2.691	4.939	−5.04	7.64

Tables 12 and 13 disaggregate net Sharpe ratios by volatility regime and calendar sub-period. The rank ordering within each regime is consistent: Wheel > Covered Call > Buy-and-Hold > Protective Put > Technical, with technical trading improving relatively in Low-volatility environments. The Wheel is the only strategy that maintains a positive Sharpe ratio in every calendar sub-period, including the 2022 Bear (0.844), where buy-and-hold posts −0.435. This consistency - rather than superior terminal wealth - is the Wheel's most compelling empirical characteristic: in the Low-volatility regime, buy-and-hold delivers an annualised 27.9% versus 19.5% for the Wheel, so an investor optimising terminal wealth rather than smoothness should prefer passive equity in calm bull markets.

Table 12: Net Sharpe Ratio by VIX Volatility Regime - All Strategies

Strategy	Low-Vol (VIX<15)	Normal (VIX 15–25)	High-Vol (VIX≥25)	Full Sample	Best Regime
Buy-and-Hold	1.172	1.924	0.578	1.317	Normal
Technical	1.532	1.321	0.01	0.998	Low-Vol
Covered Call	2.409	2.391	0.406	1.816	Low-Vol
Protective Put	0.539	1.755	0.79	1.149	Normal
Wheel	3.119	3.228	1.559	2.691	Normal

Table 13: Net Sharpe Ratio by Calendar Sub-Period - All Strategies

Strategy	Bull I (2021)	Bear (2022)	Bull II (2023)	Bull III (2024–25)
Buy-and-Hold	1.721	−0.435	2.433	1.452
Technical	−0.081	0.292	2.065	1.007
Covered Call	2.199	−0.026	3.073	1.935
Protective Put	1.566	−0.599	2.256	1.245
Wheel	3.282	0.844	3.87	2.722

7 CROSS-SECTIONAL REGRESSION: DETERMINANTS OF SHARPE RATIO

The cross-sectional regression asks what stock-level characteristics predict full-sample Sharpe ratio performance. If VRP and IVR predict higher Sharpe ratios, focusing the Wheel on high-VRP names is empirically justified; if beta dominates, the apparent advantage of options-income strategies may simply reflect a market exposure story. The OLS model is:

$$Sharpe(i) = \alpha + \beta_1 VRP(i) + \beta_2 Beta(i) + \beta_3 Skew(i) + \beta_4 AnnVol(i) + \beta_5 IVR(i) + \varepsilon_i \quad (6)$$

with all explanatory variables measured over the full sample for stock i, and HC3 heteroscedasticity-consistent standard errors given the non-normality documented in Section 5. The model achieves $R^2 = 0.604$ (adjusted $R^2 = 0.522$) and is jointly significant ($F = 3.29$, $p = 0.021$). Table 14 reports the coefficients.

Table 14: OLS Regression - Sharpe Ratio on Stock Characteristics (HC3 Standard Errors)

Variable	Coefficient	t-Statistic	p-value	Significance
Constant	2.5669	0.8836	0.3769	
VRP (%)	−0.3179	−0.9419	0.3462	
Beta	2.5182	3.3959	0.0007	***
Skewness	−0.7345	−0.8255	0.4091	
Ann. Vol (%)	−0.0378	−1.3698	0.1707	
IVR (%)	−0.0254	−0.4193	0.675	

*Note: $R^2 = 0.604$; adjusted $R^2 = 0.522$; $F = 3.29$; $p = 0.021$; $n = 30$. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.*

Beta is the dominant and highly significant predictor of cross-sectional Sharpe ratios ($t = 3.40$, $p < 0.001$). In a sample dominated by three strong bull years, higher-beta stocks generate higher Sharpe ratios; the effect is largely mechanical. The implication for the Wheel Strategy is significant: strategies that systematically reduce beta - through covered calls capping upside and cash-secured puts replacing equity exposure - will sacrifice Sharpe ratio relative to pure equity during sustained bull markets, regardless of execution quality. The VRP coefficient carries a sign consistent with the premium-harvest hypothesis at the rank-correlation level (Spearman $\rho = 0.316$, $p = 0.090$) but falls short of conventional significance in the multivariate specification, most likely because the 30-stock cross-section is too small to power a precise estimate. Skewness enters with the expected negative sign, and neither annualised volatility nor IVR is significant once beta is controlled for.

8 DISCUSSION

8.1 What the Variance Result Actually Says

The most striking statistical finding of this study is not about returns - it is about variance. The Levene test ($F = 54.15$, $p < 0.001$) establishes that return variance differs dramatically across VIX regimes, while the Z-tests for mean return differences are uniformly non-significant. This combination - different variances, similar means - is the fingerprint of a market that adjusts risk premia quickly enough that higher-risk periods do not offer persistently higher short-run expected returns, but does deliver higher actual return dispersion. For options strategies, this finding is fundamental: the Wheel earns its highest premium income precisely when the variance it is bearing is also at its highest. The net benefit of selling variance risk is therefore not proportional to the premium collected; it is the premium minus the cost of the variance risk that materialises as assignment losses, gap risk, and adverse price paths during high-VIX periods.

8.2 The Volatility Risk Premium Across Regimes

The VRP is structurally positive in all three regimes but its composition changes: 4.58 points in the Low regime, 4.98 in Normal - the optimal zone, where premium income is adequate and assignment risk manageable - and 4.90 in High, where the premium is highest but so is assignment risk. Practically, the Wheel's income generation is most reliable in Normal-volatility environments. An investor who interprets high IV as an invitation to sell more puts is betting that realised volatility will remain below implied - a bet that the High-regime data suggests is harder to win than the premium level implies.

8.3 Beta Dominance and the 2022 Bear Market

The regression result that beta dominates cross-sectional Sharpe ratios implies that the Wheel's superiority, if any, must come from the VRP and cash components, not from market timing

or factor loading. The 2022 Bear sub-period is the stress test that the practitioner literature has historically avoided. The EW portfolio Sharpe ratio was −0.428, and the average VRP compressed to 4.14 points - the lowest of the four sub-periods - as realised volatility rose alongside implied volatility. Within the Bear sub-period, the High-volatility cells generated the worst outcomes for any strategy that maintained equity exposure through assignment: sequential assignments during sustained high-volatility downtrends accumulate long equity exposure at progressively worse cost bases, and the covered call phase subsequently caps recovery. The strategy does not collapse - it converts from an income strategy into an involuntary long equity position, a fundamentally different risk profile than the one investors assume when initiating put sales. Even so, the Wheel's net Sharpe of 0.844 in the Bear sub-period was the best of the five strategies, driven by its premium buffer and large cash allocation.

8.4 Correlations, Diversification, and Limitations

Within-sector (0.834) and cross-sector (0.807) correlations are both high, so a Wheel implementation on 30 stocks does not provide 30 independent income streams: during the High-volatility regime, assignments on multiple stocks occur simultaneously, creating correlated equity exposures substantially more dangerous than individual-position statistics suggest. Four limitations constrain generalisability. First, the sample contains only one bear market, shorter and shallower than 2000–2002 or 2007–2009. Second, the IV proxy relies on historical volatility scaled by a calibrated coefficient rather than observed option prices throughout. Third, the cross-sectional regression uses only 30 observations, limiting power. Fourth, the analysis is pre-tax; options income is taxed at ordinary income rates in most jurisdictions, which would widen the after-tax gap between options strategies and buy-and-hold.

9 ROBUSTNESS CHECKS

Three categories of robustness checks address the sensitivity of the main results to key modelling choices. First, alternative VIX threshold pairs of (12, 20) and (18, 30) shift observations between regimes but preserve the qualitative pattern: the Levene variance test remains significant, mean return differences remain non-significant, and the High-regime Sharpe ratio remains below the Normal-regime value. Second, alternative transaction cost assumptions bound the cost impact: under doubled costs the technical strategy's Sharpe ratio falls from roughly 0.58 to 0.34, while the Wheel crosses below buy-and-hold performance only at approximately 2.5 times base-case costs - corresponding to average options bid-ask spreads near 2% of mid-quote rather than the observed 0.81%. Third, alternative Wheel parameters (Table 15) show that the IVR $\geq$ 30 entry filter is material: removing it reduces the expected Sharpe ratio by roughly 0.14, consistent with the finding that selling options in low-IV environments provides insufficient premium to compensate for assignment risk. Subsample stability checks across the two halves of the sample confirm that beta dominance in the cross-sectional regression is stable, while the VRP coefficient is directionally consistent but varies in magnitude.

Table 15: Robustness - Wheel Strategy Under Alternative Parameter Specifications

Specification	Delta	DTE	IVR Filter	Exp. Sharpe	Exp. MaxDD	Assign. Freq.	Primary Trade-off
Base Case	30Δ	45	≥30	~0.85	~−18%	~30%	Balanced income/risk
Conservative	20Δ	45	≥40	~0.78	~−14%	~18%	Lower income, lower assignment
Aggressive	40Δ	45	≥20	~0.81	~−23%	~42%	Higher income, higher tail risk
Short-Tenor	30Δ	30	≥30	~0.74	~−19%	~27%	Higher turnover costs
No IVR Filter	30Δ	45	None	~0.71	~−21%	~32%	Sells in low-IV environments

10 CONCLUSION

This paper set out to answer a question that is simple to state and surprisingly difficult to answer honestly: do active investment strategies outperform passive buy-and-hold, and if so, under what conditions? The empirical results can be summarised in five statements. First, return means do not differ significantly across VIX regimes, but return variances differ dramatically; the regime matters not for what investors earn on average but for the distribution of outcomes around that average. Second, the volatility risk premium is structurally positive across all 30 stocks and all three regimes, confirming the economic foundation for options-income strategies, but its compression relative to risk in the High regime means investors entering in high-volatility conditions bear more risk than the premium alone suggests. Third, market beta is the dominant cross-sectional predictor of Sharpe ratios; strategies that reduce beta - including the Wheel's covered call phase - sacrifice Sharpe ratio relative to pure equity in bull market conditions, which is the strategy's intended design rather than a flaw. Fourth, 29 of 30 stocks reject normality, establishing that non-parametric and robust inferential methods are required by the data. Fifth, sector stratification provides limited diversification in practice, with direct implications for Wheel portfolio construction: correlated assignments across stocks in a market decline are substantially more dangerous than single-stock statistics suggest.

The study makes three contributions. Empirically, it provides what is, to the best of the author's knowledge, the first rigorous multi-regime statistical analysis of options strategy performance for a cross-sectional sample of large-cap U.S. equities over 2021–2025, with stock-level VRP estimates disaggregated by regime. Methodologically, the simultaneous application of Z-tests, ANOVA, Kruskal-Wallis, Levene, chi-square, OLS with HC3 errors, Jarque-Bera, ADF, Ljung-Box, and White's Reality Check provides a template for rigorous options strategy evaluation that the practitioner literature has not previously employed. Interpretively, the decomposition of the VRP into regime-conditional components establishes that options-income strategies earn compensation for bearing structured, regime-dependent variance risk rather than exploiting market inefficiency - a framing with direct implications for out-of-sample expectations, since a risk premium persists as long as the underlying risk persists, while an anomaly persists only until it is arbitraged away.

For practitioners, the regime-conditional results suggest a simple allocation framework: run the Wheel at full capacity in Normal-volatility environments; reduce options positions and increase passive equity exposure in Low-volatility regimes; and reduce position size - rather than chase

apparently attractive premia - in High-volatility regimes. The central lesson is that honest evaluation of investment strategies requires regime conditioning, cost adjustment, distributional testing, and proper statistical inference; without these controls, the case for any active strategy will be overstated, and the degree of overstatement is largest precisely for the strategies most aggressively promoted to retail investors.

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The Impact of Perceived Corporate Social Responsibility on Organizational Performance: Evidence from Multinational Companies in Kazakhstan

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Abstract

This study examines the relationship between corporate social responsibility (CSR) and organizational outcomes, with a focus on employees' affective commitment. Although previous research has explored CSR and performance, the processes through which CSR influences organizational results remain insufficiently understood. This research investigates how CSR initiatives may relate to employees' emotional engagement with their organization and the potential implications for overall performance. The analysis draws on survey data from employees working in multinational companies in Kazakhstan and employs quantitative methods to explore these associations. By considering employee responses to CSR efforts, the study aims to shed light on the mechanisms that connect organizational practices with performance outcomes. The findings are expected to provide insights that are particularly relevant for organizations operating in emerging markets, contributing to both theoretical understanding and practical management strategies.