A SURVEY ON CAPITAL BUDGETING TECHNIQUES PRACTICED BY THE SRI LANKAN COMMERCIAL SECTOR

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Abstract

Capital Budgeting (CB) is one of the most important areas of firms' decision making process that contributes to long term growth of the firm. Various Capital Budgeting Techniques (CBTs) are being widely used among financial expertise. Several techniques are commonly used to evaluate capital budgeting projects such as discounted cash flow techniques such as Net Present Value (NPV), Internal Rate of Return (IRR) and Profitability Index (PI) and non-discounted cash flow techniques such as Payback Period (PP) and Accounting Rate of Return (ARR). Recent studies highlighted that financial managers are frequently using these methods such as the NPV, IRR or PP techniques (Lawrence, et al., 1997). The use of techniques is varying with different factors including organisations, managers, and size of the project. This study particularly finds the Capital Budgeting Techniques (CBT) practiced in Sri Lankan commercial sector organisations. A semi-structured questionnaire survey was conducted to gather empirical findings with the selected sample. It was found that majority of the firms are using NPV as a primary CBT while the second is given to IRR and DPP respectively. Some firms adopt more than one technique to be a primary tool and it was highlighted that NPV and IRR as the most commonly used combination in the project evolutions. The study found that majority of the firms adopts Weighted Average Cost of Capital (WACC) as an independent measure of cost of capital. It was revealed there is a high tendency towards adopting CBTs to evaluate the projects in Sri Lankan commercial sector.

Keywords: Capital Budgeting Techniques (CBTs), Cost of Capital, Commercial Sector, Sri Lanka

1 INTRODUCTION

Organisations are continuously struggling for making investment decisions in today's complex and competitive business environment. Financial specialists or managers are greatly focusing towards successful investment decisions-making processes by adopting various strategies. Investment decisions become critical for business entities as it directly affects to their business survival and long term success. According to Axelsson, et al., (2003), the capital investment decisions have implications for many aspects of operations, and often exert a crucial impact on survival, profitability, and growth of the organizations. Capital budgeting (CB) is one of the most important factors in the process of investment decision-making and it is relatively established theory in the investment realm, which involves allocation of major amounts of company resources (David and Edmond, 2004). Capital budgeting is the process of analysing investment opportunities in long-term assets which are expected to produce benefits for more than one year (Peterson and Fabozzi, 2002). Several capital budgeting techniques (CBTs) including Net present value (NPV), Internal Rate of Return (IRR), Accounting Rate of Return (ARR), Profitability Index (PI), Discounted Payback Period (DPP) and Payback Period (PP) are available to use in the project evaluation (Lawrence, et al., 1997). In practice, usage of capital budgeting techniques differs from business to business

and in some instances from manager to manager. Sometimes, theory seems to be ignored by managers in the process of decision-making (McDonald, 1998). A number of surveys into the capital budgeting practices of firms have been conducted over different countries by various researchers. Lack of research on capital budgeting techniques practiced in Sri Lankan context was stimulated to address in this research. Hence, the study finds prevailing practices on capital budgeting techniques in commercial sector companies in Sri Lanka.

2 LITERATURE SURVEY

2.1. Capital Budgeting

An efficient allocation of capital is the most important finance function in modern times that involves decisions to commit the firm's funds to the long-term assets. Such decisions are considerable importance to firm since they tend to determine its value size by influencing its growth, profitability and risk (Pandey, 1999). Needle, et al. (1984) described investment decisions as capital expenditure decisions and also mentioned that such type of decisions include installing new equipment, replacing old equipment, expanding the production area by adding to an existing building, buying or building a new factory, or acquiring another company. CB can be defined as the process of evaluating and selecting long term investments consistent with the firm owners' goal of wealth maximization (Gitman, cited in Musthafa and Mooi 2001). Needle, *et al* (1984) mentioned that CB is the process of identifying the need of a facility, analyzing different courses of action to meet that need, preparing the reports for management, choosing the best alternative and rationing capital expenditure funds among competing resource needs. According to Siegel and Shim (2006), CB is the process of making long-term planning decisions for capital investments.

King (cited in Emmanuel and Otley, 1985) noted that CB process may be broadly viewed as a sequence process that comprise of six stages; project generation or origination, estimation of cash flows, progress through the organization, analysis and selection of projects, authorization of expenditure, and post audit investigation. Moreover, as stated by Maccarone (1996), CB process involves six fundamental stages as; identification of investment opportunities, development and evaluation, selection, authorization, implementation and control and post-auditing. According to Dayananda et al. (2009), CB relates to the organisational functions as a major element. CB decisions have a long range impact on the firm's performance and they are critical to the firm's success or failure. Hence, CB decisions have a major effect on value of the firm and its shareholder wealth.

2.2. Capital Budgeting Techniques

Capital budgeting techniques is defined as the methods and techniques used to evaluate and select an investment project. It helps managers to select projects with the highest profits at an acceptable risk (Verbeeten, 2006). NPV, IRR, ARR, PI, DPP and PP are generally described as the most commonly used CBTs. Both NPV and IRR are consistent with the goal of maximising a firm's value, use cash flows, and consider cash flow timing. Pandey (1999) classified two types of CBTs as: (i) Discounted Cash Flow (DCF) criteria which involve NPV, IRR, PI and DPP and (ii) Non-DCF criteria which involves PP and ARR.

The DCF is a cash flow summary that has been adjusted to reflect the time value of money (Needles, 1984). The cost of capital is a key parameter of DCF calculation. Firms are expected to use the weighted average cost of funds from various sources including debt, preferred stock and common equity as a cost of capital (Brigham and Ehrhardt, 2002). The

majority of respondents agreed that Weighted Average Cost of Capital (WACC) is the best starting point to determine the appropriate discount rate/cost of capital in DCF techniques. Popular supplemental methods such as sensitivity analysis, scenario analysis, inflation adjusted cash flows, economic value added, and incremental IRR are also famous as a CBTs (Ryan and Ryan, 2001).

Further Perterson and Fabozzi (2002) noted that an evaluation technique should consider i) all the future incremental cash flows from the project, ii) the time value of the money and iii) the uncertainty associated with future cash flows of a capital project. The CB manuals usually required that two or more techniques be used, and as reported in earlier studies, for example no single technique was considered adequate on its own. Brijlal and Quesada (2009) suggested that businesses should not use single capital budgeting technique but instead should apply as many methods as possible for a project evaluation, in order to maximise the value of a business.

2.3. Capital Budgeting Practices

Various studies have been conducted to investigate the practice of CBT in different countries. Payne et al. (1999) mentioned that there are some similarities between U.S.A. and Canada in the area of capital budgeting practices as discounted cash flow methods are used in both countries to evaluate investment decision. Graham and Harvey (2001) investigated that IRR is the most appreciated method, while NPV and IRR are more popular than PP, DPP, or ARR (Shinoda, 2010). Kester *et al*. (1999) conducted surveys in six countries (Australia, Hong Kong, Indonesia, Malaysia, the Philippines and Singapore) in the Asia-Pacific region to investigate their companies' capital budgeting practices and found that companies in the Asia-Pacific region countries give more importance to the discounted cash flow techniques than non-discounted cash flow techniques. Hermes, Smid and Yao (2007) provided evidence that Dutch managers on average use more sophisticated capital budgeting techniques (IRR and NPV) than Chinese managers tasked with capital decision making (Brijlal and Quesada, 2009). According to Shinoda (2010), many firms in both Japan and U.S.A use combined discounted cash flow methods with non-discounted cash flow methods. Japanese firms may be able to use capital budgeting techniques effectively, depending on the subject and situation. As an example, payback period is considered when simple and short-range investment plans, and NPV is used when strategic and long-term investment plans. Khamees (2010) conducted a survey in Jordan and results show that the Jordan industrial corporations give almost equal importance to the discounted and non-discounted cash flow methods in evaluating capital investment projects. It appeared also that the most frequent used technique is the profitability index followed by the payback period.

Surveys of CB practices among large firms have indicated a widespread use of DCF methods, especially IRR (Ross, 1986). Ryan and Ryan (2001) noted that NPV is the most frequently cited capital budgeting tool of choice followed closely by IRR. Additionally, firms with larger capital budgets tend to favor NPV and IRR. According to Mills (1988), while company size was associated with the use of DCF techniques, the major influence upon the importance was found to be their required use by corporate headquarters typically expressed in the CB manual of practice. Sophisticated CB methods are being used or seriously considered by a small number of firms, mostly large industries with high investment rates and rapid changes. Most firms are relying on methods which are simpler and theoretically less satisfactory, although there may be considerable sophistication in the way in which individual practitioners apply formally simple CB methods (Klammer, 1972).

3 METHODS

A two stage approach was adopted in achieving the objectives of this study. First, a comprehensive literature survey was carried out to identify the concept of CB and various CBTs used in general. As the second step, a semi structured questionnaire survey was conducted to collect the data related to the currently used CBTs in commercial sector in Sri Lanka. The sample was selected from the listed companies in the Colombo Stock Exchange (CSE), which are categorised as public quoted companies. The survey was conducted among 30 professionals who are having expertise knowledge on the area of CB and who are involving in making CB decisions in selected 30 companies. Professional involved in the questionnaire survey include Chief Financial Executives (CFOs), Financial Managers, Finance Controllers or Executives, etc. Further, the respondents were from different areas of commercial sector i.e. banking, finance and insurance; trading; land and property development; telecommunication; services; beverage, food and tobacco; hotel and travels; and diversified holdings. The collected data were analysed quantitatively by employing MS Excel software and they were presented using bar charts and pie charts.

4 DATA ANALYSIS AND FINDINGS

The 30 questionnaires were distributed and around 84% of response rate was achieved. Sixteen percent (16%) of the respondents refused to complete the questionnaire due to their internal regulations. Further, 17% of respondents provided only the qualitative data about the CB procedure. The research findings have been mentioned in the following subsections.

4.1 Annual Capital Budget

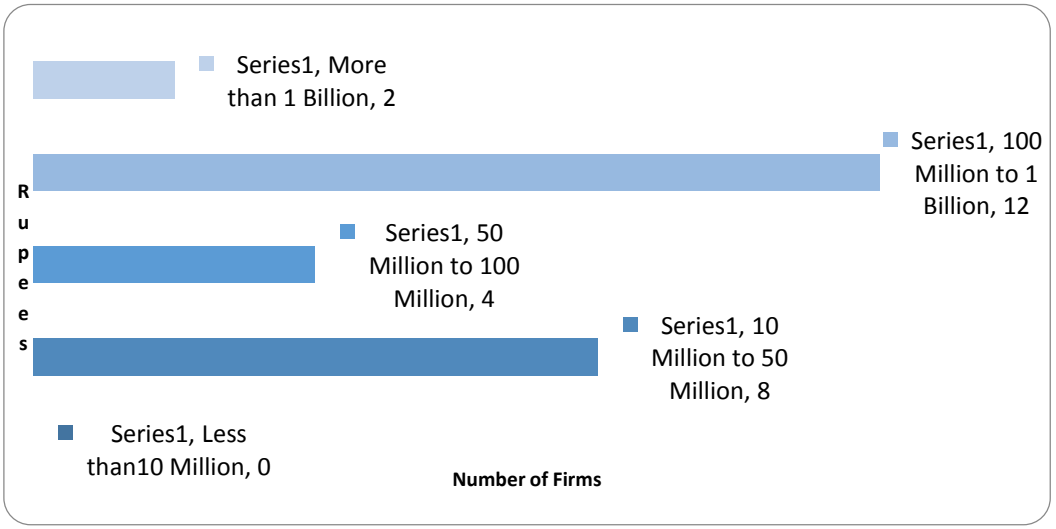


Figure 01: Annual Capital Budget

A portion of the questionnaire was devoted to determine various statistics describing the respondent firms' CB activities. The purpose was to find out the importance given to the capital expenses by identifying the size of annual capital budget. The approximate annual CB budgets were obtained into a range of data. The survey results are presented in Figure 1.

According to the Figure 1, most of the firms allocate a range of Rs. 100 million to Rs. 1 billion for their annual capital budget. From the sample, no firm is classified under the category of annual capital budget less than 10 million. Twelve percent (12%) of the firms allocate funds more than Rs. 1 billion for the capital budget. The data indicate that the responding firms actively engage in CB evaluation and analysis since most of the firms are having adequate and comparatively high amount of annul capital expenditure from their total annual budget.

4.2 Capital Budgeting Procedure

The respondents were asked to explain their CB procedure in order to clarify whether the firms are using an appropriate method of evaluating capital expenditure proposals and the importance of adopting CB process to the organization. The survey of CB procedure was based on three parameters,

- Availability of a central review committee for evaluating the proposals
- The responsible department or the division which has the responsibility for evaluating the capital expenditure proposals.
- Identify the most important and most critical stage of CB procedure

In accordance with the results, 87% of the total respondents evaluate their proposals through a central review committee with the involvement of top level managers and directors. The remaining 13% do not formally evaluate their proposals. Hence, the tendency towards a proper evaluation of alternative project decisions is shown a positive consideration.

The question relating to the division or the department which has the responsibility for analyzing CB proposals was also included in the questionnaire. Total responses exceed the number of respondents in the sample, in view of the fact that the number of respondents picked more than one choice since the responsibility for CB analysis in their firm was shared between two or more departments. Fifty six percent (56%) of the respondents mentioned that finance department has the authority for analyzing CB proposal. The outcome of the survey is complying with the findings of Gitman and Forrester (1977) where, majority of firms delegate the responsibility of analyzing CB projects to the Finance or Planning Departments. Further, it was found that some companies have formed a separate special division for evaluating extensive business assessments, since the effect of such decisions might directly affect to the share holders' wealth. Strategic business division or strategic business development division, commercial procurement division and capital expenditure division are the specially formed divisions which is the practice of 19% of the respondents. Fourteen percent (14%) of the respondents mentioned that the responsibility is also with the planning division of the organization. Research findings also highlighted that maintenance department is given to analyze the CB decisions as the majority of the capital budget is consumed by that department (11%). It was found that the evaluation process is done by the engineers when the maintenance department is involved. Their ultimate decision will be transferred to the central review committee to finalize the investment.

Study found the most critical stage of the CB process. Gitman and Forrester, (1977) simply viewed CB process as consisting four stages;

I. Project definition and estimation of cash flows
II. Project analysis and selection
III. Project implementation
IV. Project review .

In accordance with the findings, 58% of the respondents identified that project definition and estimation as the most critical stage in the CB process. Also, the first stage is highlighted as

the most difficult phase by 54% of the respondents. This result is not surprising since specification of cash flows involves numerous forecasts and tax-related decisions. As per the findings, project reviewing phase is the least critical and least difficult among the given four stages. These results confirm the findings of Fremgen (1973 cited in Axelsson, *et al.*, 2003) and Gitman, et al. (1977) which identified that most firms believed that the definition and estimation of project cash flows were the most difficult and most critical parts of the CB process.

4.3 Current Practice of Capital Budgeting Techniques

The most popular or most commonly used CBTs among the examined companies was identified in this section. The respondents were asked to indicate the primary and secondary technique used, as the priority given. The questionnaire was prepared to address a choice of the three sophisticated and two unsophisticated techniques. Their responses are summarized in Figure 2 and 3. From the total number of responses, to the question on primary technique in use, it can be seen that some respondents consider more than one technique to be a primary tool.

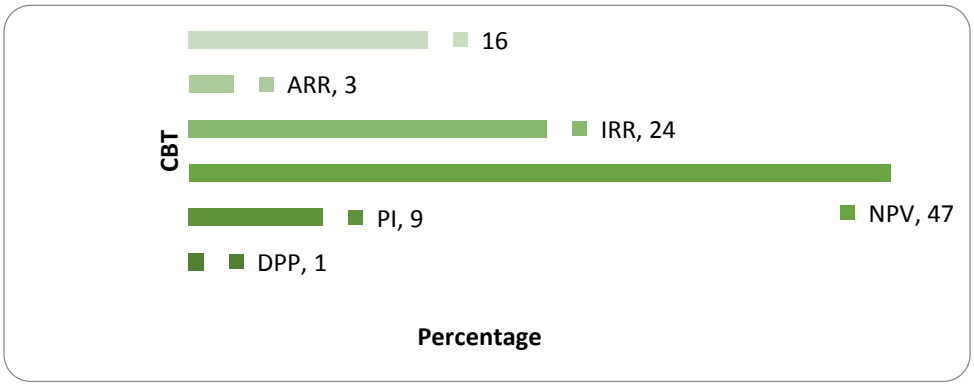


Figure 02: CBT Percentage

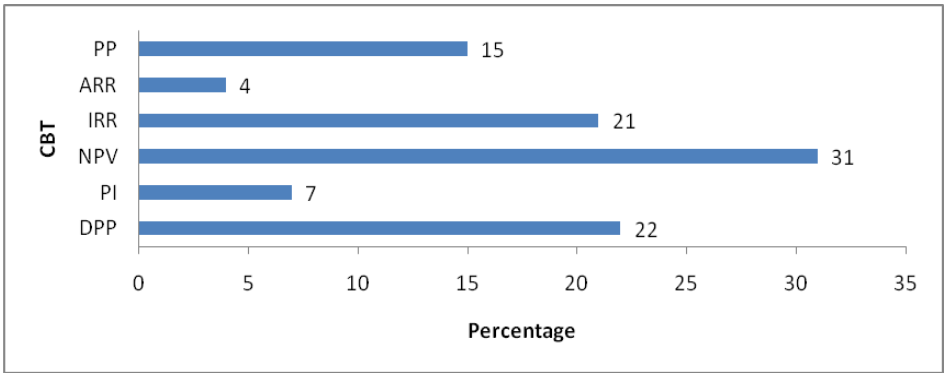


Figure 3: Use of CTs as the Secondary Tool of Analysis

The result illustrates an emphatic preference for sophisticated CBTs as the primary tool of analysis, and the use of NPV as the prominent technique where the IRR is the second preference (Refer Figure 2). The findings confirmed the literature as well. Though it was observed that the use of sophisticated techniques has been increased and the result is

complying with the previous researches, however, the ranking of the techniques was different than the previous.

The Figure 3 illustrates the most popular secondary (or supplementary) technique as the IRR. Even though the firms use PP, majority of them refused to use PP as primary or secondary technique for evaluating alternative capital investment decisions. It was discovered that the popularity of the technique has decreased among the investors, decision makers, and evaluators because of the inherent deficiencies of PP, such as ignorance of time value of money, cash flow after the PP, increasing inflation rate, etc. Further, it can be seen that the use of DPP has become popular among decision makers as a secondary technique than earlier time.

The techniques used to explain the current practice of CBTs in firms are presented in Figure 4. According to the findings, most commonly used selection technique is NPV, while the second is given to PBK. NPV is acquired 37% of total responses and PP is 26%. The graph further explicates that the 18% of the responses received is related to the use of IRR. PI has obtained 7% of the responds whereas ARR, DPP and other techniques received 4% separately. Industry analysis, competitor analysis, and Porter's 5 forces are considered as

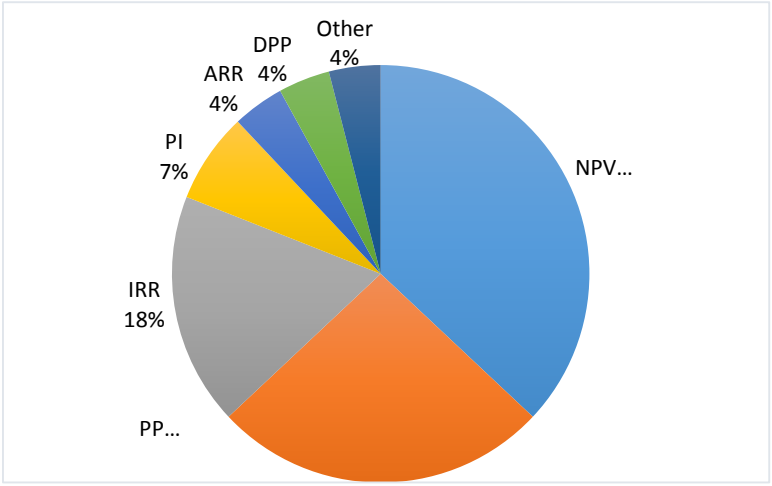


Figure 04: CBT Practices

other, since the popularity and usage of those techniques are relatively low. However, the majority of firms are using more than one technique.

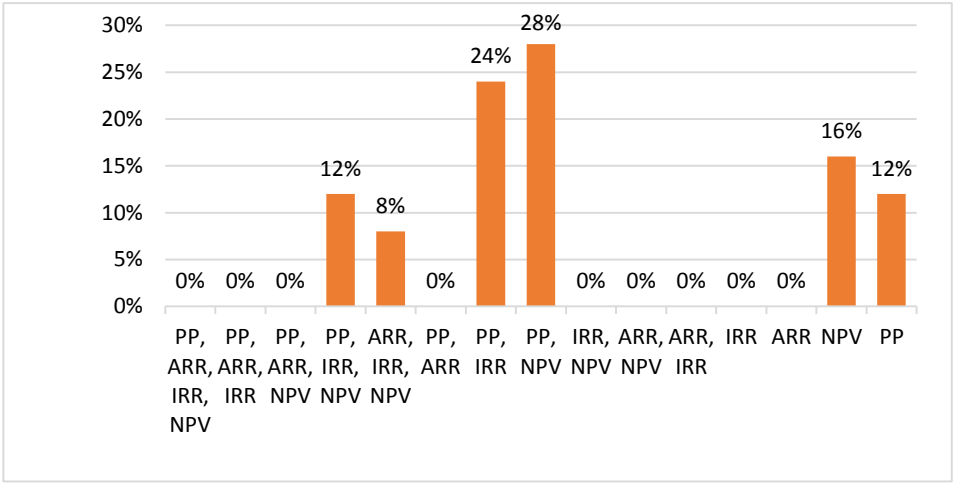
The use of CBTs were also analyzed in pursue of the combinations that can be developed to increase the understandability. Figure 5 presents the combinations of CBT used by firms. It reveals that 28% of the respondents use combination of IRR and NPV and hence, as per the composed data, IRR and NPV is the mostly used combination as an evaluation technique. Sixteen percent (16%) of the firms are observing NPV as only CBT whereas none of the firms are using IRR as the only CBT. Similarly, as found out, sophisticated CBTs are tend to use by the managers, rather than simple techniques, because the investment decisions are been highly evaluated by the central review committees and / or by the top management.

The adaption of CBTs has been differed based on the type of investment decisions. It was highlighted that 53% of respondents are mostly using CBTs for certain types of projects. Meanwhile, 27% indicates the investment type with a limitation of value. That is projects

whichever has the highest from over 25 million or 25% of net assets of the subsidiary, projects over 40 million etc. Only 20% of the firms use CBTs for their all type of investment decisions.

4.4 Cost of Capital Methods and Cut off Rates

When determining the current practice of CB, the research also interested in cost of capital or cut off rate utilized by the firms. Therefore, respondents were asked to indicate the cost of capital method used to compute value using discount associated techniques. Seven options



were included in the questionnaire to identify the available cost of capital method. The Figure 6 illustrates three types of data categories, i) methods are employed independently without merge with another method, ii) combinations of methods and iii) total of the exclusive measure and combinations.

From the total respondents, 16.66% does not adopt cost of capital, due to the inapplicability of discounted techniques as the decision making technique. Therefore, data were created from the 83.34% of firms. As shown in the Figure 6, WACC is applied by most of the firms, which

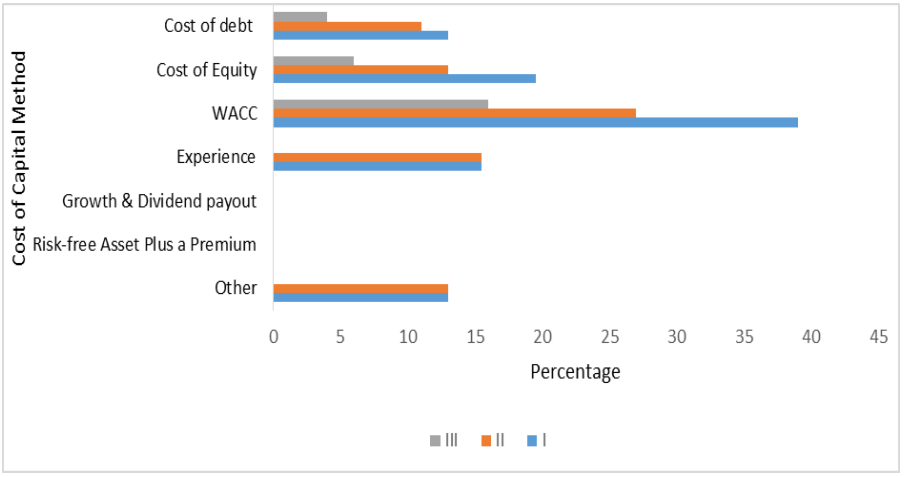


Figure 6: Use of Cost of Capital Methods

is 40.62% of the total. In addition, WACC is obtained the larger portion when it is considered as an independent measure of cost of capital. When amalgamate the above methods, it was investigated that WACC is frequently engaged in computations. It was revealed that the combination of cost of equity and cost of debt, that is WACC, is more sensible for the requirement.

A measure upon experiences is implemented by some companies where the behaviour of certain kind of projects is known to the responsible person. However, the method is not utilized independently to determine the cost of capital rate. Expectations with respect to growth and dividend payout and return from a risk-free asset plus a premium associated with the risk class are refused by entire sample. At the same time, average prime lending rate is taken in to account by 12.5% of the firms as one of the methods.

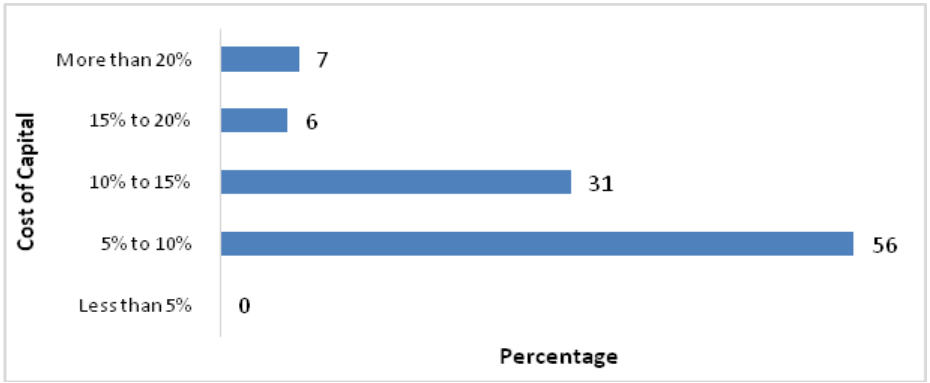


Figure 7: Cost of Capital Rates

Furthermore, the research is also concerned about the rage of cost of capital rates, which use to determine the discounted cash flow (DCF). Respondents were asked to indicate the value of the cost of capital rate used by each firm. The findings are presented in the Figure 7 by categorizing the data in to five ranges for improve the understandability. It could be found that 5% to 10% is employed by majority of the firms. That is 56% whereas the 10% to 15% is presented as the secondary highest category as shown in Figure 7.

5 DISCUSSION AND CONCLUSIONS

CB plays a pivotal role in any organization's financial management strategy. The study investigated the current practice of CBTs in the Sri Lankan context. The results show that the majority of responding companies use formal techniques to evaluate proposed capital investments. The majority of the firms allocate a range of Rs. 100 million to Rs. 1 billion as their annual capital budget. Hence, they are giving high attentions on favorable decision making process. Further, it was highlighted that majority of the firms' capital budgeting proposals are reviewing by a central review committee. Financial department has given authority to approve the budget in most firms. According to the financial managers' project definition, estimation stage is the most critical stage in the CB process where they have to consider the proper planning procedure. The majority of firms use a discounted cash flow technique (NPV) as the primary measure for evaluating capital investment proposals and IRR as the second preference. The findings also confirmed the literature as well. Even though the

firms obtain the DPP as the secondary evaluation technique, majority of them refused to use DPP as a primary technique. However, the commonly used selection technique is NPV, while the second is given to IRR and DPP respectively. It was observed that ARR and PI are rarely used capital budgeting techniques. However, some firms adopt more than one technique to be a primary tool. NPV and IRR is the most commonly used combination in project evolutions. The study found the computation methods of cost of capital. Majority of the firms adopt WACC as the larger portion when it is considered as an independent measure of cost of capital. The study revealed that the combination of cost of equity and cost of debt, that is WACC, is more sensible for the requirement.

The companies are actively engaged in CB evaluation and analysis and the use of sophisticated CBTs for project evaluation has been increased in Sri Lankan context. Also, the increase in concentration given to the implementation of theoretical background is also a considerable finding, which leads the companies to use more formal methods of project evaluation rather than arbitrarily selection of projects. It is evident that the firms in Sri Lanka are utilizing many of the tools analyzing CB projects. The proper use of these techniques and making good estimates of the cash flows of proposed investments will support the organizations for effective investment decisions.

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