

## Capital budgeting decisions and risk management of firms in the United Arab Emirates

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**Abstract:** *This paper investigates the risk management factors that affect the capital budgeting decisions of firms in the United Arab Emirates. Primary data were collected from questionnaires sent to a sample of 150 firms (101 responded, a response rate of 67.3%). Correlation analysis assessed the relationships between the risk management factors and capital budgeting. Six risk management factors (keep good financial records; profitability index; number of employees; diversified portfolios; finance manager's years of experience; and sound financial forecasts) were found to have significant relationships to capital budgeting. Two risk management factors (adequate insurance, and asset value of the company) were found to have no such significant relationship. JEL codes: G31, M1, M4*

**Keywords:** *Capital budgeting, risk management, decision making, correlation analysis, United Arab Emirates*

### 1. Introduction

When preparing budgets for capital projects, managers have to strategically balance the risks involved if they are to earn required returns. According to Singh, Jain, & Yadav (2012), a capital budget is a plan for investing in long-term assets, such as buildings, machinery, bridges, and stadiums. Capital budgeting decisions involve determining potential long-term investment projects that require significant funds. Risk management tries to ensure that the incomes from such projects are high enough to justify the investments.

To minimize an investment's exposure to risks, managers engage in practices such as diversifying their portfolios and using sound forecasting techniques. Risk perception reflects the decision maker's interpretation of the likelihood of risk exposure; it is the decision maker's risk inherent in a particular situation. Thus, among other things, risk management may be affected by the risk attitude and risk perception of business decision makers (Brookfield, 1995).

In the view of Souder and Bromiley (2012), capital budgeting should be undertaken with due care and after critical analysis, since it involves resource allocations that anticipate future cash outflows and inflows which if not properly analyzed could lead to substantial financial loss for the company. Typically, capital budgeting consists of moving from a capital project or equipment

request to evaluation, selection, and implementation, with review during and at the end of each step (Keeler, Fleming, & Allport, 2014), while risk management encompasses measures to mitigate risk exposure or limit the risks in particular projects (Rad, 2016). By mitigating risk in capital budgeting, companies can minimize losses. Thus risk management and capital budgeting can improve an organization's ability to create and sustain superior performance (Bennouna, Geoffrey, & Marchant, 2010; Keeler, Fleming, & Allport, 2014).

Risk in capital budgeting has three levels: the project's stand-alone risk, its contribution-to-firm risk, and systematic risk. Stand-alone risk measures a project's potential without factoring in the potential risk that it adds to the company's assets and other projects. Contribution-to-firm risk measures the project's potential effect on other projects and assets. Systematic risk assesses the project's effects on the organization as a whole (Keller, 2014; Li & Wu, 2009). Typically, the analytical methods used for risk analysis in capital budgeting include sensitivity analysis, scenario analysis, simulation analysis, correlation analysis, and decision trees.

In the United Arab Emirates (UAE) as in other parts of the world, businesses undertake capital projects after carefully analyzing the potential risks involved and taking adequate measures to reduce them. This paper investigates how companies in the United Arab Emirates make capital budgeting decisions in the context of risk management. This study focuses on stand-alone risk. Data were collected from UAE companies and correlations were analyzed to investigate the impacts of risk management factors on capital budgeting. The remainder of this paper is organized as follows: Section 2 summarizes background about the UAE. Section 3 presents a literature review on capital budgeting. Section 4 discusses this study's methodology. Section 5 discusses the results and analysis, while Section 6 succinctly concludes the paper.

## 2. Background

The UAE is in the eastern part of the Arabian Peninsula and covers part of the Gulf of Oman and the southern coast of the Persian Gulf (World Bank, 2016). The country is comprised of seven emirates (Abu Dhabi, Dubai, Sharjah, Ajman, Umm Al Quwain, Fujairah, and Ras Al Khaimah) and achieved its formal independence as a federal state on December 2, 1971. The UAE is bordered by Saudi Arabia to the west and south, Qatar to the north, and Oman to the east (please see Table 1 for selected basic information about the UAE). The country is the world's eighth largest oil producer and maintains a free market economy (UNdata, 2016). Despite the impact of the 2009 financial crisis and the 2015 fall in oil prices, the country's economy has been resilient, maintaining an estimated real GDP growth rate of 2.7% in 2016 (World Bank, 2016). The UAE is one of the world's fastest growing tourism destinations, and it accounts for 0.5% of global tourism. Tourism contributed 5.2% to the country's GDP in 2016 (World Travel & Tourism Council, 2017). According to the World Bank (2016), the recent global capital flows into the UAE suggest that the country is attracting international investments into a variety of asset classes. In fact, sovereign and private investors from around the world are attracted to real estate, upstream oil and gas projects, and other infrastructure projects. The question is: what risk management factors are considered by companies when investing in the UAE?

### 3. Literature review

Capital investment decisions have received increased research attention over the past few decades with a focus on firms of different sizes, in various industries, and in various countries (Bennouna, Geoffrey, & Allport, 2010; Pike, 2005; Dutta & Fan, 2012). Some studies focused on firms of local dimensions, while others concerned multi-national corporations (MNC).

While some studies have focused on investment decisions and financial theory (e.g., Brookfield, 1995; Drury & Tayles, 1997; and Arnold & Hatzopoulos, 2000), other studies have focused on behavioral aspects of capital budgeting (Berry, 1984; Pike, 2005). Most of these studies indicate an increase in the use of sophisticated capital budgeting techniques in developed countries. However, little research has been devoted to capital budgeting in less developed countries.

Using data from a survey of 32 manufacturing and trading companies listed on the Colombo Stock Exchange, Nurullah & Kengatharan (2015) investigated capital budgeting of companies in Sri Lanka. The study revealed that net present value (NPV) was the most preferred capital budgeting method, followed closely by the payback (PB) method and the internal rate of return (IRR). Sensitivity analysis was the dominant tool for incorporating risk in capital budgeting.

Singh, Jain, and Yadav (2012) examined the capital budgeting of companies in India. Using responses from a questionnaire of 166 nonfinancial companies, data were collected from the period 2001-2011. The study found that sophisticated techniques and sound capital budgeting were common among Indian firms. All respondent firms used discounted cash flow (DCF) techniques. IRR was used by more than three quarters of the sample companies, while NPV was used by half. Real options were also used by half.

In a study of capital investment in the United States, Souder and Bromiley (2012) found that firms with profits below expected levels were more risk-averse. The study also concluded that rather than undertaking long-term capital investment, the firms lobbied either to induce the government to reduce regulations or to frame other companies as anti-competitive to increase their own short-term profits.

|   |  |
|---|--|
| Language  | Arabic is the official language. But Persian, English, Hindi and Urdu are also commonly spoken |
| Independence:   | December 2, 1971   |
| Administrative Capital                                | Abu Dhabi  |
| Largest City  | Dubai (2 million in population)  |
| Population  | 9.27million (2016 estimate)  |
| Population growth rate                                | 2.47% (2016 estimate)  |
| Unemployment rate                                     | 3.8% (2014 estimate)   |
| Literacy (% of population Age 15+)                    | 94 (2015 estimate)   |
| Poverty (% of population below national poverty line) | 19.5 (2003 estimate)   |
| GDP   | 667.2 billion US\$ (2016 estimate)   |
| GDP growth rate                                       | 2.7% (2016 estimate)   |
| Inflation rate  | 3.4% (2016)  |
| Telephones (fixed lines)                              | 2.28 million (2016 estimate)   |
| Telephones (mobile cellular):                         | 19.9 million (2016 estimate)   |
| Internet users  | 5.374 million (2016 estimate)  |
| Infant mortality                                      | 10.3 (2015 estimate)   |
| Maternal mortality rate (per 100,000 live births)     | 6 (2015 estimate)  |
| Life expectancy at birth (years)                      | 77.5 (2015 estimate)   |
| Health expenditures (percent of GDP)                  | 2.6% (2014 estimate)   |
| Hospital bed density (per1,000 population)            | 1.1 (2012 estimate)  |

Table 1. United Arab Emirates: Selected recent basic information.

*Source:* UNICEF, 2016 ([www.unicef.org](http://www.unicef.org)); World Bank, 2016 (<http://data.worldbank.org>)

*Note:* Number in parentheses indicates year.

Similarly, Arnold and Hatzopoulos (2000) analyzed the extent to which the most significant UK corporations were employing modern investment appraisal techniques. Using responses from 96 structured questionnaires which were sent to finance directors of the sample

companies, they found that UK companies increasingly used discounted cash flow methods and formal risk analysis techniques when investing in capital.

Finally, Dutta and Fan (2012) analyzed conditions in which centralized and decentralized capital budgeting work best. For projects where the manager needed innovation, decentralization was more effective if incentive contracts were in place to share the profits created by individuals. But for projects requiring limited innovation from management, centralization worked better.

#### **4. Methodology**

This study examines the interplay between risk management and capital budgeting decisions in the UAE. Specifically, it investigates how risk management factors affect the manager's intention to undertake capital projects. A total of 150 questionnaires were sent to representatives of companies in the UAE (please see Appendix for the questionnaire). Of the 150 questionnaires, 101 were accurately completed and returned (a response rate of 67.3%). The questionnaires measured risk management in capital budgeting. The risk factors were represented on a scale of 1 to 5, with 1 being "Not important" and 5 being "Extremely important." Respondents were selected based on their financial decision-making capabilities in the companies. Most were finance controllers, budget directors, etc. The population sample consists of companies from the manufacturing and construction sectors. The data were collected between April 2014 and November 2015. A sample questionnaire is in the appendix.

#### **5. Results and Analysis**

Table 2 presents the factors and their definitions, while Table 3 presents the Pearson correlation matrix of the various factors. Pearson correlation provides the most common approach for capturing the linear relationships between variables. The correlation is positive if both variables move in the same direction and negative if they move in opposite directions. A t-test assessed whether correlations differed from zero at the 5% level of statistical significance. Six factors significantly correlated with capital budgeting decisions (CBD): FNR (0.393), PRI (0.294), EMP (0.253), DVP (0.233), EFM (0.162), and SFC (0.108). Table 2 identifies the abbreviations.

FNR indicates good financial record-keeping by the companies. FNR serves as a proxy for a good accounting system which records and tracks all transactions in any capital project. It serves as a control system to ensure that the budgets for capital investments are not overspent. Consequently, companies are more likely to invest in capital projects that generate positive cash flows if they have an accounting system ensuring that all financial records are properly managed.

| <b>Factor</b> | <b>Definition</b>                     |
|---------------|---------------------------------------|
| CBD           | Capital Budgeting Decisions           |
| FNR           | Keep good financial records           |
| DVP           | Diversified Portfolios                |
| AIN           | Adequate Insurance                    |
| SFC           | Sound Financial Forecasts             |
| PRI           | Profitability Index                   |
| EMP           | Number of Employees                   |
| EFM           | Finance Manager's Years of Experience |
| ASV           | Asset Value of Company                |

Table 2. List of factors.

PRI represents the profitability index associated with a capital project. It can be a proxy for discounted cash flow methods used in capital budgeting analysis, such as NPV and IRR. The more likely that a capital project will earn a profit, the higher the possibility that the project will be selected by decision-makers.

EMP represents the number of employees in a company. Its positive correlation with capital budgeting decisions suggests that companies with more employees are more likely to undertake capital projects because they have the staff needed to complete the project, assuming that the workers have the needed skills.

Another factor that correlates positively with CBD is DVP, which measures the degree to which the company maintains a diversified portfolio of capital projects. Portfolio diversification is a necessary condition for mitigating risks in all areas of investments, and companies in the study tend to diversify their portfolios in terms of capital projects. For example, a company may build roads and bridges, while it may also have the expertise to design and construct sewage systems or to procure heavy machinery.

EFM represents the number of years of experience of the finance managers in capital budgeting. Its positive correlation with capital budgeting suggests that finance managers with more years of experience are more competent in capital investment. As with any skill, years of experience positively correlate with a person's competence. The analysis suggests that among finance managers, more years of experience contribute to better capital investment, and vice versa.

The term SFC indicates the use of sound financial forecasts. It may serve as a proxy for quantitative risk analysis techniques (such as sensitivity analysis, scenario analysis, Monte Carlo simulation, and decision tree analysis). As would be expected, companies carry out sound financial analysis and forecasts of capital projects to determine potential risks and returns before investing. By using sound financial forecasts, companies are more likely to make better capital investment decisions.

|     | EMP    | FNR    | DVP    | AIN    | SFC    | PRI    | CBD   | ASV   | EFM   |
|-----|--------|--------|--------|--------|--------|--------|-------|-------|-------|
| EMP | 1      | 0.098  | 0.158  | -0.083 | -0.058 | 0.053  | .253  | .808  | .272  |
| FNR | .098   | 1      | .430   | .260   | -.135  | -.084  | .393  | -.004 | .125  |
| DVP | .158   | .430   | 1      | .035   | .141   | .041   | .233  | .124  | .208  |
| AIN | -.083  | .260   | .035   | 1      | .021   | .207   | .096  | -.063 | .026  |
| SFC | -.058  | -.135  | .141   | .021   | 1      | .595   | -.108 | .102  | -.053 |
| PRI | .053   | -.084  | .041   | .207   | .595   | 1      | -.094 | .138  | -.055 |
| CBD | .253** | .393** | .233** | .096   | .108*  | .294** | 1     | .116  | .162* |
| ASV | .808   | -.004  | .124   | -.063  | .012   | .138   | .116  | 1     | .113  |
| EFM | .272   | .125   | .208   | .026   | -.053  | -.055  | .162  | .113  | 1     |

Table 3. Pearson correlation matrix.

\*Correlation is significant at the 0.05 level (2-tailed).

\*\*Correlation is significant at the 0.01 level (2-tailed).

Finally, two factors, asset value of the company (ASV) and adequate insurance (AIN) did not make the 5 percent level of significance, so they might not affect capital budgeting of companies that were not in the sample. One would have expected that companies with larger assets would be more likely to invest in capital projects, but surprisingly this study did not find such a relationship. Perhaps firms with larger asset value had already invested heavily in their most valuable projects and consequently had fewer incentives to invest in more projects. Additionally, adequate insurance coverage did not affect the decisions of the companies when considering capital projects.

## 6. Conclusion

This study investigates risk management factors that affect the capital budgeting of UAE firms. Using field data from a sample of 101 firms, the study used Pearson correlation analysis to test the relationships between the risk management factors and capital budgeting decisions. The risk management factors found to be statistically significant are: keeping good financial records (FNR), the profitability index (PRI), the number of employees (EMP), a diversified portfolio (DVP), the finance manager's years of experience (EFM), and sound financial forecasts (SFC). In contrast, there was no significant relationship between capital budgeting and either adequate insurance (AIN) or the asset value of the company (ASV). As capital investments require substantial upfront costs, companies need to be assured that the potential to earn significant returns on such investments exists. The value of incorporating risk management factors into capital budgeting is to highlight their impact on project success. Most previous studies of capital budgeting have found that risk factors are significant determinants of return on investments. The results of this study confirm that the information contained in the capital budgeting process does significantly capture risk factors. For transitional economies such as Kazakhstan and other CIS countries, this study suggests that risk mitigation strategies in capital budgeting are more likely to improve the performance of capital projects.

The findings of this study are limited by the fact that the data do not include other sectors besides manufacturing and construction. Future studies should include data from all sectors of the

economy, including banking and energy. Another limitation is that the study is confined to one country (UAE). Since UAE is a member of the Gulf Cooperation Council (GCC) countries, future research should be undertaken to enlarge the sample size by including other GCC countries. In addition, similar studies should be done in any of the GCC countries and a comparative analysis performed. Despite these limitations, this research adds to the body of knowledge on capital budgeting in general, and in the UAE context in particular by identifying the most important risk management factors considered during the capital budgeting process.

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## 7. Summary

*English:* This study investigates the risk factors used by firms in the UAE in their capital budgeting decision. Six risk factors (keep financial records; profitability index; number of employees; diversified portfolios; finance manager's years of experience; and sound financial forecasts) were identified to significantly affect the capital budgeting process. The findings suggest that firms in the UAE and transitional economies such as Kazakhstan are more likely to have a higher return on investments when these risk factors are considered when making capital budgeting decisions.

*Russian:* В этом исследовании исследуются факторы риска, используемые фирмами в ОАЭ при принятии решения о составлении бюджета капитала. Шесть факторов риска (ведение финансовой отчетности; индекс прибыльности; численность работников; диверсифицированные портфели; многолетний опыт финансового менеджера и надежные финансовые прогнозы) были определены, чтобы оказать существенное влияние на процесс составления бюджета капитала. Полученные данные свидетельствуют о том, что фирмы в ОАЭ и странах с переходной экономикой, таких как Казахстан, с большей вероятностью получают более высокую отдачу от инвестиций, если учитывать эти факторы риска при принятии решений по бюджетированию капитала.

*Kazakh:* Бул зерттеу БАӘ фирмаларының капиталды жоспарлау шешимінде қолданатын қаржы факторларын зерттеді. Капиталдың бюджетін қалыптастыру процесіне айтарлықтай әсер ететін алты қаржы факторы (қаржылық есепті жүргізу; табыстылық индексі; қызметкерлер саны; әртараптандырылған портфельдер; қаржы менеджерінің көпжылдық тәжірибесі және дұрыс қаржылық болжамдар) анықталды. Дәлелдемелер БАӘ және Қазақстан сияқты өтпелі экономикадағы фирмалар капиталды бюджетке салу туралы шешім қабылдаған кезде осы қаржы факторларын ескерілген кезде инвестіциялардан жоғары пайда табады деп болжады.

## 8. References

- Arnold, G., & Hatzopoulos, P. (2000). The theory-practice gap in capital budgeting: Evidence from the United Kingdom. *Journal of Business Finance & Accounting*, 26(5/6), 603-626.
- Bennouna, K., Geoffrey, M., & Marchant, T. (2010). Improved capital budgeting decision process: Evidence from Canada. *Management Decision*, 48(2), 225-247.
- Berry, A. (1984). The control of capital investment. *Journal of Management Studies*, 21(1), 61-81.
- Brookfield, D. (1995). Risk and capital budgeting: avoiding the pitfalls in using NPV when risk arises. *Management Decision*, 33(8), 56-59.
- Drury, C., & Tayles, M. (1997). The misapplication of capital investment techniques. *Management Decision*, 35(2), 86-93.
- Dutta, S., & Fan, Q. (2012). Incentives for innovation and centralized versus delegated capital budgeting. *Journal of Accounting and Economics*, 53, 592–611.
- Kerler III, W. Fleming, A., & Allport, C. (2014). How framed information and justification impact capital budgeting decisions. In Marc J. Epstein and John Lee (eds.) *Advances in Management Accounting* (pp. 181-210). New York, NY: Emerald Publishing.
- Li, X., & Wu, Z. (2009). Corporate risk management and investment decisions. *The Journal of Risk Finance*, 10(2), 155-168.
- Nurullah, M., & Kengatharan, L. (2015). Capital budgeting practices: Evidence from Sri Lanka. *Journal of Advances in Management Research*, 12(1), 55-82.
- Pike, R. (2005). Capital investment decision making: Some results from studying entrepreneurial businesses. *Accounting and Business Research*, 35(4), 352-353.
- Rad, A. (2016). Risk management-control system interplay: Case studies of two banks. *Journal of Accounting and Organizational Change*, 12(4), 522-546.
- Singh, S., Jain, P., & Yadav, S. (2012). Capital budgeting decisions: Evidence from India. *Journal of Advances in Management Research*, 9(1), 96-112.
- Souder, D., & Bromiley, P. (2012). Explaining temporal orientation: Evidence from the durability of firms' capital investments. *Strategic Management Journal*, 33, 550–569.
- United Nations, UNdata (2016). United Arab Emirates. In *World statistics pocket book*. New York: United Nations.

United Nations International Children's Emergency Fund (unicef) (2016). United Arab Emirates. Retrieved from <https://www.unicef.org/infobycountry/uae.html>

World Bank (2016). UAE: Data and statistics. Retrieved from <https://data.worldbank.org/country/united-arab-emirates>

World Travel and Tourism Council (2017). Travel and tourism: Economic impact, United Arab Emirates. Retrieved from <http://www.wttc.org>

## 9. Appendix A Survey Questionnaire

**Please respond to the following items**

1. Your age in years \_\_\_\_\_
2. Your gender    Male \_\_\_\_\_ Female \_\_\_\_\_
3. Your nationality UAE \_\_\_\_\_ Non-UAE \_\_\_\_\_
4. Your marital status:  
       \_\_\_\_\_ Single \_\_\_\_\_ Married \_\_\_\_\_ Divorced \_\_\_\_\_ Widow
5. Your highest educational level  
       \_\_\_\_\_ Below Bachelor degree \_\_\_\_\_ Bachelor degree  
       \_\_\_\_\_ Graduate Diploma \_\_\_\_\_ Master Degree  
       \_\_\_\_\_ Doctoral Degree
6. Your position in the company  
       \_\_\_\_\_ Financial Controller  
       \_\_\_\_\_ Financial Manager  
       \_\_\_\_\_ Senior Accountant  
       \_\_\_\_\_ Financial Analyst  
       \_\_\_\_\_ Budget director  
       \_\_\_\_\_ Accountant
7. How long have you been in your current position?  
       1= 1-5 years  
       2 = 5-10 years  
       3 = 10-15 years  
       4 = 15-20 years  
       5 = more than 20 years

## 8. Industry of your company:

1 = banking

2 = manufacturing

3 = engineering/construction

4 = other

## 9. Number of employees working in your company:

1= 1-50

2 = 50-100

3 = 100-150

4 = 150-200

5 = more than 200

## 10. Total Assets of your company (USD):

1= less than \$1 million

2 = from \$2-\$5 million

3 = from \$5-\$10million

4 = from \$10-\$15million

5 = more than \$15 million

## 11. Please indicate by checking the appropriate column to identify the various activities used in risk management strategies in your company.

|   | <b>NOT<br/>IMPORTANT</b> | <b>SOMEWHAT<br/>IMPORTANT</b> | <b>NEUTRAL</b> | <b>VERY<br/>IMPORTANT</b> | <b>EXTREMELY<br/>IMPORTANT</b> |
|---|--------------------------|-------------------------------|----------------|---------------------------|--------------------------------|
|   | <b>1</b>                 | <b>2</b>                      | <b>3</b>       | <b>4</b>                  | <b>5</b>                       |
| 1) Maintaining adequate financial records   |                          |                               |                |                           |                                |
| 2) Maintaining diversified investment portfolio regularly                               |                          |                               |                |                           |                                |
| 3) Maintaining adequate insurance coverage  |                          |                               |                |                           |                                |
| 4) Maintaining sound forecasting techniques   |                          |                               |                |                           |                                |
| 5) Conducting profitability index to determine which project will provide highest value |                          |                               |                |                           |                                |