



A Strategic Framework to Use Payback Period in Evaluating the Capital Budgeting in Energy and Oil and Gas Sectors in Oman

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ABSTRACT

This study aims to examine the associations between strategic variables and use the payback period (PBP) in evaluating the capital budgeting decisions from the perspective of managers and investors in Oman. These variables are risk, liquidity, profitability, market obstacles, management compensation and size of the company. The two samples are investors and managers where 57 out of 65 managers and 57 out of 75 investors were selected to answer the questionnaire of the study. The questionnaire consisted of seven sections with 17 questions. The regression test showed that the risk and management compensation variables have an impact on the use of PBP from the perspective of managers. Also, the risk and profitability variables have an impact on the use of PBP from the perspective of investors. On the second level of analysis, the finding of the study indicates that there are no statistically differences between managers and investors to use the PBP traced to the any of the six variables.

Keywords: Strategic Variables, Capital Budgeting, Payback Period

JEL Classifications: M40, M41, G31

1. INTRODUCTION

A capital budgeting is a decision to make a cash outlay or investments in order to receive cash inflows in the future (Hall and Millard, 2010).

Capital budgeting is one of the financial decisions that primarily concerned with sizable investments in the long-term assets; tangible such as buildings or intangible such as research and development costs. This decision is very important because it has many consequences on the firm. Capital budgeting has a major effect on the value of the firm, profitability, the value of market share and shareholder wealth maximization. There are several steps to implement the capital budgeting such as strategic planning, determining and selecting the investment opportunities, evaluating the investments and others (Dayananda et al., 2002).

One of the most important steps in this decision is using the capital budgeting techniques to evaluate the projects or investments. In this context, the payback period (PBP) is one of the most popular methods in evaluating the capital budgeting decisions. This technique is defined as the number of years it would take to recover a project's costs of investment.

Despite some problems in applying the PBP, there is a wide acceptance of this technique by managers and investors. One of the problems of PBP technique is that it ignores cash flows, which are beyond the PBP as well as the time value of money. Also, the PBP does not give a realistic result. On the other hand, managers and investors usually do not take other strategic variables into account besides of the PBP when they evaluate the capital budgeting decisions. In other words, the acceptance or rejection of the capital budgeting decisions is based only on the result of PBP without any consideration to other strategic variables which enhance the decision.

The strategic variables are profitability and profit maximization, liquidity, timing of management's compensation, size of the company, levels of uncertainty and risk and market obstacles. These variables can be considered as a strategic framework for a decision maker for enhancing the result of PBP in evaluating the capital budgeting decisions.

This study aims to examine the associations between strategic variables and use the PBP in evaluating the capital budgeting decisions from the perspective of managers and investors in Sultanate of Oman. Moreover, this study tests the differences

between two samples working in the same companies at energy and oil and gas sectors. The problem that concerns this study is to answer the following questions:

What are the strategic variables used within the PBP to evaluate the capital budgeting from managers, and investor's perspective?

What are the differences between managers and investors perspective regarding strategic variables in evaluating capital budgeting within PBP?

The study consists of seven sections. In the current section, the study presents the introduction including the aims and the problem of the study. The PBP technique is discussed in the second section. The third section presents the literature review. In the fourth section, the study presents the hypotheses, methodology, sample selection and questionnaire used in the study. Section five provides results of the analysis and section six presents the summary and conclusions.

2. THE PBP TECHNIQUE

The PBP technique is based on the idea of how much time is needed by the project to generate cash flows sufficient to recover the cost of investments. It can be also used as a criterion for acceptance or rejection of projects in the case that the PBP is higher or lower certain number of years previously defined and to differentiate between projects (Afonso and Cunha, 2009).

The PBP technique is commonly used for evaluating the investments of capital budgeting in companies for many reasons. Firstly, the technique is very easy to apply and understand. Secondly, the technique enables the manager to measure a risk of investment by examining how long it will take to recover the cost of investment. Thirdly, it is comfortable with the desire of manager in generating the liquidity. This issue is linked with pecking-order theory where the managers try to use methods that create immediate liquidity. Fourthly, the technique is used by small and medium companies because it is simple and easy to understand by owners of these companies where the small-medium businesses typically do not engage in long-term planning (Nelson and Cook, 1990).

On the other hand, the PBP technique has many deficiencies. First, it ignores the cash flows occurring after the payback time, which can lead to the rejection of profitable projects that require a longer recovery period. Second, the PBP does not consider the time value of money in calculating the cash flows. One-way of overcoming this deficiency is to calculate the PBP by appropriate discounting rate of the expected future cash flows (discounted PBP) (Afonso and Cunha, 2009). Third, Bhandari (2009) argues that the PBP technique does not evaluate or show the comprehensive image of the firm performance because it is focus on liquidity but not profitability. Further, Carsberg and Hope (1976), argue that the PBP technique is a "blunt instrument" because the main idea of PBP is an emphasis on the rapid recovery of the investment. The strong academic argument against the PBP as a valid technique is further supported by Pike (1985), states that: "Academic writers

have almost unanimously condemned the use of the PBP as misleading and worthless in reaching the investment decisions" (Maroyi, 2011).

The comprehensive image of the project's performance requires the combination between PBP and strategic dimensions (variables) in the environment of the firm. This relation will enhance the using of PBP.

3. LITERATURE REVIEW

The PBP is one of the most important techniques in evaluating capital budgeting. Therefore, there are many studies examine PBP to determine the level of preference of it and other related issues. The study of Hall and Millard (2010) has two main objectives. The first one is to investigate the capital budgeting techniques of listed South African industrial firms. The second one is to determine the relationship between these techniques and risk. The study concluded that the financial managers use more than one technique to evaluate the capital budgeting decisions. One of most important results of this study, the managers use some non-financial criteria in the evaluation of capital budgeting projects such as risk.

Ryan and Ryan (2002) examine the uses of capital budgeting techniques by 1000 chief financial officers and financial managers. The study concluded that the chief financial officers prefer net present value in evaluating capital budgeting projects, whereas the financial managers prefer to use of multiple capital budgeting techniques including PBP.

Alkaraan and Northcott (2006) examined the use of traditional financial analysis tools and selected strategic analysis approaches in the capital investment decision-making of large UK manufacturing companies. The study concluded that the financial analysis tools still used in evaluating all types of capital investments including the strategic projects while the strategic tools rarely used in this area.

Awomewe and Ogundele (2008) investigated the importance of the use of the PBP technique in the capital budgeting decisions. The study also examined the importance of this technique in relation to some criterion such as simplicity, liquidity, manager incentive compensation and the size of the company. The study concluded that this technique related (but not limited) to its simplicity, liquidity and risk assessment.

Danielson and Scott (2006) analyze the practices of capital budgeting of small business. The study uses a survey to examine the relations between these practices and size of the company. The study concluded that the size has an impact on using of practices. Also, the finding of study indicates the capital budgeting practices used in the small and large companies may differ.

Pereiro (2006) discussed the challenges of applying capital budgeting techniques in Argentina, one of the emerging markets. On the other hand, the study discussed the practices that the chief financial officers, financial advisors and private equity funds meet

these challenges. The finding of the study indicated that the firms in this country used the traditional capital budgeting techniques (such as PBP) in most of the capital investments.

Verbeeten (2006) examines the impact of uncertainty, size and industry and capital budgeting practices in 189 Dutch organizations. The findings of the study showed that these factors have an impact on the use of capital budgeting practices.

Brijlal and Quesada (2008) investigated a number of variables related to capital budgeting practices in businesses in the Western Cape province of South Africa. This study examined the relationship between some variables such as size of the firm and the process of capital budgeting. The results of the study showed that there is a positive significant relationship between these variables and the capital budgeting practices.

Afonso and Cunha (2009) studied the effects of some specific criterion namely, the pressure of the competitive environment, firm's strategy, production technologies and firm's age on using the capital budgeting appraisal methods. The finding of the study indicated that the firms used the appraisal methods with different levels of sophisticated based on these specific criteria.

Khakasa (2009) examined the use of capital budgeting techniques in appraising the investments of information systems in 25 commercial banks in Kenya. The findings of the study indicated that the level of usage of simple techniques (such as PBP) is very high.

Lin (2010) in his study asked a crucial question; why should people like PBP so much? The study attempted to answer this question through discuss the relationship between PBP and liquidity and risk. The study concluded that the PBP technique is positive associated with risk and liquidity. Therefore, PBP technique stays one of the most popular techniques in evaluating the capital budgeting decisions.

Shinoda (2010) examines the capital budgeting practices in Japan. The study used a questionnaire form to get responses of 225 people in charge of capital budgeting at firms listed on the Tokyo stock exchange. The study concluded that managers in charge of capital budgeting at Japanese firms prefer a simple PBP technique in evaluating the decisions of capital budgeting. This technique is preferred in the area of information system (short-term investments), and they cannot use the technique in the long-term investment.

Hasan (2013) examines the use of capital budgeting techniques in small business in Australia. Also, the study examines the relationship between PBP and risk analysis within the small business. The findings of the study indicate that the small businesses in Australia use the PBP but without any indication to risk analysis.

It may be noted that the literature review discusses some variables where PBP and capital budgeting influenced by them. These variables are risk, liquidity, profitability, management

compensation and size of the company. Also, it is noted that the results of previous studies are mixed. For example, the results of study of Lin (2010) that there is a positive association between risk and liquidity and using the PBP. In contrast the result of the study of Hasan (2013) indicated that there is no any association.

It becomes especially worthwhile to examine some of variables since different outcomes are expected to conclude in this area. Also, these variables are prevailing in the literature and previous studies, and they are not examining in Oman.

4. METHODOLOGY AND SAMPLE SELECTION

4.1. Hypotheses Development

Based on the literature review and theoretical implications of PBP technique, the following hypotheses of the study try to imagines the associations from the perspective of investors and managers. There are many studies examine the association between some variables and using the capital budgeting techniques. Also, these studies examine the impact of these variables on capital budgeting techniques such as PBP. Historically, the studies carried out many surveys about PBP and other capital budgeting techniques. The main conclusion of these studies is that the reason companies use the PBP that is these companies are not familiar with sophisticated techniques. Currently, there are many reasons companies use the PBP and other capital budgeting techniques with develop of strategic dimensions or variables in the business environment. These variables risk, liquidity, profitability, market obstacles, management compensation and size of the company were studied. The PBP focuses on quickly bring back the cost of investment because a high level of risk in the business. On the other hand, the PBP focuses on the liquidity rather than profitability despite the last one is more attractive for investors but may be achieved in the long-term after the PBP. Finally, the study images more details about the association of the above variables and using of PBP in the following hypotheses from investors and managers perspective. Thus, the hypothesis is:

H1: Variables of risk, liquidity, profitability, market obstacles, management compensation and size of the company have an impact on using of PBP from the point view of managers and investors.

4.1.1. Risk (R) and PBP

In this regard, there are many facts. Firstly, most results of studies in the area of risk showed that the managers are adverse risk. Therefore, they prefer the shorter PBP. Secondly, the PBP is an excellent measurement of risk because it is a measure the required time to bring back the cost of investment. Managers and investors believe that cash gained today is more realistic than the cash to be gained in the future. This idea is a link with a PBP technique in which the shorter PBPs are more desirable than longer ones. Thus, the hypothesis is:

H2: There are no statistically significant differences between investors and managers to use PBP technique traced to risk.

4.1.2. Liquidity (L) and PBP

Traditionally, the practitioners and academicians consider that the PBP as a measure of liquidity (Hajdasinski, 2007). Under pecking-order theory, the investment that will generate immediate cash flows will be highly favoured for managers and investors, in which PBP technique is the only technique that will detect this type of investment option (Awomewe and Ogundele, 2008). PBP technique can achieve the goal of liquidity because the investors and the managers desire to bring back the cost of investment through selection the projects that achieve immediate cash flows. Investors prefer to get cash as soon as possible because they are focusing on the value of cash now rather than the future. Managers prefer to recover the cost quickly because this is reflects their competence in the management of the project and to minimize the degree of risk. Thus, the hypothesis is:

H3: There are no statistically significant differences between investors and managers to use PBP technique traced to liquidity.

4.1.3. Profitability (P) and PBP

The profit and maximization of profit is the main goal of the companies. Theoretically, there is a negative association between profitability of the new investments and using of PBP (Lin, 2010). If the main goal of the company is to achieve and maximize the profit of new investment, the PBP technique does not reflect that goal because it does not focus on maximizing the profit of investments that might be achieved in the long-term after the PBP. Thus, the hypothesis is:

H4: There are no statistically significant differences between investors and managers to use PBP technique traced to profitability.

4.1.4. Market obstacles (O) and PBP

In this area, the market obstacles are all barriers that make it difficult to enter into a given market or sector. These obstacles take place in the market through the current investors and entrepreneurs to prevent the new one from the entry of market. If the level of these obstacles is low, the existing projects and investors will lose a high level of profit and vice versa. Therefore, the current managers and investors prefer to use payback as a measure to bring back their funds before any decreasing in the obstacles. Thus, the hypothesis is:

H5: There are no statistically significant differences between investors and managers to use PBP technique traced to market obstacles.

4.1.5. Management compensation (C) and PBP

Under the agency theory, there is a conflict between managers and investors (shareholders). The first party interested with their bonus and other incentives while the second party interested with profitability and growth of the firm. The managers prefer to use

PBP technique to quickly bring back cash flows because they are risk averse and not stay long in the same position. On the other hand, Pike (1985) as edited by Awomewe and Ogundele (2008) conducted a survey on the relationship between management compensation and PBP. This survey showed that firms interested in achieving the investor benefit not used PBP technique and vice versa. Thus, the hypothesis is:

H6: There are no statistically significant differences between investors and managers to use PBP technique traced to management compensation.

4.1.6. Size of company (S) and PBP

Size of the business (new projects or existing projects) may be measured by total assets or total sales. This variable has a positive association with capital budgeting techniques. Brijlal and Quesada (2008) said: In the last three decades, empirical research involving both large and small sized businesses has been conducted extensively on the use of capital budgeting techniques. Danielson and Scott (2006) determine that the capital budgeting techniques for large and small firms may differ for many reasons related to the level of sophisticated business. Most of managers and investors of small business tend to use simple techniques in capital budgeting because they are interested in immediate cash, limited resources of funds, the projects lack the human capacity and no need to a sophisticated computation. Thus, the hypothesis is:

H7: There are no statistically significant differences between investors and managers to use PBP technique traced to size of company.

4.2. Sample Selection and Questionnaire

The target population of the study is managers and investors in two subsectors; energy and oil and gas marketing in Sultanate of Oman. Those two sectors are belonging to services sector and they are very interested sectors in Oman. The energy and oil and gas sectors have acted as the key driver of Oman's economy and they continue to take the backbone in the sultanate's development. For example, revenues from oil and natural gas accounted for approximately 50% of Oman's gross domestic product in 2013 and 87.5% of total government revenues in the same year. Since 2008 the Omani's government published renewable energy study where the several projects are planned and implemented. Omani energy and oil and gas marketing companies are governmental and privately owned. There are eight companies in the energy sector and five companies in oil and gas marketing sector listed on Mascut securities market. Table 1 showed the population and sample where 65 questionnaires were distributed for managers and 75 for investor, and there are 8 questionnaires and 18 questionnaires of energy and oil and gas sectors respectively were ignored either they are incomplete or in the different companies. Therefore, the final sample included 57 managers and 57 investors in the same companies.

Table 1: Population and sample

Items	Energy		Oil and gas		Total	
	Managers	Investors	Managers	Investors	Managers	Investors
Population	40	45	30	20	65	75
Sample	38	40	19	17	57	57
Percentage	0.95	0.89	0.63	0.85	0.88	0.76

Source: Prepared by researcher

Once the sample had been selected, the design of the questionnaire was undertaken. The questionnaire consisted of seven sections; each section for each strategic variables (risk, liquidity, profitability, market obstacles, management compensation, size of the company and the PBP technique). The questionnaire designed and distributed for a sample of two populations. The managers and investors asked to determine the strategic variables that they use them within PBP to evaluate the capital budgeting decisions. The questions were measured using a five-point Likert scale. Likert scales are particularly useful to measure the level of use of a technique. Table 2 summarized the questionnaire:

As shown in Table 2, the questionnaire has seven main groups of questions. The first group of questions relates to the risk. The second group of questions was designed to describe the liquidity, whereas the third group relates to the profitability and profit maximization. The fourth group intends to give an idea of the market obstacles. The fifth group of questions relates to the management compensation. The sixth group concerns size of the company. The last group related to the PBP technique.

In order to establish a strategic framework for using PBP, the study explores the association between some variables and PBP. These variables are profitability, liquidity, timing of management's compensation, size of the company, levels of uncertainty and risk and market obstacles. The hypotheses developed based on the relationships between strategic variables and using the PBP in evaluating the capital budgeting decisions from the perspective of managers and investors in Oman.

5. RESULTS AND DISCUSSION

From the collected data about the variables of two samples, the above hypotheses were tested. The Cronbach's alpha coefficient is used to estimate the reliability of the variables of two samples.

Table 2: Questionnaire's structure

Group	Strategic factors (variables)	Abbreviation	Number of questions
1	Risk	R	3
2	Liquidity	L	2
3	Profitability	P	3
4	Market obstacles	O	2
5	Management compensation	C	2
6	Size of company	S	2
7	Payback period technique	PBP	3

Source: Prepared by researcher

Table 3: Correlations of two samples

Sample	Variables	R	L	P	O	C	S
Managers	PBP	0.658**	0.533**	0.708**	0.542**	0.567**	0.676**
Investors	PBP	0.629**	0.528**	0.640**	0.294*	0.585**	0.617**

**Correlation is significant at the 0.01 level (two-tailed), *Correlation is significant at the 0.05 level (two-tailed). Source: SPSS output

Table 4: Model summary of two samples

Model	R	R ²	Adjusted R ²	Standard error of the estimate
1	0.803 ^a	0.645	0.603	0.59962
2	0.792 ^a	0.628	0.583	0.61441

^aPredictors: (Constant), S, C, R, O, L, P. Source: SPSS output

The Cronbach's alpha for managers' sample is 0.899, and for investors sample is 0.859.

5.1. Regression Analysis

Regression analysis, utilizing the ordinary least squares method, is used to test the first hypothesis. Table 3 showed the correlations between the variables as follows:

It seems that the correlations between dependent variable and independent variables of two samples are positive and significant at 0.01 (except the relationship between O and PBP of sample of investors). The correlations of variables of sample of managers are higher than sample investors. This will help checking the statistical relationship between the dependent and the independent variables, and whether there is any potential sign of collinearity. Table 4 showed that R² is 0.645 and 0.628, which implies that independent variables included in the model explain 64.5% and 62.8% of the variation in PBP.

Table 5 presented the regression results. These results show that F-ratio is 15.160 for managers sample and 14.043 for investors sample ($P = 0.000$). This result statistically supports the significance of the regression model.

Table 6 indicated the definition of each variable in the equation of two models.

Table 6 explains that the risk and management compensation in the managers' sample and risk and profitability in the investors sample are significant variables in the regression equation (significant < 0.05). It means that the managers used PBP with the above two strategic variables. Also, the investors may use PBP with two strategic variables. From the foregoing analysis, the first hypothesis (H1) which states that the independent variables have an impact on using of PBP are accepted. The managers believe that

the risk and compensation are the important variables in evaluating the capital budgeting if they are using PBP in the evaluation.

These results are consistent with the results of study of Awomewe and Ogundele (2008); Danielson and Scott (2006); Brijlal and Quesada (2008); Verbeeten (2006) and Hasan (2013) in relation to size. Also, the results of the present study are consistent with Lin (2010) about liquidity and risk.

5.2. Mann–Whitney Results

The study used Mann–Whitney to test the differences between the two samples. In the independent samples case, the study used this test because the normality of the sample mean for each one is not achieved.

Table 7 showed the result of Mann–Whitney of differences between investors and managers to use PBP technique traced to independent variables. The significants of the test 0.566, 0.498, 0.477, 0.329, 0.499 and 0.697 for risk, liquidity, profitability, obstacles, management compensation and size respectively are higher than 0.05. This means that the hypotheses H2, H3, H4, H5, H6 and H7 are accepted, and there are no statistically significant differences between investors and managers to use PBP technique traced to independent variables.

6. CONCLUSIONS

This study examines the associations between six strategic variables and using of PBP within a strategic framework for providing a base to explain these associations. Moreover, this

study tests the differences between two samples working in the same companies at energy and oil and gas sectors. These two samples are investors and managers where 57 out of 65 managers and 57 out of 75 investors were selected to answer the questionnaire of the study. The questionnaire consisted of seven sections with 17 questions. The first group of questions relates to the risk. The second group of questions was designed to describe the liquidity, whereas the third group relates to the profitability and profit maximization. The fourth group intends to give an idea of the market obstacles. The fifth group of questions relates to the management compensation. The sixth group concerns size of the company. The last group related to the PBP technique. There are seven hypotheses were tested. The first hypothesis tested the associations and impacts of the six strategic variables and PBP technique from the perspective of managers and investors. The study used two levels of tests. On the first level, the study used correlation and regression analysis to examine the associations between the six independent variables and the dependent variable and then examine the impact of these independent variables on the dependent variable. On the second level, the study used the Mann-Whitney analysis to test the differences between managers and investors to use the PBP techniques.

The findings of the study indicate that there is a statistically positive association between risk, liquidity, profitability, market obstacles, management compensation and size of the company and PBP technique. On the other hand, the finding indicates that the regression of the model is statistically significance at 0.05 level of significance. The model showed that the risk and management compensation variables have an impact on the use of PBP from the perspective of managers. Also, the model showed that the

Table 5: ANOVA^b of two samples

Model	Sum of squares		df	Mean square		F		Significant
	Managers	Investors		Managers	Investors	Managers	Investors	
Regression	32.705	31.808	6	5.451	5.301	15.160	14.043	0.000 ^a
Residual	17.977	18.875	50	0.360	0.377			
Total	50.682	50.682	56					

^aPredictors: (Constant), S, C, R, O, L, P, ^bDependent variable: PBP. PBP: Payback period, Source: SPSS output

Table 6: Coefficients^a of two samples

Models	Managers		Investors	
	T	Significant	T	Significant
(Constant)	0.572	0.570	-0.222	0.825
R	2.475	0.017	2.785	0.008
L	-0.445	0.658	0.606	0.547
P	1.887	0.065	2.675	0.010
O	-0.331	0.742	-0.471	0.640
C	2.064	0.044	1.100	0.277
S	1.667	0.102	1.982	0.053

^aDependent variable: PBP. Source: SPSS output. PBP: Payback period

Table 7: Mann–Whitney test statistics^a

Statistics	R	L	P	O	C	S
Mann–Whitney U	1.524E3	1.508E3	1.574E3	1.456E3	1.506E3	1.556E3
Wilcoxon W	3.177E3	3.160E3	3.226E3	3.108E3	3.160E3	3.208E3
Z	-0.574	-0.677	-0.292	-0.976	-0.677	-0.398
Asymptomatic significant (two-tailed)	0.566	0.498	0.770	0.329	0.499	0.690

^aGrouping variable: R1. Source: SPSS output

risk and profitability variables have an impact on the use of PBP from the perspective of investors. On the second level of analysis, the finding of the study indicates that there are no statistically differences between managers and investors to use the PBP traced to the any of the six strategic variables at 0.05 level of significance.

These results are consistent of most results of the previous studies. There are many reasons of these results. The investors are simple, and the level of investment is not sophisticated. In addition, the objectives of companies are the investors' objectives, and because most of the managers are expatriates (most of them from Indian nationality), they are achieving the objectives of investors. Also, the managers and investors are risk averse, and they try to minimize the risk through using PBP. Liquidity and profitability are important to managers and investors, so there are no differences between them to use PBP traced to these two variables. The ability to change the facts and make market obstacles is very limited in Oman because there are laws and regulations organizing the business. According to Omani Company Law, the compensation is not exceeding 5% of net income calculated based on international financial reporting standards and the ability to use this compensation as an agency cost is limited. The agency costs related to management compensation are very fragile because the objectives of companies in Oman are the shareholders, objectives and the managers pursue to achieve these objectives.

Finally, the managers and investors use the PBP regardless the size of the company were no statistically significant differences between them. The PBP technique is simple and easy to understand. Local investors and managers in Oman are not sophisticated and they are using the PBP in evaluating capital budgeting. This result is consistent with the same result reported by Danielson and Scott (2006) and Brijlal and Quesada (2008).

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