

# CAPITAL BUDGETING PRACTICES: THE CASE OF QATAR

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## ABSTRACT

*The purpose of this project was to investigate the capital budgeting practice in the largest firms in Qatar. A survey was conducted of the 170 largest firms and corporations. A total of 55 completed surveys were received, for a response rate of 34 percent. The results showed that Qatari companies in general tend to adopt the discounted cash flow methods, with Net Present Value (NPV), Profitability Index (PI) and the Internal Rate of Return (IRR) being the most widely used methods. Capital asset Pricing Model (CAPM) including some extra "risk factors" was used to estimate the cost of capital in more than half of the companies. Companies tend to use the cost of debt plus some premium as the discount rate, and they frequently reviewed and adjusted that rate, mainly as to the expected changes in the project's risk. The terminal value was commonly estimated using the present value of future cash flow in perpetuity and multiples of terminal earnings.*

## 1. INTRODUCTION

Entities, individuals and organizations, make large variety of investments. The objective is to return a value that is larger than the investment cost. Investing ranges between real assets such as property, land or machinery, and financial assets such as bonds and stocks. (Ross, Westerfield, & Jaffe, 2002). Qatar is a fast developing Arabian country, with current population of more than 1.5 million <sup>(1)</sup>. It also represents the third largest natural gas reserve in the world.

(1) As published on 31 January 2009. Qatar Statistics Authority started, through its electronic website, presenting Qatar total population figures on monthly basis. This shows population at the end of each calendar month.

It also have long beaches on the Arabian gulf in mid way between Kuwait, Bahrain and Saudi Arabia sea ports in the north, and United Arab Emirates to its south-east. Its large natural reserves of gas and oil, had lead to the speed up its development stage, with huge amounts of domestic and foreign investments. The fast rate of projects and its huge investments necessitate that businesses should apply sound financial planning and investing procedures and execution procedures.

The purpose of this study is to investigate the capital budgeting practices applied by the financial executives in the large firms and corporations in Qatar. This includes

the techniques used to evaluate the various investments and/or projects opportunities, the methods used to determine the cost of capital, the discount rate used in the Discounted Cash Flow (DCF) methods, and the span of planning mostly used in determining the cash flow and its terminal value.

The paper is organized as follows: section 2 reviews theoretical background and literature relevant to the study. Section three describes methodology and sample, the survey questionnaire, survey sample, and survey process. Section 4 provides the survey results and statistical analysis. Finally, section 5 concludes the paper.

## II. THEORETICAL BACKGROUND AND LITERATURE REVIEW

The literature often uses terms such as The financial markets have two features that enable the investors make the right investment decisions. Firstly, the financial markets are used as a standard of comparison against which any investment project must be measured. Finally they can serve as a tool to help the entity undertake investments. (Ross, Westerfield, & Jaffe, 2002)

Corporate finance and Managerial accounting textbooks have extensively described the decision making techniques that help the management evaluates the investment opportunities and give the basis upon which to choose either to invest or not, or to choose one or more choices in which to invest. These techniques are referred to as capital budgeting techniques. We quote here a simple yet informative definition from Wikipedia:

Capital budgeting (or investment appraisal) is the planning process used to determine whether a firm's long term investments such as new machinery, replacement machinery, new plants, new products, and research development projects are worth pursuing. It is budget for major capital, or investment. (Wikipedia the free Encyclopedia)

### 1. Capital Budgeting Techniques

Finance textbooks describe two main methods to evaluate the projects. The first method uses the discounted cash flows (DCF) or the incremental cash flows of the investment or project. The techniques that are based on this method are Net Present Value (NPV), the Internal Rate of Return (IRR), Discounted Payback period, Modified Internal Rate of Return and Profitability Index. Other references include other techniques, the Equivalent annuity method and the chain method, which are also using the NPV in their calculations. (Wikipedia the free Encyclopedia)

The second method is based on the accounting rules and uses the projects returns and profits. This method, though not preferred by economists, finance professionals and management accountants, is still used by some organizations and investors. The accounting rate of return (ARR) and the Payback Period are grouped under this category.

Real options analysis methods gained more importance since 1970s. Harvey (1999) described the real options rules, and showed how to apply it to capital budgeting. He explains:

The topic of real options applies the option valuation techniques to capital budgeting

exercises in which a project is coupled with a put or call option. For example, the firm may have the option to abandon a project during its life. This amounts to a put option on the remaining cash flows associated with the project. Ignoring the value of these real options (as in standard discounted cash flow techniques) can lead to incorrect investment evaluation decisions. (Harvey, 1999)

Additionally, there are some techniques applied to reduce or eliminate the sense of unsecured judgment built on a proposal with DCF techniques used to project the cash flows. Ross, Westerfield, & Jaffe (2002) described in their Corporate Finance textbook three approaches including sensitivity analysis, the scenario analysis and break-even analysis.

The sensitivity analysis is also known as what-if analysis and bop (best, optimistic, pessimistic) analysis. It is used to test how the NPV of a particular project is sensitive to changes in the underlying assumptions and factors, such as the factors involved in projecting the revenues and estimating the variable and fixed costs. While here only one factor is changed at a time, the scenario analysis examines a number of different scenarios, where each scenario involves more than one factor that has influence on the project. Finally the break-even analysis determines the amount of sales needed to break even. (Ross, Westerfield, & Jaffe, 2002)

Bragg (2007) points out the importance of constrained resource approach in capital budgeting and the decision making. This approach is different from the traditional management technique of local optimization, where all company operations are to be made

as efficient as possible, with machines and employees maximizing their work efforts at all times. According to Bragg, the key difference between the two methodologies is the view of efficiency. The constraints-based approach holds that any local optimization of a non-constraint resource will simply allow it to produce more than the constrained operation can handle, which results in excess inventory.

That adds on the factors affecting the decision making process to approve investments that needs relatively large amount of capital. Eljelly & AbuIdris (2001) investigated some factors that affected both the public and the private sectors in Sudan. The factors include the size of the investment, its cost, its expected age, its productive capacity, the urgency of the project, quality required, familiarity with similar investments, political factors, social factors, risk avoidance, availability of foreign currency and other factors.

Many researchers had investigated the gap between the theory and practice of financial management in the developed countries, developing economies and Less Developed Countries (LDC). Most of those old and recent studies have been conducted using questionnaire instruments, such as Pike (1996) in UK; Alhumoud and Ibrahim (1997) in Qatar; Graham and Harvey (2001) in USA; Eljelly & AbuIdris (2001) in Sudan; Lazaridis (2004) in Cyprus; Truong, Partington, & Peat (2008) in Australia; Chazi, Terra & Zanella (2007) in Bahrain, Kuwait, Oman & United Arab Emirates; Dedi & Orsag (2007) in Croatia and Cohen & Yagil (2007) had done a multinational survey that covered five countries – the US, the UK, Germany, Canada and Japan. Some of these studies had revised previous studies

in the same country, while other represents the first studies in the surveyed country.

There are some limitations towards the comparison of an old study with new one, even in the same country. The new research should use similar questions, with similar analysis methods and based on similar population profile. There is a wide range in regards to the response rates of questionnaire-based studies. A review of the most recent and related studies that investigated the investment evaluation techniques is included in the next pages.

Pike (1996) had surveyed 129 firms in the UK, with 78.1 percent response rate. He presented his 1992 survey results as a part of a longitudinal study over a 17-year period. As for the financial evaluation, it was virtually a standard procedure for all firms. He had found the payback method used in 94 percent of the companies. Also he observed that a steady growth toward using DCF methods with the IRR technique leading with 81% percent followed by NPV (74%). He suggested that the increase use of computer spreadsheets is the most likely explanation for this increase assisted with an increased awareness of the time-value of money in decision making. The ARR was still used (50%). In general, most of the companies relied on more than one technique.

Alhamoud and Ibrahim (1997) had surveyed all 29 publicly owned Qatari companies at that time. Twenty-four companies participated in the survey. The study found that the payback method was the most widely used method (64.2%) followed by the IRR (58%), profitability index (37.5%), NPV (20.8%) and the Accounting Rate of Return

(8.3%). Although DCF methods found to be used mainly in the manufacturing sector, no significant difference was found among the different sectors regarding using one method over another.

In Sudan, Eljelly & AbuIdris (2001) surveyed both public and private sectors. They found that both sectors used capital budgeting techniques, but there is significant percentage of public enterprises that do not apply capital budgeting techniques in evaluating the investment opportunity they plan to undertake. Also they found that the most used method was the payback, followed by the IRR among the private sector companies and the NPV among the public corporations.

Graham and Harvey (2001) had conducted one of the most comprehensive surveys that describe the practice of corporate finance. They sample a large cross-section of approximately 4,400 US firms. They received 392 responses from the chief financial officers, representing a response rate of 9 percent. Regarding the evaluation techniques, Graham and Harvey surveyed several techniques, more than the techniques usually investigated. They found that internal rate of return was used the most (75.61%), followed by net present value (74.93%), payback period (56.74%), hurdle rate (56.94%), sensitivity analysis (51.54%), earnings multiple approach (38.92%), discounted payback period (29.45%), real options (26.59%), accounting rate of return (20.29%), value-at-risk or other simulation analysis (13.66%), adjusted present value (10.78%), and finally the profitability index (11.87%). These findings reflect the development of management accounting practices in US companies and a high level

of awareness of its importance in the field. In another study targeted the Fortune 1000, the capital budgeting techniques frequently or sometimes used were found the following percentages; the NPV ranked first (96%), IRR followed with (92.1%). The payback method ranked third as (74.5%), discounted payback (56.7%), profitability index (43.9%), and ARR still used with (33.3%). Finally, the Modified Internal Rate of Return (MIRR) with percentage of 21.9. (Patricia & Glenn, 2002)

Lazaridis (2004) surveyed 100 selected firms in Cyprus with response rate of 56 percent. He found that 54.43 percent of projects' evaluation is done using simple techniques, and 18.99% of the firms did not use any evaluation methods. This can be attributed to the following stated factors; lack of familiarity with these methods (50%), while 33.33 percent do not believe that such methods could change their profits substantially. Others claim that they do not have the staff, time and experience or that there are no available services suited for formally evaluating investment projects at their enterprises' size. Similar to findings of Eljelly & AbuIdris (2001), Lazaridis found that the payback period method is the most used with 36.71%. Net present Value ranked second with 11.39%, IRR (8.86%), ARR (3.8%), and the last rank was for Profitability index (2.59%).

## **2. Determination of the Cost of Capital and Discount Rate**

Graham and Harvey (2001) found that the Capital Asset Pricing Model (CAPM) is by far the most popular method in the US (73.5%). This similar to Truong, Partington, & Peat (2008) finding in Australia with 72%. While Chazi, Terra & Zanella (2007)

found that 57.1 percent of publically listed corporations in four gulf countries are using the CAPM. There are other alternatives to estimate the cost of capital. We mention some of the most investigated methods, and also used in our survey, including CAPM and some extra risk factors, using the average historical returns on common stock, and a dividend discount model.

Many researchers studied the different methods used in practice to estimate the cost of capital and to choose the appropriate discount rate to be used in DCF methods. The weighted average cost of capital was widely used as the discount rate in capital budgeting methods while the CAPM was the most popular to estimate the cost of capital. (Truong, Partington, & Peat, 2008)

In regards to a particular investment opportunity, the discount rate used by companies in practice are; the firm's discount rate, discount rates of companies in similar business, cost of debt plus some premium, financing rate (e.g. borrowing rates), discount rate representative of a related industry, previous experience or the discount rate of the division involved in that project. (Truong, Partington, & Peat, 2008)

## **III. METHODOLOGY AND SAMPLE**

To construct the survey sample, a sample of the 43 listed corporations in Qatar Exchange was used. The focus of this survey was the capital budgeting practices of large corporations; therefore all companies included in the list of companies with capital equals or exceeds 10 Millions Qatari Riyals (\$1 = 3.65 QAR) was added, in which the total number of companies

was 525. The list was obtained from Qatar Chamber of Commerce and Industry. This method of classification was the only one valid for classifying the firms in terms of registered capital. Due to the limited time for concluding the study, the list was reduced to include companies with published email and full contact information. That led to 170 companies.

Companies' addresses and contact information were obtained from either Qatar Exchange, Qatar Chamber of Commerce and Industry report list, or Qatar Business Directory 2008/2009. A few companies listed their finance executive or financial manager names and direct contact number and email.

Questionnaire potential respondents were offered the opportunity to obtain the results of the survey as an incentive to complete the instrument. Respondents were assured their response were anonymously and confidential. The survey questionnaire was also made available on the World Wide Web, through the following link: <http://www.surveygizmo.com/s/76856/practice-of-capital-budgeting-techniques-in-firms-in-qatar>. Respondents could choose to reply using the Internet, (either filling the questionnaire directly on the website or by filling the survey in the MS Word) or delivering the questionnaire by fax or by hand.

The survey questionnaire (See Appendices A & B) was composed of 24 questions, some of which were open-ended. This study relied on Graham & Harvey (2001), Chazi, Terra, & Zanella (2007) and Truong, Partington, & Peat (2008) in parts of the questionnaire, with minor changes recommended from CFOs contacted at the beginning of the

project to accommodate companies in Qatar. The final questionnaire and invitation letters to participate in the survey were distributed in mid of December 2008. Follow up letters were distributed in mid of January and first of February 2009. This provided a total of 55 responses. In addition, 5 companies replied stating that it was not their policy to participate in surveys. Thirty letters were returned undelivered due to either error in the email address or over quota in destination email box. The overall response rate was 32.35 percent, which is generally consistent with surveys conducted overseas. Alhamoud and Ibrahim (1997) obtained 24 responses from 29 companies, a response rate of 82.75%. This project is different than their study in many ways, such as timing of this study, with Qatar being more developed and the challenges of the "butterfly effect" of global financial crisis, the sample profile, size and responses, as well as the scope of the study. This study focused on the techniques used in evaluating investments and projects in 170 companies, while they studied the practice of management accounting in only 29 companies.

## IV. RESULTS AND STATISTICAL ANALYSIS

After collecting the completed questionnaires, all data were entered into an Excel spreadsheet, and then statistical analysis was performed using SAS. In the following sub sections, the survey results and findings will be discussed.

### 1. Demographic Statistics

Table 1 presents the respondents demographics in terms of age group, gender and nationality group. Panel A shows that the majority of respondents were in their

thirties and above (72.73%). Of the total respondents, 38.18 percent were belonging to the group of 30 to 40 years while younger than 30 years group represented only 27.27 percent. That may indicate that the majority of respondents were experienced in their fields. Panel B shows that the majority of the respondents were males with 74.55 percent, while females only represented 25.45 percent. That may indicate that the positions related to top management, finance and management accounting are dominated by males. On the other hand, Panel C shows that these positions are mainly held by expats. The non-Qatari respondents represented 87.27 percent vs. 12.73 percent Qatari nationals.

such as CPA. There were 25.45 percent of the respondents holding high school and undergraduate degrees. Regarding the time spent with the firm, Panel B shows that 14.55 percent of respondents have spent more than 10 years with their current firms, 9.09 percent spent between six to ten years, 50.91 percent spent between 2 to 5 years and finally 25.45 percent spent less than two years. More than one third of the respondents have top managerial positions such as CEO, CFO, Director of Finance, Controller and Treasurer (35.85%). Other respondents held relevant senior positions such as Corporate Accountant, Group Accountant and Chief Account. Responses for these positions represented 33.96 percent. The remaining

**Table 1: Respondents' demographics**

	Frequency	Percent
<b><u>Panel A- Age groups</u></b>		
Less than 30 years	15	27.27%
30 – 40	21	38.18%
41- 50	15	27.27%
51- 60	3	5.45%
More than 60 years	1	1.82%
<b><u>Panel B- Responses by gender</u></b>		
Male	41	74.55%
Female	14	25.45%
<b><u>Panel C- Respondents' nationality</u></b>		
Qatari	7	12.73%
Non-Qatari	48	87.27%

The respondents' education level, time spent with the company and the position held are shown in Table 2. Interestingly, 41.82 percent of respondents have MBA, 9.09 percent earned Non-MBA Masters, 1.82% with more than Masters Degree (e.g. PhD) and 21.82% with other degrees and certificates

held positions such as Manager of Corporate Development, Corporate Planning, Project Manager and others.

**Table 2: Respondents' education level, time spent with the company and the position held**

	Frequency	Percent
<b><u>Panel A- Respondents' education level</u></b>		
High School	5	9.09%
Undergraduate	9	16.36%
MBA	23	41.82%
Non-MBA Masters	5	9.09%
More than Masters Degree (e.g. PhD)	1	1.82%
Other	12	21.82%
<b><u>Panel B- Time spent with the company</u></b>		
Less than 2 years	14	25.45%
2 to 5 years	28	50.91%
6 to 10 years	5	9.09%
More than 10 years	8	14.55%
<b><u>Panel C- Position held</u></b>		
CEO, CFO, Director of Finance, Finance Controller, Treasurer	19	35.85%
Manager of Corporate Development, Corporate Planning, Senior Business Analysts, Projects Manager	15	28.30%
Corporate Accountant, Group Accountant, Chief Accountant	18	33.96%
Other	1	1.89%

**2. Respondents' Firms Profiles**

Tables 3 and 4 present a summary of the respondents firm's profile. The majority of responding firms are classified as either Banking and Finance sector or Services sector, with 38.18 percent for each sector. This classification system is based on the Doha Securities Market. Industrial firms consisted the remaining 28.64 percent of

the 55 responses obtained. In this study, respondents were asked to indicate their firm's size in terms of number of employees, domestic and foreign revenues from operations. Panel B of Table 3 shows that 25.45 percent of responding firms had more than 1000 employees, while 69.09% of the firms have less than 501 employees.



**Table 3: Responding Firms' Profiles (Sector and Size by number of employees and revenues)**

	Frequency	Percent
<b><u>Panel A- Business Sector</u></b>		
Banking and Finance	21	38.18%
Industrials	13	23.64%
Services	21	38.18%
<b><u>Panel B- Number of employees</u></b>		
<50	11	20%
51-200	17	30.91%
201-500	10	18.18%
501-1000	3	5.45%
>1000	14	25.45%
<b><u>Panel C- Revenues (Millions of QAR)</u></b>		
Less than 25 millions	8	15.09%
25-99 millions	7	13.21%
100-499 millions	17	32.08%
500-999 millions	10	18.87%
1-5 billions	7	13.21%
More than 5 billions	4	7.55%

In Panel C of Table 3, revenues of the responding firms were grouped into 6 categories, ranging from less than 25 millions of Qatar Riyals (QAR) to more than 5 billion. The majority of the firms have revenues in the third group (100 to 499

millions) with 32.08 percent. The smallest group in regards of revenues is (less than 25 millions) only represented 15.09 percent. Largest firms in the sample with more than 1 billion represented 20.76%.

**Table 4: Responding Firms' Operation spectrum and revenues**

	Frequency	Percent
<b><u>Panel A- Firms having operation outside Qatar</u></b>		
No	21	38.89%
Yes	33	61.11%
<b><u>Panel B- External revenues (QAR)</u></b>		
Less than 25 millions	13	39.39%
25-99 millions	5	15.15%
100-499 millions	6	18.18%
500-999 millions	5	15.15%
1-5 billions	2	6.06%
More than 5 billions	2	6.06%

**Table 5: Listing in Doha Securities Market and Dividends payment**

	Frequency	Percent
<b><u>Panel A- Listing in DSM</u></b>		
No	24	44.44%
Yes	30	55.56%
<b><u>Panel B- Firms paying dividends</u></b>		
No	8	15.09%
Yes	45	84.91%

Table 4 shows that 33 (61%) responding firms had operations outside Qatar. Thirty nine percent of these companies had less than 25 million in revenues from foreign operations. Firms with more than 1 billion from their foreign operations represented 12.12%. No other reference for revenues could be obtained for corporations and firms

not listed in the DSM. These firms represented 44.44 percent of the responses, while 55.56 percent answered to be listed, as shown in Table 5. This table also shows that 84.91 percent of the companies pay dividends.

Table 6 shows the profile of the CEOs of the responding firms in terms of age group, tenure and education level. Panel A clearly shows that the majority of the CEOs were between 51 and 60 years old (39.62%).

The second CEO age group was 41 to 50 years (35.85%), which is quite normal to see the CEOs of these age groups. Panel B shows that most of the CEOs held their positions for more than 4 years (66.04%). Interestingly,

**Table 6: Firm's CEO profile**

	Frequency	Percent
<b><u>Panel A- CEO Age</u></b>		
Less than 30 years	2	3.77%
30 – 40	9	16.98%
41- 50	19	35.85%
51- 60	21	39.62%
More than 60 years	2	3.77%
<b><u>Panel B- CEO Tenure</u></b>		
Less than 4 years	18	33.96%
4-9 years	18	33.96%
More than 9 years	17	32.08%
<b><u>Panel C- CEO level of Education</u></b>		
Undergraduate	19	38%
MBA	8	16%
Non-MBA Masters	7	14%
More than Masters Degree (e.g. PhD)	6	12%
Other	10	20%

Panel C shows that 38% of the CEOs have only undergraduate degrees. Professionals having MBA degrees represented only 16 percent of the 50 responses to this section. 20 percent of respondents marked others as they probably do not know exactly their CEO's current level of education.

### 3. Techniques Used in Project Evaluation

In order to understand the usage and importance of capital budgeting techniques, the survey listed seven different techniques and asked respondents to select all relevant techniques as well as to indicate their frequency of using each of the selected techniques. The eighth choice labeled as "Other Techniques", and if chosen, then respondent is asked to indicate these techniques. Five-point scale was provided: Never, Rarely, Sometimes, Regularly and

Always. For the sake of accuracy and reducing the bias, in the discussion we consider the respondent companies as using a particular technique if they choose "Always" or "Regularly" options. Table 7 shows the detailed distribution of responses to each technique. The percentages are calculated for the number of companies answering this question. Empty box were excluded.

The most widely used techniques included NPV, Profitability Index, and IRR.

Table 8 shows the ranking of the evaluation techniques by the percentage of frequently used and also shows the average score in the five-point scale used.

**Table 7: The Frequency of using investment and projects evaluation techniques**

Techniques	Never	Rarely	Sometimes	Regularly	Always
NPV	13.64%	4.55%	18.18%	20.45%	43.18%
IRR	15.91%	13.64%	11.36%	13.64%	45.45%
PBP	25%	6.82%	27.27%	31.82%	9.09%
Discounted PBP	23.26%	11.63%	23.26%	32.56%	9.30%
Modified IRR	35.71%	33.33%	9.52%	16.67%	4.76%
ARR	32.56%	2.33%	37.21%	23.26%	4.65%
Profitability Index	15.91%	6.82%	15.91%	38.64%	22.73%
Other Techniques	16.67%	16.67%	22.22%	16.67%	27.78%

**Table 8: Ranking of evaluation techniques by most frequently used**

	Number of companies	Mean	Frequency of (Always and Regularly)
NPV	44	3.75	63.63%
Profitability Index	44	3.45	61.37%
IRR	44	3.59	59.09%
Other Techniques	18	3.22	44.45%
Discounted PBP	43	2.93	41.86%
PBP	44	2.93	40.91%
ARR	43	2.65	27.91%
Modified IRR	42	2.21	21.43%

As can be seen in Table 8, NPV, Profitability index and IRR are ranked the most frequently used techniques. In this table the frequency is produced by adding frequencies of choices “Always” and “Frequently”.

NPV stands out as the most frequently and important technique, with 63.63 percent. Some companies listed “Other techniques” which they used as “Regularly” or “Always” in their evaluation such as “Break-even analysis” and “Liquidity ratio”. Many respondents did not declare their other techniques. While many researchers found the IRR to be on the top or second ranked, it was ranked in this study third (59.09%) behind the profitability index (61.37%). The firms in Qatar are facing many lucrative opportunities, prefer to use NPV but they use profitability index to rank the potential investment opportunities with positive NPV results. Sensitivity analysis, Scenario analysis and real options were not selected by respondents.

Also it was found that most companies did not rely on a single capital budgeting technique but employed a number of techniques in their evaluation process.

**4. Estimation of Cost of Capital**

Table 9 presents information on the use and

estimation of the cost of capital. A substantial majority of respondents (80.39%) used a cost of capital in their investment evaluation techniques.

The results showed that the CAPM was the most used method in estimating the cost of capital with 63.46 percent. Of the responding companies, 38.46 percent used CAPM with some extra risk factors and 25% used it without including risk factors. The second most popular method (17.51%) was to use the average historical returns on common stock. The role of regulatory decisions had 5.77 percent. Comparing to the findings of Chazi, Terra, & Zanella (2007), they found that the CAPM is the most frequently used with 57.1%, CAPM with including some extra risk factors came second (50.0%). The Average historical return on common stock was ranked third with 48.3percent. In general, the results of this study were consistent with these findings especially that it is done in the same geographical and economical region.

**5. Determination of Discount Rates and Terminal Values**

This section examines how the discount rate is selected for individual projects, how many years ahead the companies forecast, how they estimate terminal values, and

**Table 9: Estimation the cost of capital**

	Frequency	Percent
Using the Capital Asset Pricing Model (CAPM, the beta approach)	13	25.00%
Using the CAPM but including some extra “risk factors”	20	38.46%
With average historical returns on common stock	9	17.31%
By regulatory decisions	3	5.77%
Whatever our investors tell us they require	7	13.46%

**Table 10: Determination of the discount rate for project evaluation**

<b>Panel A- Appropriate discount rate is determined based on:</b>	Frequency	Percent
Firm's discount rate	4	8.89%
Discount rates of companies in similar business	2	4.44%
Cost of debt plus some premium	25	55.56%
Financing rate (e.g. borrowing rates)	14	31.11%
Discount rate representative of a related industry	5	11.11%
Previous experience	10	22.22%
Discount rate of the division involved in that project	4	8.89%
<b>Panel B- What is the length of forecasted period?</b>		
Less than 3 years		
3-5 years	19	38%
5-10 years	11	22%
More than 10 years	11	22%
Depends on the project	2	4%
	7	14%
<b>Panel C- How often do you adjust the discount rate over the forecast period:</b>		
Never		
Rarely	10	21.28%
Sometimes	5	10.64%
Regularly	22	46.8%
Always	10	21.28%
	0	0%
<b>Panel D- How the adjustment is made:</b>		
Adjust to reach industry's average cost of capital at some stage	7	17.07%
Adjust to reach market return at some stage	7	17.07%
Adjust according to expected changes in the level of project risk	27	65.85%
Adjust according to term-structure of interest rate	6	14.63%
Other	4	9.76%
<b>Panel E- How the terminal value is determined</b>		
Use the present value of future cash flow in perpetuity	13	28.89%
Use multiples (e.g. multiples of terminal earnings or cash flow)	4	8.89%
Both PV and multiples	19	42.22%
Use terminal book value	6	13.33%
Other	4	8.89%

whether they adjust the discount rate over the forecast period or not. The results are given in Table 10 in the next page.

As can be seen in Panel A, the majority of companies (55.56%) used the cost of debt plus some premium. This premium specified by some companies as premium for cost of equity. The second most popular alternative was the financing rate (31.1%). Twenty two percent of respondents relied on previous experience. Discount rate representative of a related industry was reported by 11.1% of companies.

The results in this study were different from those of Truong, Partington, & Peat (2008) in Australia. They found the most used discount rates were the firm's discount rate (57%), the cost of debt plus some premium (22%) and a discount rate based on previous experience (17%).

While the length of the cash flow forecast period is related to the project, the most common forecast interval was less than three years (38%). Longer intervals, 3 to 5 years and 5 -10 years are equally reported with 22% each. Only 14 percent of companies related the forecast period to the needs of the project.

Truong, Partington, & Peat (2008) mentioned that "if the risk of the project is expected to vary over time, so should the discount rate". Our findings in this section are consistent with results in the methods used to estimate the cost of capital in considering the risk and time- varying inputs. This survey showed that 46.8% of respondents were sometimes adjusting the discount rate, and 21.28 percent regularly do the adjustment.

However, 84% of respondents in Australia said they never, or rarely, adjusted the discount rate over the forecasting period.

Most of the companies in Truong, Partington, & Peat (2008) study applied a fixed discount rate for the forecast horizon of the project under consideration. In response to how the adjustment is made, 65.85% indicated they adjusted according to expected changes in the level of project risk. This finding is also consistent with previous findings in that most of the companies are considering changes in the risk of the project. Equal percentages of companies do adjust to reach either the industry's average cost of capital or the market return at some stage with 17.07% for each method. Majority of the Australian companies (58%) do the adjustment according to the expected changes in the level of project's risk.

From Panel E demonstrated that the terminal value estimated at the end of the forecast period, was most commonly based on using both the perpetuity and multiples methods (42.22%). The present value of cash flows in perpetuity came second with 28.89%. The Multiplier methods applied to terminal earnings, or cash flow, were used by only 8.89% of companies. However 13.33% of respondents said they used terminal book value, which according to Truong, Partington, & Peat (2008) "is difficult to square with finance theory". In comparison with similar questions in the US, Bruner et al (1998) found that 70% of financial advisors interviewed used both multiples and terminal cash flow in perpetuity, while 30% used multiples only. (Truong, Partington, & Peat, 2008)

## 6. Test of significance

By using the Chi-square method, with 5% probability level, a significant relation was found between applying the different techniques and the following control variables; the age of the respondent, gender, Nationality (Qatari vs. Non Qatari), education level, the experience, position, and

business sector. The most significant results are those in relation with the sector. NPV, IRR, Profitability index and Payback period methods are being more frequently used by firms in the industries sector, while other sectors uses these methods, but tend to rely frequently on other techniques. That may be interpreted as these companies are facing many long term and short term investment opportunities, and need the methods to rank these in the most appropriate way to make a sound investment decision.

## V. SUMMARY & CONCLUSIONS

The purpose of this study was to investigate the capital budgeting practices applied by the financial executives in the large firms and corporations in Qatar. A Questionnaire-based survey had been conducted. While the reviewed studies had been conducted before the alarms for the financial crisis, the results of this study is probably indicating some changes in the awareness of importance of including risk factors in capital budgeting. The large companies in Qatar, in terms

of revenues and capital, adopted the DCF methods in the evaluation of the opportunities for investments. The NPV and IRR are the most frequently used methods, and the profitability index is the most common method used to rank the different competing opportunities.

Most of the companies estimate the cost of capital, and adopt CAPM with inclusion of some extra risk factors. Still a substantial percentage of companies are using the average historical returns in common stock. For the discount rate, more than half of the companies are using the cost of debt plus some premium, mainly for equity capital. The second common discount rate used is the financing rate. The majorities of those companies reviews their discount rate, and do the needed adjustment according to expected changes in the level of project's risk. Commonly the terminal value of the project is determined by using both the present value of future cash flow in perpetuity and the multiples of terminal earnings or cash flow. The forecast period is generally more than 3 years.

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