IMPACT OF INVESTMENT TYPES AND FIRM CHARACTERISTICS ON CAPITAL BUDGETING TECHNIQUES

By :

HEMAWATHY JESSICA A/P RAJAH

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ABSTRAK

Keputusan belanjawan modal adalah keputusan yang penting bagi sebuah firma. Terdapat pelbagai teknik belanjawan modal untuk membantu firma membuat analisa yang sewajarnya untuk projek-projek pelaburan. Setiap teknik ada kelebihan dan kelemahannya. Matlamat kajian ini adalah untuk mengenalpasti teknik yang paling kerap digunakan untuk menilai pelbagai projek-projek pelaburan dan untuk mengkaji pengaruh ciri-ciri firma ke atas penggunaan teknik-teknik belanjawan modal bagi jenis pelaburan tertentu. Kajian ini dilaksanakan melalui soal-selidik. Temuduga juga telah diadakan untuk mendapat maklumat yang lebih bernas. Soal-selidik ini ditujukan kepada bahagian Kewangan and Perakaunan syarikat-syarikat pengeluaran yang beroperasi di kawasan utara Semenanjung Malaysia. Keputusan kajian ini mendapati bahawa kaedah-kaedah diskaun tunai digunakan dengan takat yang sama untuk menilai ketiga-tiga jenis projek. Kaedah tempoh bayar balik dan teknik bukan kewangan digunakan paling kerap untuk menilai projek pengembangan produk baru. Kaedah kadar pulangan perakaunan digunakan dengan takat yang sama untuk menilai kedua-dua jenis projek pengembangan. Syarikat tidak hanya bergantung kepada satu kaedah untuk membuat keputusan. Selain daripada standardisasi produk, ciri-ciri firma lain termasuk ketidakstabilan suasana, strategi firma, saiz and pemilikan firma secara terpilih menyederhanakan pilihan teknik-teknik belanjawan modal untuk projek tertentu. Hasil kajian ini diharap dapat membantu firma-firma untuk memahami bahawa teknik-teknik belanjawan modal yang berlainan sesuai untuk menilai projek yang berbeza daripada segi risiko and matlamat di bawah konteks firma yang berlainan.

ABSTRACT

Capital budgeting decision is a crucial decision for firms. Various capital budgeting techniques are available to help firms in proper analysis of investment projects. Each technique has its own strengths and limitations. Thus this study was conducted with the objectives to identify which technique is used more extensively for evaluating different types of investment projects and to examine the impact of firm characteristics on the use of capital budgeting techniques for a given type of investment. The study was conducted using a set of questionnaire. Some interviews were also conducted in order to gather richer information. The survey was directed to the Finance and Accounting department of manufacturing firms operating in the northern region of Malaysia. The findings of the study revealed that discounted cash flow methods are used to the same extent in evaluating all three types of project. Payback period method and non-financial technique are used most in evaluating expansion into new product. Accounting rate of return is used to the same extent in evaluating both types of expansion projects. Firms do not just rely on one method to make a decision. Except product standardization, all other firm characteristics which include environmental uncertainty, firm strategy, size and ownership of company selectively moderate the choice of capital budgeting techniques for certain type of project. It is hoped that this study will help firms to understand that different capital budgeting techniques are suitable to evaluate projects with different risks and objectives under different organizational context.

CHAPTER 1

Introduction

1.1 Introduction

There are two important decisions faced by corporate finance decision makers, capital investment decision and financing decision. Few of us would question the crucial importance of decision-making on investment within most companies in determining their longer-term success or failure (Pike, 1988a). Capital budgeting decision is a critical decision for firms for several reasons. The majority of capital budgeting decisions require large amount of cash investment and therefore a firm needs to make sure it is making the right decision. This is especially true since capital budgeting decisions entail a long term commitment to the project with strategic implication to the firm. Moreover, external funds may be raised through financing via borrowing or raising new capital which involves returns to the providers of funds. Therefore, firms need to evaluate carefully whether it is a right move to raise external capital to invest. Capital budgeting decision which involves binding scarce resources for a long period of time needs to be evaluated carefully to ensure maximum profitability. The opportunity costs of letting go a project versus another need to be weighed and evaluated.

1.2 Background of the Study

"The need for relevant information and analysis of capital budgeting alternatives has inspired the evolution of a series of models to assist firms in making the 'best' allocation of resources" (Cooper, Morgan, Redman & Smith, 2002). There are a handful of financial techniques developed to evaluate capital budgeting and non-

financial consideration has become more prominent as well in making the final decision. So, which techniques appear to be more popular and why?

Many studies (Gitman & John, 1977; Schall, Sundem & Geijsbeek, 1978; Oblak & Helm, 1980; Kim & Farragher, 1981; Klammer & Walker, 1984; Han, 1986; Pike, 1988a; Mills, 1988; Klammer, Koch & Wilner, 1991; Shao, 1994; Shao & Shao, 1996; Block, 1997; Kester & Tsui, 1998; Farragher, Kleiman & Sahu, 1999; Ali & Moore, 1999; Cooper et al., 2002; Ryan & Ryan, 2002 and Lazaridis, 2004) have been conducted to find out what are the most widely used capital budgeting evaluation techniques. What causes certain technique to be accepted over the others is an interesting question yet to be fully explored. What are the factors influencing the adoption of a certain technique? Are certain techniques more suitable to evaluate different types of investment? We need to understand more beyond just knowing that a certain technique is more widely used than another. Understanding the logic behind the adoption of a particular financial measure for the appropriate type of investment can aid in selecting the right method for evaluating a particular investment. For both practitioners and researchers, more in-depth knowledge on capital budgeting contributes to better evaluation of capital budgeting decisions. "Because capital investment is a key driver in corporate performance, corporate managers must understand how capital investment decisions are made if they are to participate in improving corporate performance. If managers cannot combine knowledge of the business with sophisticated financial analysis, they run the risk of becoming nonessential employees" (Farragher et al., 1999).

Determining which firm-specific and environmental factors affect a firm's capital budgeting practices is not easy. Thus, a clear understanding of a company's internal and external environments is necessary (Hasan, Shao & Shao, 1997). For a

firm operating under a different set of organization context versus another, is there a more appropriate method that can help in making better decisions? Or would a standard method be applicable for evaluating different types of projects regardless of firm characteristics?

It is without doubt that in an increasingly competitive environment, the capital budgeting decisions made by a company are critical to a firm's long-term survival. Thus it is important to choose the appropriate techniques for making these crucial decisions (Klammer et al., 1991). This paper explores the linkage between types of investment and choice of capital budgeting techniques. It also attempts to find out whether the reported use of the capital budgeting techniques vary with firm characteristics. Ultimately, firms need to re-evaluate whether they are using the right capital budgeting techniques for decision making.

1.3 Problem Statement

Financial methods used to evaluate capital budgeting can be broadly categorized as non-discounting models and discounting models. Many studies (Klammer & Walker, 1984; Klammer et al., 1991; Kim & Ulferts, 1996; Kester & Tsui, 1998; Cooper et al., 2002; and Ryan & Ryan, 2002) have been carried out to find out whether discounting models have been accepted more over the years compared to non-discounting models. Limited studies have also been carried out to identify the dominant financial technique for a specific type of investment decisions (Klammer & Walker, 1984; Han, 1986; Klammer et al., 1991). Financial decision makers know well what are the capital budgeting techniques available for evaluating investment projects in general. However, there is no specific guide on whether there is a suitable capital budgeting

evaluation technique for a specific type of project for firm operating with certain firm characteristics.

Academics in general advocate the use of discounted cash flow (Proctor & Canada, 1992; Kim & Ulferts, 1996 and Arya, Fellingham & Glover, 1998). Although discounted cash flow is the most recommended technique, it does not mean that it is the one and only technique that is fit for all purposes for firms operating in different kinds of environment. There are a number of disadvantages and limitations with discounted cash flow method which will be discussed under the literature review section.

The most serious drawback with payback period method and accounting rate of return is that they do not consider time value of money. However, there are still merits of using these methods as they offer other information which discounted cash flow method fails to provide. Are these methods suitable to evaluate certain type of projects with different objectives and risks? Non-financial consideration is also a useful evaluation but firm must be careful not to approve investment based on subjective judgment alone. So does the use of non-financial method differ across different types of project under different firm characteristic?

We also do not know whether firms with different sizes have a tendency to use a particular capital budgeting technique to evaluate different types of projects. If they do, then can it be a rule of thumb for financial decision makers? With increasing foreign investment in Malaysia and globalization, it would be interesting to see the impact of foreign ownership on capital budgeting practices as well.

Should firms facing different degree of environmental predictability use different capital budgeting techniques? Similarly, should firms with different firm strategy and product strategy choose different capital budgeting technique? In

recognizing that different firms operating in different countries having different environments impact the capital budgeting practice, several studies have been done to understand the impact (Shao, 1994; Shao & Shao, 1996; Hasan, et al., 1997).

However, these studies focus on limited firm specific characteristics for example, firm size. Studies were done in isolation looking into either impact of different type of projects or impact of limited firm characteristics.

Therefore, this paper hopes to fill the gap in literature to establish whether there is a rule of thumb for firms to use better capital budgeting technique to evaluate different types of investment projects. "Perhaps one of the most significant contributions that capital budgeting theory can make to organizational effectiveness is to shed more light on the optimal design and operation of the capital budgeting system for a given corporate content" (Pike, 1984). In order to improve resource-allocation efficiency, there must be a fit between the corporate context and the capital budgeting system (Pike, 1986). This paper will study the impact of three types of projects, namely, equipment replacement, expansion of existing products and expansion into new products, on the choice of capital budgeting techniques. And more importantly, we will also examine the impact of firm characteristics on the choice of capital budgeting techniques on these three types of projects.

1.4 Research Objectives

The study focuses on two main areas as follows:

(1) To evaluate which technique is used more extensively for evaluating different types of investment projects.

(2) To examine the impact of firm characteristics on the use of capital budgeting techniques for a given type of investment.

1.5 Research Questions

This study attempts to answer the following questions:

(1) Which evaluation technique is used most frequently out of the four categories (i) discounted cash flow methods such as net present value and internal rate of return; (ii) payback period method; (iii) accounting rate of return; or (iv) non-financial techniques for three different types of investment projects?

(2) Do firm characteristics influence the use of capital budgeting techniques for a given type of investment project?

1.6 Definition of Key Terms

1.6.1 Capital budgeting

Capital budgeting is the process of evaluating and selecting long-term investments that are consistent with the firm's goal of maximizing owner wealth (Gitman, 2003). Capital budgeting process is generally broken into four stages: project definition and cash flow estimation; project analysis and project selection; project implementation; and project review (Gitman & Forrester, 1977; Ali & Moore, 1999 and Cooper et al., 2002). A study by Cooper et al. (2002) confirmed the findings of previous studies that more firms view project definition and cash flow estimation, analysis and selection as the two most important and most difficult stages of capital budgeting process.

1.6.2 Equipment Replacement

Equipment replacement is necessary to maintain the business or to reduce the cost of production. Replacement of worn-out or damaged equipment is necessary if the firm is to continue in business (Brigham & Ehrhardt, 2003). Replacement for cost

reduction lower the costs of labour, materials and other inputs such as electricity by replacing serviceable but less efficient equipment (Brigham & Ehrhardt, 2003).

1.6.3 Expansion of Existing Product

Expansion of existing product relates to expenditures to increase output of existing products, or to expand retail outlets or distribution facilities in existing markets (Brigham & Ehrhardt, 2003).

1.6.4 Expansion into New Product

Expansion into new product is pursued to introduce a new product to the market, or to establish a position in a new market, to enjoy some technological, first mover advantage or other advantages, with promising future returns (Brigham & Ehrhardt, 2003).

1.7 Significance of the Study

This study not only attempts to investigate the impact of three investment types on capital budgeting techniques but most importantly how firm characteristics influence the use of capital budgeting technique for each type of investment project.

Most of the research on capital budgeting is carried out in the U.S. Therefore, by performing the research on Malaysian firms, the results of the study will be useful to provide a guide to Malaysian firms in selecting capital budgeting techniques to evaluate investment decisions. Han (1986) survey on Malaysian companies in 1983 showed that payback method was found to be the most frequently used technique for evaluating and ranking projects. Another study by Wong, Farragher and Leung (1987) also produced the same findings (Kester & Tsui, 1998). A study by Ali and Moore

showed that payback period method is the most popular method, but discounted cash flow is also highly used. It is interesting to find out how have Malaysian firms progressed in terms of utilizing more sophisticated capital budgeting techniques. Sophisticated techniques are those that consider risk-adjusted discounted net cash flows projected from a project (Haka, Gordon & Pinches, 1985). Has discounted cash flow emerged as the most popular method and payback period method declined in popularity?

By being able to identify the most widely used technique in each of the three types of investment decision in Malaysia, practitioners can adopt the appropriate technique. Of course, the underlying assumption is that the adoption of a particular technique to a particular type of investment is made out of rationality and applicability rather than coincidence. Academia can evaluate the suitability of the technique to the investment decision and if found not proper, then propose improvement or suitable recommendation. Selecting the right technique for decision making is crucial in ensuring that the right decision has been made to effectively use scarce resources.

Appropriate usage of capital budgeting technique would lead to better decision making which in turn would contribute to better firm performance. Although there are no studies that has successfully proved that the use of capital budgeting selection technique brings outstanding long-term performance, there is short-run improvement in the returns of adopting firms for about two years (Haka, Gordon & Pinches, 1985). The difficulty in establishing a direct linear relationship between choice of capital budgeting technique to firm performance does not in any way suggest that the choice of capital budgeting technique is irrelevant. It is merely because there are far too many variables that affect firm performance and it would be next to impossible to

establish such linear relationship. Not only using the correct method matters, but also correctly using the correct method is of utmost importance. Incorrect usage of the method results in wrong decision made on investment and rejecting worthwhile investments (Drury & Tayles, 1997). This shows the importance of capital budgeting technique in making better investment decision.

The capital budgeting selection procedures combined with other policies do bring improved firm performance (Haka et al., 1985). Studies by Pike (1988b, 1989) found significant positive association between the change in the use of investment methods and the perceived improvement in the effectiveness of capital budgeting evaluation. It is important to get more benefit per capital dollar spent and match the expenditures with the needs of the organization (Lynch, 2002).

This paper evaluates five firm characteristics which were selected based on contingency theory. By knowing whether firm characteristics influence the choice of capital budgeting techniques in evaluating different types of investments, financial decision makers and academia will be able to decide whether they should consider using different capital budgeting techniques for projects of different risk, objective and type. We hope this study is able to contribute to organizational effectiveness by firms understanding more on the optimal capital budgeting technique for a given corporate content.

1.8 Organization of the Remaining Chapters

This thesis has five chapters. We started with the chapter on introduction. Chapter two is review of literature. Methodology of research is covered in chapter three. Chapter four presents the results of the study. And the final chapter discuss the findings of this study.

CHAPTER 2

Literature Review

This section presents the review of literature on capital budgeting techniques. First the various techniques are discussed in general followed by a critical review of the preferred techniques, impact of investment types and firm characteristics.

2.1 Non-Discounted Cash Flow Techniques

Financial techniques used to evaluate capital budgeting decisions can be grouped into non-discounting and discounting methods. Time value of money is ignored in non-discounting models. Payback period method and accounting rate of return are non-discounting models. Despite the fact that they are not the recommended techniques by most theorists, many firms are still interested to use these models in making capital investment decisions (Hansen & Mowen, 1994).

2.1.1 Payback Period Method

The payback period method focuses on the time required for a firm to recover its original investment. When the cash flows of a project are assumed to be even, the formula to compute its payback period is:

Payback period = original investment / annual cash inflow

If the cash flows are uneven, the payback period is computed by adding the annual cash flows until such time as the original investment is recovered.

The investment with shortest payback period is preferred over investments with longer payback periods. However, the drawback of this method is that it ignores the time value of money and does not consider cash received after the payback period

(Hansen & Mowen, 1994). The payback method is not appropriate for evaluating long-term investment projects (Boudreaux, Ward, Boudreaux & Ward, 1999).

The reason for the popularity of this method is mainly due to the simplicity of calculation, and the fact that it is easily understood by most decision makers. Capital budgeting decision makers often comprise of persons with different backgrounds. Therefore it is important that all the team members understand the evaluation technique used to evaluate the project (Cooper et al., 2002). The other reason cited is that payback period method enables managers to evaluate earliest prospect of short term profitability (Cooper et al., 2002). Payback method provides indication of risk and liquidity. Longer payback period means higher risk as some events that make the project fail might occur. Besides, it takes longer time to receive cash from the project which might be needed for rolling over of cash flow (Chadwell-Hatfield, Goitein, Horvath & Webster, 1997).

The literature has always linked the use of payback to management being short-term focused (Brian, Patrick & Gerard, 1995; Cooper et al., 2002). Brian et al. (1995) concluded that as managers are short-term focused, they prefer using payback method rather than applying discounted cash flow techniques which evaluate a project over its lifetime and ruins short-term profit objectives. So even though managers do not think discounted cash flow methods are too complex, they would rather use the payback method and this reflects the existence of short-termism (Brian et al., 1995).

However, the study by Grinyer and Green (2003) shows that payback method can overcome potential adverse effects of short-termism. They postulated that using payback instead of net present value motivates risk-averse subordinate managers to take on more positive net present value projects with the assumption of standard patterns of cash flows, defined risk classes and asymmetrical information between

senior and subordinate managers. They argue that using payback actually creates more wealth for the stockholders than using NPV (Grinyer & Green, 2003).

2.1.2 Accounting Rate of Return (ARR)

The accounting rate of return measures the return on a project in terms of income instead of a project's cash flow. The accounting rate of return is computed as follows:

Accounting rate of return = average income / investment

An investment is accepted if the accounting rate of return is higher than a predetermined average accounting return (Boudreaux et al., 1999).

Firms with debt financing are often required to maintain healthy financial ratios. These ratios are affected by both the reported income and long term assets. Thus, the accounting rate of return may be used as a screening measure to ensure that any new investment will not adversely affect these ratios. Unlike the payback period method, the accounting rate of return takes into account a project's profitability. However, this method also ignores the time value of money (Hansen & Mowen, 1994).

The main reason firm uses accounting rate of return is because accounting rate of return serves as a guide on the accounting impact and shows the effect on the public financial statements. It is also popular as it is often the basis for performance appraisal, bonus or incentives (Burns & Walker, 1997). Other reasons that this method is used are attributed to ease of computation and ease of understanding (Burns & Walker, 1997).

Non-discounting models have always been criticised as they ignore time value of money. Chadwell-Hatfield et al. (1997) judged the use of payback and accounting

rate of return as potentially leading to the approval of projects that are not maximizing the value of the firm. Thus the use of these inferior techniques as claimed by the authors may imply the existence of an agency cost. However, there are advantages to the use of payback and accounting rate of return which discounting models fail to consider. Therefore, both payback and accounting rate of return are included in this study to examine the popularity of these techniques and which types of projects and firm characteristics are these methods more frequently employed.

2.2 Discounted Cash Flow Technique (DCF)

Discounting models consider the time value of money with discounting on cash inflows and outflows (Hansen & Mowen, 1994). Techniques that consider time value of money are typically referred to as more sophisticated techniques. Discounted cash flow capital budgeting methods are preferred by academic over non-discounted cash flow methods based on the fact that time value of money is considered. The emerging popularity of discounted cash flow method since the 1950s can be credited to Joel Dean (Adams, Bourne & Neely, 2004). The following section looks into two discounting models, net present value and internal rate of return.

2.2.1 Net Present Value (NPV)

Net present value is a sophisticated capital budgeting technique. NPV is derived by subtracting a project's initial investment from the present value of its cash inflows. Cash inflows are discounted at a rate equal to the firm's cost of capital (Gitman, 2003).

If the NPV is greater than zero, the project will be accepted. If the result is negative, the project will be rejected. A positive NPV means that the project is

earning a return greater than its cost of capital. Therefore, any surplus resulting from the NPV contributes to the wealth of shareholders. Theory recommends the NPV approach as it always selects projects which increase the value of the firm. Therefore, NPV is consistent with the goal of shareholders' wealth maximization (Chadwell-Hatfield et al., 1997).

The drawback with NPV is that it totally ignores liquidity. "The NPV criterion is not affected by whether the future cash flows generated by the asset are received in a constant steady stream, a rising or falling stream, or in a periodically 'lumpy' stream, so long as the sum of the discounted cash flows is larger than the initial cash outlay" (Wacht, 1989). NPV assumes that a firm has no problem in managing its liquidity and considers investment and financing decisions as separate issues (Wacht, 1989).

2.2.2 Internal Rate of Return (IRR)

Internal rate of return is the discount rate that equates the NPV of an investment opportunity with zero dollars. It is the compound annual rate of return that will be earned if firms invest in the project and receive the given cash inflows (Gitman, 2003). If the IRR is greater than the cost of capital, the project will be accepted. If the IRR is less than the cost of capital, the project will be rejected.

There have been arguments on whether NPV is more superior over IRR. NPV is based on projected cash flows and a given discount rate to determine the contribution to shareholder wealth. Discount rate used in NPV is the cost of capital. On the other hand, IRR assumes projects are reinvested at project IRR. For this reason, academics prefer NPV over IRR (Ryan & Ryan, 2002). Another problem with IRR is, the same project may have more than one internal rate of return (Kim &

Ulferts, 1996). Lastly, IRR is a trial and error calculation and is not flexible with respect to implementation of inflation (Boudreaux et al., 1999).

Despite the widespread support for discounting models, they are not flawless models. Pinches and Lander (1997) in their study examined the assumptions underlying net present value, which are embodied in Fisher's theory of consumer's choice. The assumptions include competitive capital markets which means there are no barriers to the capital markets, no transactions costs, there is complete certainty and there are no taxes. Pinches and Lander (1997) concluded that in reality all these assumptions do not hold true and called for more understanding on capital budgeting actual decision making process.

Another study also highlighted that the assumptions underlying the NPV rule are not always met in practice (Arya et al. 1998). They questioned that learning how to make capital budgeting decisions in settings where the assumptions do not hold is a challenge. Thus they put forward the argument that in such settings, other capital budgeting tools such as the payback period method might be more useful.

Theoretically, a firm's goal is to maximize shareholders' wealth. Therefore, theory suggests the use of discounted cash flow techniques as selection tools in order to maximize the wealth of shareholders. However, managers that are making the capital budgeting decisions might have other hidden agenda. As sarcastically highlighted by Mukherjee and Henderson (1987), "capital budgeting theory assumes that the management is unselfish; when there is a conflict between the shareholders' interest and management's, shareholders' interest take precedence. However, the personal stake of a manager may be far more important than assumed by theory".

The scepticism by Mukherjee and Henderson (1987) on the unrealistic assumption of capital budgeting theory is convincing. The agency theory introduced

by Jensen and Meckling in 1976 assumes conflicts of interests and incentives of managers and shareholders. Management often acts in its own interest and responds to economic incentives embodied in the employment remuneration (Chen, 1995). Consequently, if management put shareholders' wealth maximization as the second priority, it might influence the selection of capital budgeting technique (Chen, 1995).

Adams et al. (2004) has also argued that discounted cash flow as not being perfect. The most serious problem is on the forecasting accuracy and tendency of managers to manipulate in order to get their project approved, regardless of whether they themselves believe that their forecasts are attainable (Adler, 2000; Cooper et al., 2002; Adams et al., 2004). Management often tries to minimize this tendency by setting an artificially high discount rate. This leads to genuine good investment opportunities to increase shareholders' wealth being rejected (Adams et al., 2004). Moreover, discounted cash flow method forces forecast for cash flows far in the future. Therefore, management would rather trust near-term cash flows more than uncertain forecast in the future to make a decision (Cooper et al., 2002).

The choice of discount rate used on the NPV model directly affects the net outcome. Result of payback method does not get distorted by discount rate and serves as a good guide in managing liquidity. Accounting rate of return provides accounting impact of an investment decision which matters very much to firms with external financing. However, relying on payback and accounting rate of return lead to acceptance of projects that do not maximize the value of the firm. Therefore, the use of these techniques may imply the existence of an agency cost (Chadwell-Hatfield et al., 1997). Since both discounting and non-discounting have their own strengths and weaknesses and have opposing views, it would be interesting to study the status of all these techniques in evaluating capital investment decisions. And of course insights

into how investment types and firm characteristic influence the use of these techniques will be worthwhile to explore.

2.3 Non-financial consideration

Non-financial consideration refers to decision making that consider other qualitative factors instead of quantitative computation. Non-financial technique has received some attention as it is able to provide crucial information. Whether a project has strategic linkage, quality implications, flexibility and growth potential, and competitive response, will be considered (Chen, 1995). Non-financial technique provides vital information linking the competitive advantage that the firm tries to achieve through the investment. Hence, it is expected that types of investment projects firms are making have an influence on whether non-financial techniques are adopted in making the capital budgeting decision (Chen, 1995).

There are a number of qualitative factors that determine project acceptance. One of those qualitative factors is project alignment with future direction (Chadwell-Hatfield et al., 1997). Although most firms have established formal capital budgeting method, Vijay and Ashwani (1994) attested that forecasting methods are still dominated by subjective management estimates. Expert opinion and consensus are preferred over mathematical modelling.

Corporate strategic factors are fundamental in ensuring a positive NPV, as Farragher et al. (1999) try to convince in their study. According to them, positive NPV projects exist only if firms can maintain the competitive advantages. Hence, strategic analysis that identify where competitive advantages exist in the markets, products and services are very important (Farragher et al., 1999).

In a study by Brian et al. (1995) on investment appraisal practices of Irish companies, it was concluded that the most significant single non-cash determinant was strategy, followed by market trends. Vast majority of the firms consider multiple non-cash factors as influencing the investment appraisal process (Brian et al., 1995). Proposed manufacturing investment should consider productivity, quality, flexibility and other intangibles both in terms of evaluation of internal costs as well as potential returns through enhancement of long term business competitiveness (Proctor & Canada, 1992). The importance of volume flexible equipment and understanding the trade-off between economies of scale and flexibility in making capital investment has been described in some studies (Dixit & Pindyck, 1995; Tannous, 1996).

Marcus (1999) in his article has called for more understanding on both the non-financial benefits and costs of the investment options. His list included such considerations as synergy with corporate strategy, intangible start-up costs, impact on customer satisfaction, impact on company's image, impact on the business' complexity or manageability and preferences of key managers and important customers.

Non-financial consideration no doubt is important to incorporate strategic considerations, which include maintaining or expanding market share, strengthening competitive advantage and bringing in possibility of good future opportunity. However, the danger of over-reliance on non-financial technique and abandoning quantitative analysis is that, firms are then using faith alone to justify their investment (Wilner, Koch & Klammer, 1992). Thus, the extent of usage on non-financial technique in different types of investment is explored in this study.

2.4 Preferred Capital Budgeting Techniques

There are many studies done to determine the most commonly used capital budgeting techniques. Let us look at the trend of the capital budgeting practices over time starting with the 70's.

2.4.1 Trend in the 1970's

The stronger preference for discounted cash flow techniques was found as early as the 70's. Gitman and John (1977) attested that the use of sophisticated capital budgeting methods have increased steadily over the years. Their study on large U.S. firms verified that sophisticated capital budgeting technique was the primary tool of analysis, and the use of internal rate of return was the dominant technique. The use of payback was secondary to the use of the internal rate of return. However, net present value was still viewed as a secondary tool of analysis instead of playing a primary role (Gitman & John, 1977).

A consistent result was shown in another study on large U.S. firms where the survey indicated that 86% of the sample firms used discounted cash flow methods, most of them combined this with either payback method or accounting rate of return analysis (Schall, Sundem & Geijsbeek, 1978).

A similar trend was observed in another study on large U.S. multinational corporations owning foreign operations. The favourite primary evaluation method was internal rate of return method, while the payback period method was most frequently used as the secondary criterion. The authors further affirmed that previous surveys have documented the increasing use of discounted cash flow techniques, and the results of their survey confirmed these findings (Oblak & Helm, 1980). A study by Kim and Farragher (1981) on large industrial companies in 1979 also confirmed the

trend toward greater use of discounted cash flow method as primary evaluation technique.

Nevertheless, Rappaport (1979) argued that studies conducted from mid-1960's to 1970's have serious deficiencies which resulted in overstatement of firms using discounting techniques. He asserted that the reported increased use of discounting techniques was much lower than studies suggested due to nonresponse bias and incompatible sample that hindered comparisons among different surveys. Mills (1988) agreed with Rappaport that design and interpretation difficulties with postal questionnaires limit conclusions drawn from comparing different studies.

2.4.2 Trend in the 1980's

According to a study in the 1980's, the use of discounted cash flow technique was now the rule rather than the exception. However, internal rate of return was still preferred over net present value technique. Despite many years of criticism, payback period method was still widely used (Mukherjee & Henderson, 1987).

Surprisingly, a research carried out by Mills (1988) in UK showed contrary findings. Very large UK companies had not adopted the more sophisticated discounted cash flow techniques and instead emphasized upon traditional, simpler techniques like the payback period. The author was further convinced that the capital budgeting techniques used are found to be less sophisticated in practice than described in literature. The author deduced that judgment exerted a more important influence.

Despite the unexpected result found by Mills, it was confirmed to be true in a different study by Pike (1988a) on 100 large UK firms. The popularity of payback method continued to flourish with as high as 92% of the surveyed firms using payback. About 50% of the firms used payback to evaluate all projects. The author

put forward the argument that payback method actually has more internal theoretical strength than it is credited with. He advocated payback to be a useful tool when there is high uncertainty and inflation. In times of uncertainty, attempts to forecast detail future cash flow for the lifetime of a project can be highly speculative. Payback counters this problem by relying on near term cash flows which are more confidently forecasted to make a decision. Furthermore, payback serves a simple guide to evaluate projects for firms facing liquidity constraints (Pike, 1988a).

A look into the capital budgeting practice of Malaysian companies revealed that the single most frequently used method is the payback period among other techniques such as IRR, NPV, profitability index (PI), ARR, net future value (NFV) and subjective evaluation (Han, 1986). Payback was being used by about 47% of the respondents to evaluate more than 75% of their projects either as the only method or in combination with other methods. Discounted cash flow methods including IRR, NPV, PI, and NFV have been used for less then ten years. The main reason companies used discounted cash flow was that they viewed discounted cash flow method as being realistic since cash flow instead of accounting income were used in the analysis. Most Malaysian firms used multiple techniques to evaluate their projects. Generally, longer term projects profitability were evaluated by using discounted cash flow method while shorter term projects profitability were evaluated by non-discounted cash flow techniques (Han, 1986).

2.4.3 Trend in the 1990's

In the 1990's, the literature revealed that discounting cash flow method is widely used but is not the sole dominating method. Payback continued to remain well accepted. As for the discounting methods, IRR was the primary method used instead

NPV. This consistent outcome was observed in numerous studies performed in various parts of the world (Shao, 1994; Vijay & Ashwani, 1994; Shao & Shao, 1996; Kim & Ulferts, 1996; Chadwell-Hatfield et al., 1997).

Starting with the U.S., a survey of manufacturing firms indicated that firms used IRR followed closely by payback, while NPV appeared to be falling behind these 2 methods. Firms used multiple evaluation techniques to determine project acceptance (Chadwell-Hatfield et al., 1997).

Studies conducted on U.S. multinational enterprises having foreign subsidiaries or affiliates in various parts of the world reached similar conclusions. The conclusions are IRR was the primary capital budgeting technique; payback was the second ranked primary method; NPV was not employed as the primary method by most foreign managers (Shao, 1994; Shao & Shao, 1996; Kim & Ulferts, 1996).

A similar tendency was also observed in Canada. However, subjective management estimates and expert opinions were still the norm (Vijay & Ashwani, 1994).

A slightly different scenario, however, was found in a study on Irish companies. Payback is the most popular method of investment appraisal instead of discounted cash flow. Nevertheless, similar to other studies mentioned above, IRR is more popular than NPV for firms that do use discounted cash flow method. The authors judged that managers' strong preference for payback reflects that they are focusing on short term profit. The authors were convinced that managers' obsession with short term profitability overshadowed their willingness to use discounted cash flow methods which evaluate a project over its entire life cycle (Brian et al., 1995).

Back in Asia, a survey on Singaporean executives showed IRR and payback as being equally important techniques for evaluating projects. The authors concluded

that DCF techniques are not significantly more popular than non-DCF techniques as primary measures (Kester and Tsui, 1998).

In Malaysia, a survey by Ali and Moore (1999) identified the payback period method as the most popular method. ARR was the least popular method. Nevertheless, a high percentage (90.4%) of Malaysian listed firm used IRR or NPV.

2.4.4 Trends Since 2000

Unexpectedly, one of the contemporary studies surprised the authors. Their study on Fortune 500 companies showed that the internal rate of return was the most commonly used primary capital budgeting technique. What upset the authors was that the second most popular technique is the payback method. NPV ranked lower than payback as the primary budgeting method. The authors have condemned American managers as having the reputation for being most interested in short term profitability. They further commended foreign companies as appearing to be more concerned on long-term profitability (Cooper et al., 2002).

In contrast, totally different results were obtained in another recent survey of the Fortune 1000 Chief Financial Officers. Net present value gains the highest positive response, emerging as the most preferred method. Net present value is the most preferred tool over internal rate of return and all other capital budgeting tools. Discounted capital budgeting methods are in general preferred over non-discounted techniques (Ryan & Ryan, 2002).

In Cyprus however, a survey on small and medium sized companies found that slightly more than half of the firms there used simplified evaluation technique, and the highest used technique is the payback period technique (Lazaridis, 2004).

Despite the increasing significance of discounted cash flow method, payback method still has a strong foothold. Cooper et al. (2002) in their research concluded that the results of their study are "both encouraging and thought provoking." It is encouraging in the sense that internal rate of return as the most popular method of evaluating capital budgeting projects is one of the discounted cash flow methods. The results are thought provoking as the popularity of the payback method in evaluating capital budgeting projects is still strong.

The capital budgeting techniques that were examined in this study are discounted cash flow methods, payback period method, ARR and non-financial considerations. Based on the literature review, these are the most popular methods and therefore included in this study. These capital budgeting techniques represent more than ninety percent of usage in Malaysian firms based on the research done by Han in 1983. Another study on small business firms in the 1990s also shows that payback period method, ARR, IRR and NPV represent more than ninety percent of usage (Block, 1997). No doubt there were some articles that criticised all these so called traditional capital budgeting techniques which included payback period method, ARR, and DCF and proposed alternatives method. However, without doubt these techniques are still the most recognized techniques. Alternative evaluation techniques which have been suggested include Game Theory, strategic cost management, the multiattribute decision model, value analysis, the analytical hierarchy method, the R&D method, and the uncertainty method (Parkison, 1971; Adler, 2000). However, all these techniques have not been described even in some recent textbook, and a check with a couple of finance managers of multinational companies revealed that they have never heard of such techniques (Brigham & Ehrhardt, 2003; Gitman, 2003).