CHAPTER 9
SUMMARY, FINDINGS AND CONCLUSIONS OF THE STUDY

9.1 Introduction to the Study

A typical investment or capital budgeting decision involves certain sacrifice of resources now, in exchange for an uncertain but hopefully large inflow of resources in the near or distant future. Capital budgeting decision is considered to be the most important and crucial decision among the four finance functions, because it determines the value of a firm by influencing its growth, profitability and risk. This decision, if undertaken judiciously, helps in providing the benefits of maximization of wealth, not only for the concerned organization and industry, but also for the economy as a whole. On the other hand, if this decision is not given its due importance, it will ultimately lead to the decline and demise of even a growing and prosperous organization.

9.2 Need and Scope of the Study

Literature review reveals that Indian research studies so far have concentrated either on financial goals or on capital budgeting techniques or on all areas of corporate finance. No comprehensive study has been conducted in the area of capital budgeting, incorporating a detailed analysis of various aspects of capital budgeting. There is a need to focus separately on the different sources of risk, risk factors and their adjustments. Similarly, a study of discount rate/cost of capital practices along with cost of equity capital and required rate of return needs to form a part of such studies. Further, a study of different stages of capital budgeting and of non financial considerations while selecting projects have been ignored by the Indian researchers. There is also a need to study the usage of advanced capital budgeting techniques like Modified Internal Rate of Return (MIRR), NPV adjusted with Real Options Analysis, Economic Value Added (EVA) and sophisticated risk techniques like Simulation Analysis, Decision Tree Analysis, Probability Theory etc. by the Indian corporate sector. Previous researchers have examined the impact of nature of industry and the size of the companies on the choice of capital budgeting techniques, but have ignored the impact of other variables like size of capital budget, CEO education, age of the company, type of investment. Also, research in this area needs special attention, particularly, when a number of changes have taken place in the economic and
business environment, both in domestic as well as in global markets during the last few years, which have had a considerable impact on the investment scenario that has become very risky. This may as well influence the investment appraisal techniques, especially risk techniques, employed by companies for evaluating their investment proposals.

9.3 Objectives of the Study

The present research work was undertaken with the overall objective to examine in detail the capital budgeting practices being adopted by Indian companies in the turbulent and risk prone business environment. The specific objectives of the study are:

1. To study the corporate practices regarding the capital budgeting techniques or methods used for evaluating an investment proposal.
2. To study the criticality in terms of level of difficulty, importance and riskiness of different stages of capital budgeting process, and the factors affecting capital budgeting techniques which are being applied by the companies.
3. To investigate the corporate practices concerning cost of capital and cost of equity capital.
4. To analyze the different sources of risk, their adjustments by companies, and the corporate practices regarding the capital budgeting techniques incorporating risk.
5. To identify the non financial and other factors considered by the companies and their relative importance while evaluating projects.
6. To study the impact of different variables on the selection of capital budgeting technique and risk handling techniques used by different companies.

9.4 Hypotheses of the Study

Based on the review of literature, the following null hypotheses were formulated and tested:

\( H_{01} \): The size of a company’s capital budget, its sales revenue and nature of the company do not affect the selection of a particular capital budgeting method.

\( H_{02} \): Age of the company and education of CEO do not affect the selection of a particular capital budgeting method.
H$_03$: The size of a company’s capital budget, its sales revenue and nature of the company do not affect the choice of methods for incorporation of risk in capital budgeting.

H$_04$: Age of the company and education of CEO do not affect the choice of methods for incorporation of risk in capital budgeting.

H$_05$: The types of investment project (new, existing or replacement) do not affect the selection of a particular capital budgeting method as well as the methods for risk incorporation.

H$_06$: The size of a company’s capital budget, its sales revenue and nature of the company do not affect the choice of different methods for calculating the cost of capital.

H$_07$: Age of the company and education of CEO do not affect the choice of different methods for calculating the cost of capital.

H$_08$: The size of a company’s capital budget, its sales revenue, nature of the company and variables as age of the company and education of CEO do not affect the level of difficulty associated with different stages of capital budgeting process.

9.5 Methodology of the Study

With a view to accomplish the above objectives of the study, a large number of companies were selected from those listed on Bombay Stock Exchange (nearly 4928 as on 10 Nov 2008, Source: http://www.bseindia.com/about/st_key/list_cap_raised.asp) and were contacted through e-mail. For collecting primary data, a structured questionnaire was framed after pre-testing, and mailed to the companies. A website was also constructed to help CFOs or Finance managers save their time by enabling them to fill the questionnaire online. At first instance, the response rate was quite low. Subsequently, reminders were sent to these companies by re-mailing the Questionnaire as follow-up with a view to pushing up the response rate. While collecting the data, the following problems were encountered:

- The respondents were CFOs, Director Finance etc. who are knowledgeable people, but had hectic and busy time schedules. As a consequence, they had to be persuaded repeatedly to spare their time to fill up the questionnaire.
Many of the company personnel reluctantly filled up the questionnaire, and in a few cases did not supply complete information.

Subjectivity in the responses, especially in questions relating to personal opinions, is also feared.

However, hectic persuasion resulted into 77 CFOs’ responses from different companies. These sampled companies were classified according to size of their capital budget, industry type, sales turnover, qualifications of their CEOs, and the age of the company. The data collected was analyzed using cross tabulation and simple statistical techniques like percentages, compare means and standard deviation as and when required. Further, advanced statistical techniques like One-Sample Kolmogorov-Smirnov Test (Ks test), Cronbach’s Alpha, Kruskal Wallis H Test, Weighted Average Score, Chi-square analysis, Factor Analysis, Multi Dimensional Scaling (MDS) were also used.

9.6 Findings of the Study

The main findings of the study have been summarized in the form of four separate sections. Section I presents the findings regarding Capital Budgeting Practices in Indian Companies, Section II regarding Capital Budgeting Practices Incorporating Risk in Indian Companies, Section III regarding the Cost of Capital and Cost of Equity Capital Practices in Indian Companies and Section IV focuses on Non Financial Criteria and Factors Affecting Project Selection.

Section I

Capital Budgeting Practices in Indian Companies

9.6.1 Formal Capital Budgeting Analysis Practiced by Companies

I. The hierarchical level of personnel involved in taking capital budgeting decisions, in majority of the companies, is the senior level management. These companies consider it as a higher level decision which is taken primarily at the senior level of management.

II. Moreover, formal capital budgeting analysis is done for investments in projects of smaller capital outlay even for less than Rs. 1 crore. This is because capital budgeting is a crucial decision which affects the value of a firm. A wrong project selection will not only waste the financial resources but will also dampen the value of a firm.
9.6.2 Types of Investment Projects

I. Almost four-fifth of the sampled companies reported Expansion of existing business as the investment project in which they invested. Entry into new business, and Equipment replacement and modernization were preferred almost by an equal proportion of companies (53.2 percent and 59.7 percent, respectively).

II. As the scale of capital budget increases, there takes place a sharp increase in companies opting for Entry into new business or for Expansion of the business. This is because of the increased availability of funds to companies with larger capital budgets. Across different industry types, all types of investments are common especially Expansion of existing business.

9.6.3 Capital Budgeting Techniques Preferred by Indian Companies

I. The survey revealed that among the traditional methods, Payback period and, in the discounted category IRR and NPV are the most preferred ones by the companies in Indian corporate sector. The preference of DCF techniques like NPV and IRR and advanced techniques of NPV with real options; MIRR etc. is likely to increase with the size of capital budget while Payback is unanimously preferred across all capital budget sizes. This is so because in these higher capital budget companies, huge investments are made and a wrong investment project selected will endanger the very survival of a business enterprise. All other methods are less used. Thus, Indian companies are increasingly adopting sophisticated capital budgeting techniques.

II. The companies in manufacturing sector make high usage of Payback period as well as DCF techniques of NPV and IRR. On the contrary, the services industry makes high usage of discounted techniques of NPV and IRR but less usage of Payback. In the manufacturing sector, transport, cement, chemicals, consumer durable and in services, the ICT sector makes some use of the advanced techniques of NPV with Real Options, MIRR etc.

III. It is observed that larger the size of company (on basis of sales revenue) the more sophisticated are the techniques used by them. This is because these companies make larger investments and also have well qualified personnel available who can experiment with the latest techniques. However, the Payback
is highly preferred irrespective of the sales revenue (size of company) because of its practical utility yet simplicity

IV. The older Indian companies find Pay Back period method more useful and relevant in project evaluation than the younger ones. These companies over the years find Payback period a simple but practically useful capital budgeting tool. However, these companies did not find ARR as much useful. Also younger gave slightly more weightage to NPV while older to IRR. Though the proportion of younger companies using advanced techniques like MIRR and NPV adjusted with Real Options is less but their proportion is somewhat higher than the older ones. Thus, the younger companies with fresh minds at work are willing to experiment with the new methods.

V. Our survey also reveals that CEOs of various educational qualifications with even CEOs having greater than master’s degree unanimously give high preference to Payback period. This is so because this method emphasizes on the practical aspects of liquidity and considers risk and uncertainty associated with the future. It found that in Indian corporate sector the proportion of CEOs preferring DCF techniques of NPV and IRR increased with the increase in CEOs educational level with all of CEOs having greater than masters degree using NPV method. Also CEOs with technical qualifications (BE/B.TECH/M.TECH etc) are more forthcoming to use advanced techniques like NPV with Real Option, MIRR etc than even MBA CEOs and CEOs with greater than masters degree. This reveals that even the most educated CEOs were hesitant to make use of these techniques. Only technically sound CEOs with technical degree are forthcoming to try new methods and techniques.

VI. Indian companies also use Payback period method across all types of investment and its usage is even more in case of Expansion of existing business, and Equipment replacement and modernization. IRR is preferred more for Expansion of existing business and Entry in new business while NPV especially for Entry into new business. Advanced techniques of MIRR, NPV adjusted with Real Options and EVA are preferred more for evaluating projects of entry into new business. This is because companies are more cautious when making an entry into a new business line which does not match with their existing business. As a result they conduct rigorous financial analysis and use sophisticated techniques.
VII. Results of Kruskal Wallis (H test) applied to find association between company related variables and usage of capital budgeting techniques reveal that the size of capital budget has a significant relation with NPV and EVA methods at 5 percent level and with IRR and MIRR at 10 percent level of significance, whereas, with all other methods the relation is found statistically insignificant. The usage of these sophisticated methods is thus positively correlated with size of capital budget, with higher capital budget companies preferring more of sophisticated discounted cash flow methods. The type/nature of industry has a significant relation only with MIRR and Hurdle rate at 10 percent level of significance. A significant association at 5 percent level of significance is found between sales turnover and usage of Payback period, and also with APV methods and Earnings multiple approach, at 10 percent level of significance. The relation between usage of different capital budgeting techniques and age of the company is found insignificant except in case of Payback and Earnings Multiple Approach with which it has significant relation at 10 percent level and with APV at 5 percent significance level. However, no significant association is found between capital budgeting techniques and CEO educational qualification. Similarly, no significant association is found between capital budgeting techniques and investment type except, in case of Profitability Index which had significant association with expansion of existing business.

9.6.4 Reasons for Usage/Non usage of techniques of Capital Budgeting Techniques by Indian Companies

I. The survey reveals that the main reasons for non usage of DCF techniques (though by a few companies) are its ‘non-suitability of these techniques as per the business condition’, ‘high level of complexity and difficulty of these techniques’ and ‘unwillingness of top management to implement’ these techniques.

II. The main reasons for usage of DCF techniques by a vast number of companies are that they consider ‘time value of money’ and ‘cash inflow throughout the life of the project’. Further, the main reason for usage of traditional NDCF techniques either alone or in supplementary to DCF techniques is its ‘emphasis on liquidity’. Also reasons like ‘considering risk and uncertainty associated with future’ and ‘easy to calculate’ are stated by many.
9.6.5 **Other Considerations while Usage of Capital Budgeting Techniques**

I. Majority of Indian companies use multiple capital budgeting techniques in evaluating investments especially ones with higher capital budgets. A vast majority of companies use a combination, wherein NDCF techniques are used in supplement to DCF techniques. This is so because while DCF techniques like NPV and IRR show the value addition or accurate profitability of project while NDCF techniques like Payback on the other hand, emphasize on the early recovery of cash and lesser risk.

II. In Indian companies’ standard Payback period is generally decided subjectively by the management keeping in mind their past experience and it generally falls in the range of 5-10 years. This is probably because a payback of less than 5 years is too less to recover investment while that of greater than 10 years increases the risk and uncertainty associated with future.

III. In contrast to academic theory, it was found that a good majority of 59 percent of the respondent companies believed that there is no contradiction between NPV and IRR methods of project evaluation. However, a good proportion of 41 percent of them agreed that NPV and IRR may show contradictory results. Thus, the Indian companies are equally divided on the issue of NPV-IRR contradiction and both the methods are preferred in almost equal proportion in such situations.

9.6.6 **Discount Rate/Cut Off Rate in Investment Evaluation**

I. Our survey reveals that, in practice WACC is the most preferred discount rate which supports the academic theory also. This is so because it reflects the weighted average cost of all different sources of funds used by a company in one percentage figure. Cost of debt was the next preferred discount rate especially in companies where less of equity and more of debt is used. The other discount rates of Cost of retained earnings, Cost of new equity, Historical rate, and Arbitrary cut off point and term lending rate were preferred almost negligibly.

II. Multiple discount rates for different projects are more popular with Indian companies, and majority of these companies adjust their discount rates for the risk element involved in different projects. This is so because companies feel that each project has its own risk and a single discount rate cannot reflect their
individual riskiness. Further in case of overseas projects majority use either the same company-wide discount rate as in the domestic market or a risk adjusted discount rate for particular project.

9.6.7 Cash Flow Forecasting Methods

I. Majority Indian companies use quantitative methods for estimation of cash flows. This is so because the mathematical or quantitative procedures give more accurate estimates than subjective estimates. However, subjective estimates of cash flows by the management may still be used at times.

II. Further, majority of Indian companies make an adjustment in cash flows for incentive, subsidies and rebates availed from the Government, with the only exception being services industry where majority of the companies did not make such adjustments.

9.6.8 CFOs Ranking of Capital Budgeting Methods, Discount Rates and Factors affecting Capital Budgeting

I. The perceptual mapping of the CFOs preferences of different capital budgeting methods supports the academic theory in several ways. The CFOs assigned a high degree of preference for the relatively sophisticated DCF techniques of IRR and NPV. Among the theoretically less sophisticated traditional NDCF techniques, Payback is the exception which is high on CFOs rating preference. The highly advanced techniques like MIRR, NPV adjusted with Real Options are preferred less. This may be due to the level of complexity and difficulty associated with the use of these techniques.

II. The perceptual mapping of the preferences of different discount rates also supports the academic theory. WACC which is considered superior in academics is also given highest preference in practice as discount rate by the CFOs. It can be observed that this discount rate is medium on the difficulty level and high on accuracy and effectiveness. After this the second best ranked is the Cost of debt. The Arbitrary rate set by management and Historical rates along with Cost of retained earnings and Cost of new equity were the given the lowest ranks.

Thus, our survey reveals, that Indian CFOs give highest ranking to NPV and IRR methods in DCF techniques and to Payback in NDCF techniques. WACC is the highest ranked discount rate followed by Cost of debt. Further, a vast majority of
them feel that education and experience play an important role in selection of capital budgeting techniques.

III. The perceptual mapping of the different factors affecting choice of capital budgeting techniques shows that Indian CFOs are of the opinion that ‘importance of project’, followed by ‘experience and competency’, are the most important factors affecting choice of capital budgeting techniques with highest degree of importance, followed by ‘easy understandability’ and the ‘theoretical underpinnings of finance theory’. ‘Familiarity of top management with the method’ and ‘informal rule of thumb’ are considered the least important factors affecting choice of capital budgeting techniques.

9.6.9 CFOs Ranking of Relative Importance, Relative Difficulty and Relative Riskiness of Different Stages of Capital Budgeting

I. CFO also ranked different stages of capital budgeting on the basis of their relative importance. It was found that the Indian corporate sector regards Financial Analysis and Project Selection as the most important stage of capital budgeting followed Project Definition and Cash Flow Estimation. Project Implementation and Project Review were ranked 3rd or 4th by majority of the CFOs in terms of the importance of different capital budgeting stages. It is also noteworthy, that across companies of different capital budget sizes, the response of the CFOs with respect to the relative importance of different stages of capital budgeting were almost similar.

II. Further, CFO’s ranking of the of different stages of capital budgeting on the basis of their level of difficulty shows that Financial Analysis and Project Selection were found most difficult stage followed by Project Definition and Cash Flow Estimation and then the Project Implementation stage. The stage of Project Review turned out to be the least difficult stage. Thus, in India CFOs find Financial Analysis and Selection clearly the most difficult stage. This is probably because Indian CFOs are still not at ease with the understanding and usage of DCF techniques and risk techniques.

III. CFOs’ ranking of different stages of capital budgeting on basis of their riskiness reveal that Financial Analysis and Project Selection turned out to be the most risky stages as perceived by nearly 88 percent of the CFOs followed by Project Implementation by nearly 65 percent of the CFOs. Project
Definition and Cash Flow Estimation was obviously ranked third in risk perception and the Project Review was considered the least risky of all. Thus, in the Indian corporate sector Financial Analysis and Project Selection along with the Project Implementation stage was considered to be still relatively more risky in spite of increase in level of education and experience of the respondents.

IV. Kruskal Wallis Test (H test) was applied to study the impact of company related variables on level of difficulty of capital budgeting stages. Results show that there is a statistically insignificant difference between different sizes of capital budget as regards their CFOs perception of the level of difficulty of different capital budgeting stages at 5 percent level of significance. Thus, size of capital budget of a company, does not affect the level of difficulty of different stages of capital budget. Also, there exists statistically significant difference between the different industry types as regards CFOs perception of level of difficulty of Project Review stage, while for all other stages the differences are insignificant at 5 percent level of significance. Similarly, company age affects CFOs perception of difficulty level faced in Project Definition and Cash Flow Estimation and Project Implementation stages of capital budgeting in which case the results are significant, but not for other stages. Also, there is statistically significant difference, across CEO of different educational classes as regards CFOs ranking of level of difficulty of Financial Analysis and Project Selection stage of capital budgeting, but not for the other stages.

Section II
Capital Budgeting Practices Incorporating Risk in Indian Companies

9.6.10 Nature of Risk, its Measures, Sources and Risk factors

1. Our survey reveals that majority of Indian companies perceive ‘fluctuation in expected return’ as a risk followed by ‘non-recoverability of investment’. However, Information, Communication and Technology sector is an exception where ‘fear of obsolescence’ is also perceived as a prime risk. This is so because in this industry, technology changes are very fast so rate of obsolescence is very high. Further, nearly all the companies’ measure risk while undertaking an investment project and ‘Standard deviation /Coefficient
of variation’ is the most preferred measure followed by ‘Expected NPV using probability distribution’. The results remain more or less similar companies across different capital budget sizes and industry types. This is so because companies probably feel that standard deviation of returns gives an accurate measurement of risk.

II. ‘Competitor risk’, ‘Market risk’ and ‘Project specific risk’ are rated as the most important among the different sources of risk in a project by Indian companies. While smaller companies find Project specific risk more important, the larger companies give more importance to Industry specific risk. ‘Risk of unexpected inflation’, ‘Interest rate risk’ and ‘Foreign exchange risk’ are the three most important risk factors considered by the Indian companies. This is because as per the companies these three risks probably have greater impact on the project’s return in Indian economy. Capital-budget-wise classification shows that Risk of unexpected inflation, Foreign exchange risk, GDP/business cycle risk had higher mean importance for companies with higher capital budget than lower capital budget companies.

III. Most of the companies adjusted Discount rates or Cash flows or both for Interest rate risk (78%) and Risk of unexpected inflation (73%), while the Foreign exchange risk was adjusted by 60% of the companies. Only 40-45% companies made adjustments for Term structure, Commodity price risk whereas GDP or Business cycle risk was adjusted by nearly 36%. For Interest rate risk, Term structure risk, Company size and Momentum risk, majority of the companies adjusted their discount rates. However, for Risk of unexpected inflation, GDP risk, Commodity price risk, Foreign exchange risk, Market to book value risks majority adjusted their cash flows.

9.6.11 Risk Adjusted Capital Budgeting Techniques Preferred by Indian Companies

I. Our survey revealed that the most popular techniques among Indian companies for incorporation of risk are Sensitivity analysis followed by Shorter payback period, Scenario analysis and Conservative estimates of cash flows. Risk adjusted discount rates and Judgment evaluation is also used though not much. Further, overall speaking sophisticated risk adjusted techniques like Sensitivity, Scenario, Simulation analysis and Risk adjusted discount rates are preferred more in
companies with larger capital budget size than the smaller ones which preferred Shorter payback period and Conservative estimates of cash flows. This is because these companies, who have high capital budgets, make huge investments so they need to be more cautious and meticulous in project selection. As a result they adopt sophisticated risk adjustment techniques to avoid a wrong project selection.

II. Moreover, across the different types of industries, risk adjusted techniques of Conservative estimates of cash estimates, Shorter payback period, Risk adjusted discount rate, Sensitivity analysis, and Scenario analysis are used rigorously. Specifically ICT sector, transport sector, chemicals and cement are sectors which prefer high usage of these advanced techniques even Simulation Analysis. In fact the ICT and services sector are making good use of risk adjusted capital budgeting techniques as compared to manufacturing sector. This is because these sectors are exposed to rapid changes and higher risk of technology obsolescence.

III. Risk adjusted discount rates; Shorter payback period and Conservative estimates of cash flows are preferred fairly across all Indian companies of different sales revenue. However the usage of sophisticated techniques of Sensitivity analysis, Scenario analysis and Monte Carlo Simulation increased as the sales revenue increased and these techniques are highly used in companies with higher sales revenue. This is probably because these companies make larger investments and have the availability of well qualified personnel also to implement these highly sophisticated techniques.

IV. Relatively older companies were found to use more of the risk adjusted techniques of Judgment evaluation, Shorter payback period, Risk adjusted discount rate and Simulation analysis while the Conservative estimates of cash flows and DCF break even analysis are preferred more by the younger companies. Sensitivity analysis and Scenario analysis are used rigorously across all companies irrespective of their business tenure. This is because these risk adjusted techniques are considered effective and superior by all companies irrespective of their tenure in business.

V. Indian CEOs irrespective of their educational qualifications, give preference to the risk adjusted techniques of Judgment evaluation, Risk adjusted discount rate, Shorter payback period, Conservative estimates of cash flows. However, the MBA CEOs prefer no specific technique for risk incorporation but make use of the varied risk adjustment techniques in almost equal proportion. The sophisticated
techniques like Sensitivity analysis, Scenario analysis though used by all, are preferred highly by CEOs holding professional degrees (like CA, CS) and by those holding higher qualification even greater than Masters Degree. This is so because these CEOs are highly professional and qualified to use these advanced techniques. The highly sophisticated technique of Monte Carlo Simulation is less preferred across all CEOs, especially those with low educational qualifications. This is probably because these CEOs are less qualified to use this highly sophisticated technique.

VI. In Indian corporate sector, sophisticated techniques of Sensitivity analysis and Scenario analysis are used more by companies for projects relating to Entry in new business and Equipment replacement and modernisation. In case of Expansion of existing business also companies use these techniques but to a comparatively lesser extent. Further, the techniques of Risk adjusted discount rate; Conservative estimates of cash flows, Shorter payback period are also used in investments pertaining to existing business.

VII. Kruskal Wallis H test was applied to find out the association of different company related variables and usage of different risk adjusted capital budgeting techniques. Results show that size of company’s capital budget has a significant relation with only Sensitivity analysis at 5 percent level of significance but the relation is insignificant for all other methods. The usage of Sensitivity analysis method is thus positively correlated with size of capital budget with higher capital budget companies employing more of this technique. Also type/nature of industry has a significant relation only with Monte Carlo Simulation at 5 percent level of significance and with no other risk adjusted capital budgeting technique. Further, there is no significant relationship between different capital budgeting techniques incorporating risk and the size of sales revenue. It has association only with Calculated bail out factor at 10 percent level of significance. However, a significant relation is found between age of the company and usage of the risk adjusted capital budgeting techniques in case applying No formal technique for risk incorporation, Judgement evaluation, Conservative estimates of cash flows, Hiller model, Utility theory, Probability theory, Calculated bail out factor at 5 percent significance level and with DCF Break Even Analysis at 10 percent significance level. It is also revealed that no significant relation is there between usage of risk adjusted capital budgeting technique and CEO education except for Risk adjusted discount rate
where the relation is significant at 5 percent and Sensitivity analysis where it is significant at 10 percent level of significance. A significant association is found between entry into new business investment type and Sensitivity analysis, Scenario analysis, Simulation analysis and Utility theory techniques of risk assessment at 10 percent but not at 5 percent significance level. Also a significant association is found between investment in equipment replacement and modernization and Sensitivity and Scenario analysis techniques at 10 percent and 5 percent significance level respectively. None of these techniques has significant relation with investment in existing business. Similarly, all other risk adjusted capital budgeting techniques has an insignificant relation with the all types of investment.

Section III

Cost of Capital and Equity Capital Practices in Indian Companies

9.6.12 Cost of Capital Practices in Indian Companies

I. Weighted Average Cost of Capital (WACC) was found to be the most preferred method to calculate cost of capital, used by nearly 61 percent companies. This was followed by Cost of debt, preferred by only 17 percent companies. The other methods were rarely preferred.

II. Capital-budget-wise classification also shows that the results remained same across all sizes of capital budgets except in case of companies with capital budgets size below Rs. 50 crores. In these companies WACC and Cost of debt were equally preferred by nearly 32 percent of these companies.

III. These results remained same across all types of industry except in case of chemical/ pharmaceutical and services industry where both WACC and Cost of debt were equally preferred by the companies.

IV. Sales revenue-wise classification also shows that the results remained same across companies of different sales revenue except in case of companies with sales revenue of less than Rs. 100 crore, where vast majority of the companies (nearly 60 percent) preferred Cost of equity using Earnings Yield Model followed by Cost of debt/interest payable on debt.

V. Across different age groups also WACC was the most preferred method for estimating cost of capital followed distantly by Cost of debt. Other methods were less preferred except the Cost of equity capital using Earnings Yield
Model which was somewhat preferred by 14.3 percent of the younger companies (< 20 years age), but not by the older companies (> 20 years age).

VI. These results were also similar across CEOs of different educational qualifications. MBA CEOs, CEOs with professional degree like CA, CS and those having higher qualifications (even greater than masters’ degree) gave WACC even higher preference. Further, in case of CEOs having technical qualification like B.E/B.Tech/M.Tech and those with qualifications even higher than Masters Degree, Cost of debt was preferred by nearly one fourth of the respondents.

VII. Chi-Square test when applied to test association between the different company variables and cost of capital method used by companies showed that a significant relation exists between cost of capital and size of capital budget at 10 percent level of significance. However, an insignificant relation is found between cost of capital and industry type at 5 percent and 10 percent significance levels, respectively. An insignificant relation is also found between cost of capital and company age as well as CEO education at both 5 percent and 10 percent level of significance. Also, Chi-Square test of association between cost of capital and sales revenue reveals a significant relation at 10 percent level of significance. Thus only size of capital budget and sales revenue had a significant relationship with choice of the method used to calculate cost of capital of the company at 10 percent level of significance. Thus, WACC is the method primarily used by Indian companies across different sizes, industries, age groups for calculation of cost of capital followed distantly by the Cost of debt. Further, size of a company, whether in terms of capital budget or sales revenue, is significant variables influencing cost of capital methods in companies. All other variables do not have any significant influence.

VIII. Generally, company’s cost of capital estimates are subject to regular review, more often than on a bi-annual or annual basis. These reviews are generally conducted ‘Quarterly’ or ‘whenever a new project is to be evaluated’ or ‘whenever there is a significant change in the business environment’. The companies do this as they feel that an accurate estimate of cost of capital
helps to take better investment decisions (as it is used as a discount rate or yardstick for comparison in capital budgeting techniques).

9.6.13 Cost of Equity Capital Practices in Indian Companies

I. A vast majority of nearly 79 percent of sampled companies estimated cost of equity capital while 21 percent did not go in for its estimation. Also as the size of capital budget increased, greater number of companies estimated the cost of equity capital with nearly 86 percent of sampled companies with capital budget size greater than Rs.500 crore estimating it. These results remained more or less, same across companies of different types of industry except the companies in services sector (finance/banking/insurance/hotel/construction) in which case a majority of (56 percent) of the companies did not estimate the cost of equity capital.

II. Further, CAPM Model (the Beta Approach) and Dividend yield model are the methods most preferred for its calculation. Also methods of Cost of equity with Average historical returns on common stock, Cost of Equity on basis of investor requirements and CAPM with some extra risk factors are also quite popular. Large size companies in terms of capital budget size and sales revenue preferred CAPM Model (the Beta Approach), CAPM with extra risk factors while smaller companies preferred Average historical returns method, Dividend Yield, Dividend Growth and Earnings yield models. Similarly, older companies preferred CAPM more than younger companies who did not gave high preference to one single method but used all methods to some extent. Further, highly educated CEOs (with greater than masters degree), preferred Dividend Yield model, MBA CEOs, preferred CAPM Model and CEOs with technical degrees (B.E, B.tech, M.tech etc.) or professional degrees (CA,CS), preferred the Average Historical Returns on Common Stock more.

9.6.14 Calculation of Required Rate of Return (ROR) for Investment Projects by Indian Companies

I. Majority of the companies (28.6 percent) calculated Required Rate of Return (ROR) on basis of Ratio of Equity and Debt used to finance the project followed closely by WACC adjusted by Project Specific Risk (23.4 percent). However, an equal proportion of the companies did not make any adjustment
in WACC and used the same overall company’s WACC as the required rate of return.

II. Companies with capital budget (< Rs. 50 crore), calculated the ROR on the basis of Ratio of Equity and Debt used to finance the project but as the size of capital budget increased beyond Rs. 50 crore, companies either adjusted WACC with Project Risk or made use of Ratio of Debt and Equity Financing in the project. However, in companies having capital budget of Rs.100 – Rs.500 crore, as high as 39 percent of the companies used the same overall WACC as of the whole company without making any adjustment of project risk.

III. Industry-wise-classification shows that transport/tyre, food processing/sugar, textile mostly calculated ROR on the basis of ratio of debt and equity used to finance project. Further, the company’s overall Cost of Capital or WACC was used by transport, cement, consumer durable and ICT sectors whereas the chemical/pharmaceuticals, cement and services sector used the WACC adjusted to Project Risk.

IV. The Required Rate of Return of 36 percent companies ranged between 10-14% followed closely by 32 percent companies in which case of range of between 14-18 %. Thus, the ROR of Indian companies of all capital budget sizes generally fell in the range of 10-18 percent. The results across different industry types also reveal that majority of the companies’ preferred a required rate of return of 10-18%. The only exception in this regard is the ICT sector where nearly 62.5 percent companies had a required rate of return in the range of 5-10%.

Section IV

Non Financial Criteria and Factors Affecting Project Selection

9.6.15 Importance of Non-Financial Criteria In Investment Appraisal

I. Our survey reveals that qualitative or nonfinancial criteria play a major and significant role in investment decisions. Indian Companies give due importance not only to financial analysis but also to multiple non financial considerations while selecting an investment proposal. ‘SWOT analysis to fit corporate objectives and strategy’ and ‘Customer market in case of new product/demand analysis’ are found to be highly important non financial
criteria before selecting an investment. Further, ‘Technical considerations’ such as availability of raw material, power, manpower, suitable technology or suitable project location are also considered by most of the companies. ‘Social considerations of employee and public safety’ are also given due importance by Indian Companies. The other non financial criteria that were considered by the respondent companies while making investment decisions were ‘necessity of maintaining existing product lines’ and ‘need to meet competition’. Certain other criteria like country interest/government direction in particular area, government regulation/norms, tax benefits or incentives, environmental constraints, availability of qualified managerial personnel and capacity availability were mentioned by only a few companies as an important non financial criteria affecting their choice of project. Only CEOs of negligible 2.6% of the respondent companies, did not give any consideration to the non financial criteria in project selection.

II. Further, while lower capital budget companies considered ‘SWOT analysis to fit corporate objectives and strategy’ as highly important non financial criteria, the criteria of ‘Customer market in case of new product/demand analysis’ was considered more important by higher capital budget companies.

III. Industry-wise analysis shows that ‘SWOT analysis to fit corporate objectives, and strategy’ was one non financial criteria, which the respondent companies across all industry types (except power, oil, gas) considered while project selection. ‘Safety of public and employees’ and ‘Customer demand analysis’ was found a relevant non financial criteria considered by transport/tyres consumer durable, electrical, FMCG and ICT sectors specifically. Services sector also gave due consideration to ‘Customer demand analysis’. ‘Availability of raw material, manpower and suitable technology’ were found to be important non financial considerations for transport/tyres, consumer durable, electrical, FMCG, chemical/ pharmaceuticals sector. Moreover, in ICT sector ‘Availability of suitable technology’ was also an important consideration. Further the ‘Need to meet competition’ was given due weight age in cement/iron, paper, chemical, fertilizer and pharmaceuticals sector. All of the two power/oil companies and one company in the ICT sector considered ‘Govt direction in particular area for country interest’ and ‘Environmental constraints’ as important considerations in investment
selection. These are public sector enterprises for whom national and public interest as dictated by the government is of prime consideration in selecting an investment project.

9.6.16 Relative Importance of Different Criteria (Financial and Non-Financial) in Project Selection

I. Nearly all the respondent companies reported ‘Increasing Company’s sales revenue and profits’ (financial criteria) as the prime criteria for selecting any project. ‘Market risk’ (changes in macro economic factors like GDP growth rate, business cycle risk, fluctuations in demand, interest rate, inflation rate) and ‘Competitive risk’ (unanticipated actions of competitors) were also rated highly important by a vast majority of companies.

II. ‘Feedback from customers’, ‘Availability of finance’, ‘Competitors’ moves’, ‘Advice from business analyst’, ‘Project specific risk’ were other criteria rated highly important by over four fifth of the companies. Nearly three-fourth of the respondent companies considered ‘Service to community/CSR’, ‘Industry specific risk’ (unexpected technological developments, government policy changes/regulatory changes), ‘Increasing employment’ and ‘Feedback from supplier’ as important criteria affecting project choice. Following this were ‘Repaying debt on time’ and ‘International risk’ (exchange rate risk/political risk), that were given importance by three-fifth of the respondent companies.

‘Intangible benefits of project’ (brand image, customer image, timeliness, task completion, effect on employee morale, teamwork/competitive advantage/improving market share) were also considered important by nearly half of the companies but a considerable percentage of companies were also not clear about the role of these criteria in project selection. This is mainly due to the intangibility associated with these criteria.

9.6.17 Factors (Financial and Non-Financial) Considered in Project Selection

To identify empirically the factors that affect project selection, the Factor Analysis technique was used that reduces the vast number of (financial and non financial criteria) into fewer factors, which explain much of the original data. In total, six factors are identified which affect Project Selection namely:
**Factor 1 - Technical Factors** (Resource Availability) i.e. availability of the necessary resources for the project ranging from availability of finance to raw material, power, labour, infrastructure etc.

**Factor 2 - Stakeholders Expectations and Feedback** i.e. projects ability to meet customer expectations and tackle competitors’ actions in the market.

**Factor 3 - Financial Feasibility** i.e. projects’ contribution in increasing sales growth and profitability of the organisation and thus maximising the market price of its shares.

**Factor 4 - Social Factors** (Social Benefits and Responsibility) i.e. the project’s contribution to society in terms of increasing employment, ensuring safety of public and employees and safeguarding interest of country as a whole.

**Factor 5 - Strategic Alignment** (Intangible Market related Benefits and Risks) i.e. how far the project fits with corporate objectives and strategy, improves brand image, customer image, market share, competitive advantage of the company in the market. Further what is the demand analysis of the project, feedback from suppliers and business analysts in the market about the future project prospects.

**Factor 6 – External Factors** (Industry Specific Risks), like project’s exposure to government policy and regulations, legal laws, unexpected technological changes, and industry’s susceptibility to international exchange rate fluctuations.

Thus, Technical Factors (Resource Availability), Stakeholders Expectations and Feedback, Financial Feasibility, Social Factors (Social Benefits and Responsibility), Strategic Alignment (Intangible Market related Benefits and Risks), and External factors (Industry Specific Risks) are important factors (non financial and financial) considered by Finance Managers before project selection.

**9.7 Agenda for Future Research**

The current research study brings to light the capital budgeting practices (including those incorporating risk) practiced by Indian Companies. It studies the impact of company related variables like size of capital budget, nature of industry, sales revenue, Company age, CEO education and type of investment on choice of
capital budgeting techniques. Further, emphasis is on cost of capital practices and non-financial considerations in investment evaluation. However there is still a lot of scope for future research in the area of capital budgeting.

Several issues are either totally ignored, need to be resolved or remained unanswered. Opportunities are available to researchers like:

- Focusing on a particular stage of capital budgeting process e.g. the relatively unexplored identification stage or the project review/post audit stage.
- Studying the impact of capital budgeting techniques adopted by Indian companies on their corporate profitability.
- Analyzing the effect of inflation on capital budgeting practices.
- Further, in-depth research in the area of real options, offers a rich opportunity for the researchers to track the rationale and the use of this advanced selection technique.