A cross Sectional comparison of Capital Budgeting Practices in Pakistan

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Abstract

This article aims to evaluate current techniques in capital budget decision making techniques in Pakistan. A practical visit and mail survey were conducted which included 53 large firms in Pakistan. Empirical evidence indicates a move towards discounted cash flow (DCF) techniques but firms still lag true concepts and basic requirements for DCF techniques. NPV and IRR are most practiced techniques. Majority of firms adjust risk in computation of cash flows but small number of firms use sophisticated techniques for risk assessment. Comparing to other developed countries ratios of usage of DCF is still very low.

Keywords: *Capital Budgeting, Investment decision making, budgeting practices, discounted cash flow,NPV,IRR*

1. Introduction

Investment decisions are based on predictions of economy and experiences of past and involve consumption of large amount of resources. However if accuracy of decision is compromised then companies have many risks associated with profitability and liquidity of business. Investment decisions are very important because good decisions are strategy focused and ensure a comfortable position in the market for long run (Haddad et al. 2010) [1]

Capital budgeting is a required managerial tool. The recent financial crisis has reinforced the belief that in order to survive organizations must focus on strategic decision making and value creation. This paper will address the issue how sophistically firms use investment decisions in evaluating different projects. One duty of a financial manager is to choose investments with satisfactory cash flows and rates of return. Therefore, a financial manager must be able to decide whether an investment is worth undertaking and be able to choose intelligently between two or more alternatives. For this purpose, a sound procedure to evaluate, compare, and select projects is essential. Organizations take decisions based on their financial stability and also based on type of projects. There has been little study taking under consideration types of projects (short term projects and long term projects). The study is under taken to find out if any relation exist that effects decision making tool choice based on volume of project.

DCF is the dominant evaluation method in the UK (Arnold and Hatzopoulos, 2000) [2] ,the USA (Farragher et al., 1999 [3]; Graham and Harvey, 2001 [4]; Ryan and Ryan, 2002) [5], the Canada (Jog and Srivastava,1995 [6]; Payne et al., 1999 [7]),the India (Babu and Sharma, 1995 [8];Anand, 2002 [9]; Verma et all, 2009 [10]),the Netherland and China study(Hermes et al,2007 [11]) the Hong Kong, Malaysia and Indonesia(Cherukuri, 1996 [12]). There has been a renaissance of interest in this area of study due to concern with the technical aspects of DCF (Bosch et al., 2007 [13]; Cary, 2008 [14]; Magni, 2009 [15]) and inquisition into qualitative techniques (Pike, 2005 [16]).

2. Capital Budgeting Decision Making Techniques

Capital Budgeting Decision Making Techniques are used in planning process,they determine whether company projects are worth funding of firm's capital, they are tool to give a deep insight to decide proposed projects.

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2.1 Net Present Value (NPV):

The Net Present Value of a project can be calculated by discovering net cash flows at required rate of return and deducting initial investment.

$$NPV = \sum_{t=1}^{T} \frac{C_t}{(1+r)^t} - C_o$$

(1)

when NPV is zero or positive then we conclude that project is favorable and should be accepted. However if NPV is negative then according to NPV method we should not accept that project.

The magnitude of a project's cash flows depends on two factors:
1. Discount rate used
2. Project's cash flows.

2.2 Internal Rate of Return (IRR)

Internal rate of return is the discount rate which equals project's net cash flows to its initial outlay (investment).

$$NPV = \sum_{n=0}^{N} \frac{C_n}{(1+r)^n} = 0$$

(2)

As it is usual in practice, the project's net cash flows are not equal in all periods, so IRR is found by trial and error. The acceptability of an investment project is determined by comparing IRR with required rate of return k. If we have r > k, according to IRR project should be under taken otherwise for any case when   r < k then project should be rejected (P. Graham et al., 2003 [17]).

2.3 Benefit – Cost Ratio / Profitability Index (PI)

Profitability Index is net present value of future cash flows over the initial cash investment.

BCR = Discounted value of incremental benefits ÷ Discounted value of incremental costs   (3)

According to benefit cost ratio, the decision rule is to accept projects with benefit cost ratio greater than 1, and reject all those that have benefit – cost ratio less than 1 (James C. Van Horne, 2007 [18]).

2.4 The Accounting Rate of Return

The accounting rate of return is ratio between average annual earnings to initial investment of a project.

Average Accounting Rate of Return = Average Annual Earnings ÷ Initial Investment of Project   (4)

2.5 Payback Method (PB)

The payback period technique uses payback period as bench mark, it's the time it takes to recover a project's cash investments.

This method is not very useful because this method ignores time value of money. Secondly, there is no rule to define what length of time represents the standard payback period to measure the acceptability of a particular project. Thirdly, payback method doesn't measure profitability because according to this method profitable projects are those that recover investment outlay in shortest period of time. So, a major flaw in this method is its failure to take into account the magnitude and timing of all cash flows (cash inflows and cash outflows).Managers need to build an appropriate evaluation criteria that take into account both traditional and strategic analysis techniques(Russel et al., 2011 [19]).

2.6 Modified Internal Rate of Return (MIRR)

A problem associated with IRR is multiple IRR, condition of this situation is cash flow stream changes sign more than once.(James C. Van Horne, 2007 [17]). Rate of return on investment obtained through MIRR are more realistic (Herbert Kierulffa, 2008 [20]). MIRR is considered more sophisticated to IRR for two reasons; first, MIRR assumes that cash flows are reinvested at the rate of discount rate whereas IRR considers reinvestment at IRR rate. Second, MIRR does not face the problem of multiple rates (Prasanna Chandra, 2004 [21]).

2.7 Real Options

The theory of real options complements other evaluation techniques that do not consider project uncertainties and options such as abandonment and expansion as a whole or in a part.

Real Options is an emerging evaluation technique that provides flexibility to managers by considering the investment as an option(real assets as financial options) rather than an obligation.(Nuno Gil, 2007 [22])

Firms are lagging in adopting quality approaches for successful decision making , such as capital budgeting experts, investment manual, the use of standard model for calculating NPV or IRR and post investment audits. (Bennouna et al, 2010 [23])

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It is compared with a required rate of return to determine the project's acceptability (P. Graham et al., 2003 [17])

3. Literature Review

Capital budgeting is the process of analyzing investment opportunities in long-term assets which are expected to produce benefits for more than one year (Peterson and Fabozzi 2002 [24]). Firms have become increasingly aware (1) of the need to assess the possibility of project failure and (2) of the importance of assessing the quality of the capital budgeting and forecasting process through post-completion audits (Pike 1996 [25]). There are many methods to assist finance managers in decision making simple methods such as pay back methods and sophisticated methods such as Net Present Value (NPV), Internal Rate of Return (IRR), Modified Internal Rate of Return(MIRR) and Discounted Cash Flows(DCF). Traditional capital budgeting methods are most appropriate in assessing nonstrategic investment alternatives where the intangible elements and risks are low (Pike 1996 [25]). Discounted Capital budgeting methods are generally preferred over non discounted techniques (Ryan and Ryan 2002 [5]).

Academics have long argued for the superiority of NPV over IRR for several reasons. First, NPV presents the expected change in shareholder wealth given a set of projected cash flows and a discount rate. For mutually exclusive projects, there is some dispute over the appropriate method. Second, when cash flows come in over a longer time period, NPV assumes the intermediate term cash flows are reinvested at the cost of capital. Internal rate of return, on the other hand, assumes the intermediate term cash flows are reinvested at the IRR, which for any positive NPV project is higher than the cost of capital. Finally, NPV is not sensitive to multiple sign changes in cash flows. It is a method that presents the expected dollar amount that shareholder wealth would increase or decrease upon the acceptance of a project (Ryan 2002 [26]). It is suggested that firm size may not be the direct causal factor in determining use of sophisticated methods; size of firm influences the use of computer based capital budgeting packages which, in turn, influence the use of discounting methods, sensitivity analysis, and risk analysis techniques (Pike 1996 [25]).

Popular supplemental methods include sensitivity analysis, scenario analysis, inflation adjusted cash flows, economic value added, and incremental IRR (Ryan 2002 [26]). On one hand, most firms use present value techniques to evaluate new projects. On the other hand, a large number of firms use company-wide discount rates to evaluate these projects rather than a project-specific

discount rate. Interestingly, the survey indicates that firm size significantly affects the practice of corporate finance. For example, large firms are significantly more likely to use net present value techniques and the capital asset pricing model for project evaluation than are small firms, while small firms are more likely to use the payback criterion (Graham and Harvey 2001 [4]). Payback and profitability index are more frequently used by firms with smaller capital budgets, firms with larger capital budgets tend to favor NPV and IRR (Ryan 2002 [26]).

Some writers argue that due to advanced manufacturing technologies advancement and competitiveness, the existing accounting-based decision models (such as discounted cash flow) are said to be no longer adequate to help evaluate investments in technological innovation, mainly because of the strategic, intangible nature of the benefits involved. Many authors have claimed that a narrow focus on capital budgeting techniques for evaluating strategically important capital investments is inappropriate as it may lead to investment myopia (Slagmulder, et al 1995 [27]).

Decision making in investment methods is also influenced by several other factors such as project size, firm size and value added risk. These factors are still to be unveiled. For correct practice, firms should practice using cash flows instead of accounting income (Brealey and Myers, 2003 [28]). Including interest charges in forecasted cash flows and in cost of capital may result in rejecting suitable investment projects. So interest expenses and other financing costs makes decision making process erroneous and should not be included in project cash flows (Bierman and Smidt, 1993 [29])

Firms should incorporate inflation in decision making. Omitting inflation factor may understate results for long term projects. There are two ways to include inflation; cash flows discounted at real rate or at nominal rate (Bennouna et al, 2010 [23])

Discount rate is main element in DCF calculations. Firms are expected to use weighted average cost of capital from cost of debit, equity and preferred stock and common equity (Brigham and Ehrhardt, 2002 [30]). The weights should be defined by firm's capital structure target or market values (Bennouna et al, 2010 [23])

Firms have many divisions; each division has different level of risk. So investment projects should incorporate this factor by selecting discount rate that reflects that market niche(Frank H.M. Verbeeten,2005 [31]; Ross et al., 2005 [32])

4. Objectives

The main objective of this dissertation is to investigate about prevailing strategies techniques used for

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investment decisions for capital budgeting in Pakistani firms. There are some objectives that are subject to examination in this study:

a. How companies Identify a project ?
b. What are main capital budgeting practices used by firms?
c. What is basic criteria and reason being used by companies for using a specific method (payback/NPV/MIRR/DCF)?
d. Do companies use different approaches for different subdivisions projects?
e. Do companies use discounted cash flows and different discount rate for different subdivisions according to market values, how weights are defined?
f. To what extent education level effect capital budgeting decisions?

5. Methodology

A population of 450 companies was chosen from Lahore stock exchange, almost 156 companies couldn't be reached, so it was assumed that they are no longer part of population, sample size was limited to 294. Companies were contacted through email, questionnaire was sent in soft form to be filled electronically. A follow-up procedure was initialized immediately to call each company(CEO/CFO) individually and ask them to fill questionnaire, and provide hard copies through fax or personal visit. Companies were reminded twice again to fill questionnaire in the upcoming week. Procedure also included going personally to companies and have one to one meeting with CFOs and assigned competent authorities to fill the questionnaire. Received response from 53 companies, shows response rate of 18 % which is nearly equivalent to similar study by Bennouna et al., eds. 2010 [23], that got a response rate of 18.4%.

6. Results

Table 1 represents a great trend of Pakistan corporate towards use of NPV (34% use always, 49.1% use it almost always). There is a trend to use IRR as investment evaluation technique. Majority of firms (47.2%) don't use MIRR in comparison to very small number (11.3%) that is actually employing it always as evaluation practice. Most of the companies never use PB (39.6%)only 17% use it always . Statistics represents real options are not implemented by most Pakistani firms (70%). Research shows most of the companies (60.4%) use NPV as DCF technique.

Table 1 : Evaluation techniques for investment projects

Variable Name/ Usage Level in %	Never	Almost Never	Almost Always	Always
Net Present Value(NPV)	15.1	1.9	49.1	34.0
Internal Rate of Return(IRR)	7.5	28.3	24.5	39.6
Modified Internal Rate of Return(MIRR)	47.2	28.3	13.2	11.3
Profitability Index (PI)	15.1	17.0	28.3	39.6
Payback Period(PB)	39.6	17.0	26.4	17.0
Accounting Rate of Return(ARR)	45.3	24.5	15.1	15.1
Real Options	69.8	17.0	7.5	5.7

Statistics shows that most of the companies (39%) in Pakistan identify projects from expansion projects existing operations, almost 34% take expansion projects from new operations and almost 27% companies have replacement projects.

CFO education is related to use of sophisticated evaluation techniques; statistics shows that undergraduate CFOs are less likely to use NPV. Undergraduate CFOs have equal probability to use IRR i.e., 50% use IRR while 50% don't use it. Only 25%use it sometimes. CFOs who are MBA, other or higher education are more intended to use NPV, IRR and MIRR. Companies for analysis purpose divided into two categories small companies (having total number of employees < 1000) and Large companies (having number of employees > 1000). Ratio of large companies that always use NPV are 37.5%, 37.5% almost always use NPV. There are 25% of large companies that never apply NPV technique for evaluation of investment projects. Small companies comparatively show high score in using NPV. Statistics shows large companies are leading in usage of IRR to small companies with 16% never use IRR and 28% almost never use IRR. Analysis shows neglect from latest sophisticated technique (MIRR), 35.7% large companies while 60% small companies never use MIRR. Only 14.3% of large companies and 8% of small companies always use MIRR technique to evaluate investment projects. Statistic represent that small companies (20% almost always, 48% always) are most likely to use PI as compared to large companies (35.7% almost always, 32.1% always). Payback method is mostly

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practiced by small companies (14% always use and 32% use it almost always), large companies also use payback method along with other strategy focusing discounted cash flow techniques. Accounting rate of Return is not usually practiced in corporate Pakistan, it has discouraging ratio in both small and large companies (40% small and 50% large companies never practice ARR). Real options theory is never practiced in small companies, in large companies, it represents low percentage (10.7% practice it always and 14.3% claims they use it almost always).

There are 60% of companies that are using NPV as DCF technique while 80% of these 60% use discounted cash flows. 40% employ IRR (17.4% of these 40% don't use discounted cash flows while computing IRR). Table 6 shows that majority of firms (75% large companies, 76% small companies) use different rates of return for different projects.

Statistics shows 89% companies use cash flows in DCF techniques. In comparison to number of companies 89% use cash flows but only 77.4% use discounted cash flows. Only 62.3% firms are using WACC. Many firms still define weight from book values, 32.1 %.

Descriptive statistics shows almost 24.5% companies don't use different rates of return for different subdivisions, they just use single rate of return for company wide range of divisions. Analysis shows comparison of large companies to small companies in use of different rate of return for different divisions or projects, 25% large and 24% small companies use a single discount rate for all projects and divisions of firm. Relationship is being analyzed by Chi Square test between company size and rates of return for different subdivisions. It gave Chi Square value of .007 and significance value 0.933 which is greater than set level of significance α=0.05. Analysis shows, 18.9% companies don't incorporate risk factor through including nominal or real cash flows.

Descriptive statistics shows a very small number of companies (34%, 30.2%) use scenario analysis and sensitivity analysis respectively. Firms are not used to simulation and decision tree analysis. Surprisingly very small number (17%) always employ risk adjusted discount rate. Descriptive statistics represents majority of firms are using quality oriented practices, 69.8% have at least one number assigned for investment analysis, 75.5% firms posses a capital investment manual, 84.9% firms involve use of standard model for analysis computations and 75.5% conducts post audits for capital budgeting evaluation.

7. Implications for Practice

There s theory practice gap in DCF application in firms in Pakistan. Although many companies are using DCF many essential parts of DCF are not applied correctly.

This study provide a tool for firms involved in capital budgeting decision to common pitfalls, which if practiced could improve capital budgeting.
Areas that need attention in decision making are:

- DCF
- Superiority of NPV and MIRR over IRR
- Firms should use real options
- Multiple discount rates for different divisions and projects of firms with different uncertainty levels
- Application of WACC discount rate rather than single source of financing
- Market weights or target weights should be included in WACC calculation
- Educated and trained staff
- Use of capital budgeting information systems in analysis for use of standard models, economic trends and incorporate inflation rate

8. Limitations

Several aspects of this research has limitations on practical outcomes. First non response bias is a potential issue with the surveys. Second, the research was limited to small group of companies in Pakistan. Was this sample a true representative of population? Does the capital budgeting practices implemented could be generalized to the firms located in other geographic areas? Third study relied to traditional survey method. This also was the novel opportunity to research in Pakistan firms where no previous research has been undertaken so far, that could serve as a base for comparison with previous studies. Fourth, the focus of this research was limited to selected aspects of capital budgeting. DCF is only one of the decisive factors associated to sophisticated capital budgeting. Finally, this study and supported literature assumes that managers make rational decisions.

Further research could be made regarding in-depth study of DCF practices by means of case studies, focus groups and interviews to investigate further elements in organizational context that take effect in proper application of DCF techniques. Another area of research could be a study of risk adjustment in DCF of all the country specific factors (over taxes, unpredictable governmental policies, energy crisis, high inflation rate, terrorism).

9. Conclusion

This paper examined capital budgeting sophistication in Pakistan corporations. From this study following broad inferences can be drawn. DCF is the most favored technique practiced as favored by literature too. Non DCF are still used but use is not frequent as compared to DCF

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techniques. Pakistan corporate lag in use of latest sophistication techniques such as MIRR and real options. Although majority of firms use DCF technique but sophistication in application is moderate. There are many areas that need to be improved especially use of MIRR and Real options, these have the lowest prevalence. Other areas where a fourth firms could be improved are administrative procedures, well qualified analysts, use of sophisticated information system ,post audits of investments evaluations, using WAAC and adjusting in to varying uncertainty levels according to company subdivisions and projects.

Limitations included being confined to one country Pakistan and one short survey, this research adds to the body of knowledge on capital investments by showing where Pakistan fits in 21st century. This study improves practice by addressing most common pitfalls encountered by firms using DCF techniques. Nonetheless room for improvement for Pakistani firms, why companies are still using old practices and MIRR and real options are not still practiced.

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