4: Research Methodology

4.1 Introduction
4.2 Research Problem
4.3 Objectives of Research Study
4.4 Rationale of the Study
4.5 Research Design
4.6 Research Methodology
4.7 Data Processing and Analysis
4.8 Definitions of Key Terms
4.9 Relevance of the Study and Conclusion
Chapter 4: Research Methodology

4.1 Introduction:

In this chapter, an attempt has been made to describe the research methodology followed for conducting the study. More specifically, this chapter deals with the research problem, the objectives of the research study, rationale of the study, research design, data processing and analysis and relevance of the study.

4.2 Research Problem:

To evaluate the practices of the Capital Budgeting for evaluation of investment proposals in the corporate sector in India.

4.3 Objectives of Research Study:

The following objectives were set out for the study:

1. To determine the types of capital investments undertaken and the methods of appraisal used.

2. To analyze the problems faced to estimate the cash flows associated with each capital investment accurately.

3. To analyze how ‘Uncertainty’ in the future estimates in investment projects is being taken care of.

4. To assess suitability of Discounted Cash Flow (DCF) Techniques in India.

5. To study the preferences between Net Present Value (NPV) and Internal Rate of Return (IRR) methods.
4.4 **Rationale of the study:**

An attempt in this research has been made to review available literature on capital budgeting practices and also to carry out an empirical study, to work on the research problem pertaining to sound practices in the corporate sector in India.

4.5 **Research Design:**

The research study is essentially of a descriptive in nature, as it describes company’s responses for identified criteria of study relating to capital budgeting practices.

4.6 **Research Methodology:**

In this study the researcher has made use of varying sources of information keeping in mind the cost and time constraints. The major decision with regard to research plan while executing the research study is based on various sources of information as follows.

4.6.1 **Sources of Information:**

Both primary and secondary data were collected for addressing the research problem and fulfilling the objectives of the study.

[A] **Secondary Data:**

The researcher has made use of available articles, books, research studies, reports, data and information from magazines and journals and visit to relevant websites has also been made. The Prowess data base of Centre for Monitoring Indian Economy has been extensively used for secondary data of all companies.

[B] **Primary Data:**

The primary data has been collected from the chief financial executives/finance officers of the selected companies, which are involved in capital budgeting decisions by designing an appropriate questionnaire (Annexure 1).
4.6.2 Research Instrument:

The researcher has made use of a structured non-disguised close-ended and open-ended questionnaire supported by personal interviews with concerned financial executives for collecting necessary primary data. The researcher has also created separate specific e-mail ID to collect data from various companies from the distant places of India so that contacting them as well as for follow up of the response from them become easy, convenient and less time consuming.

4.6.3 Sample design:

The scope of my thesis is limited to manufacturing public limited companies listed on Bombay Stock Exchange, having their investment in total assets equal to or more than Rs. 5 crores. The selection of sample is not without reasons. It is partly to keep the study within manageable limits. Nevertheless, the sample of companies listed on Bombay Stock Exchange, given its national character, can said to be fairly representative as it constitutes hub of the stock market activity in India. Moreover, Bombay Stock Exchange represents a sizeable part of the quoted companies in India. For collecting data from the sample companies the questionnaire was designed and pilot testing of the questionnaire was done from the 4 companies. The changes suggested by the companies selected for pilot testing was incorporated and finally the relevant data were directly collected from the sample companies through the questionnaires sent by mail or through personal visit to the company.

The researcher has selected 28 companies operating in India representing various sectors on the basis of convenient purposive sampling for addressing the research problem.

4.7 Data Processing and Analysis:

The data were processed using the Microsoft Windows Excel. Along with that the mix of appropriate analytical tools and techniques including statistical tables, simple frequency tables, percentages, arithmetic mean, chi square, correlation and regression analysis etc. are used to analyze the data and address the research problem. A brief description of some of the tools and techniques used are as follows:
1. **Literature Review**: This was used to determine the objectives and formulate the research problem. It also supplemented the results of our research. A large number of books, articles, research studies, reports, data and information from magazines and journals were read and drawn upon for the purpose and visit to relevant websites has also been made.

2. **The Statistical Tables**: They are most commonly used tool of presenting the analytical results of research. A typical table consists of the title, the stub, the caption, the body and the source. One-way, two-way, three-way and higher orders of classification of variables can be done using statistical tables. Cross classification tables are very useful for comparison and contrast purposes. Frequency distribution is used to determine the pattern of distribution of selected variables across selected categories/groups. We have used statistical tables extensively.

3. **Arithmetic Mean**: This is a most widely used measure of central tendency of distribution of a random variable. It is computed by adding all the values in a data set and dividing the sum by the number of values. We have used this measure most frequently in our analysis.

4. **The Chi Square**: Statistical test Pearson chi-square test is used for testing the independence between two categorical variables. Chi-square is a quantitative measure used to determine whether a relationship exists between two categorical variables.

5. **The t-Test**: This is used to test: (a) whether the observed difference between selected pairs of means of variables is or is not statistically significant; (b) whether a particular independent variable has a statically significant effect on the dependent variable; and (c) the significance of correlation coefficient and regression coefficients.
6. **Correlation**: This is a technique used to determine the strength of the relationship between two variables. The coefficient of correlation is used as a measure of the strength of the association/relationship between two random variables.

7. **Regression**: This technique is used to estimate the nature and strength of causal (linear) relationship between variables – one of which is called dependent variable and the others independent variable. In simple regression, the relationship is determined between only two variables and in multiple regression between one dependent and more than one independent variables. In the case of simple regression, the extent of variability in the dependent variable that can be explained by the variation in the value of the independent variable is measured by the coefficient of determination denoted by $r^2$.

   In multiple regression, the coefficient of multiple determination denoted by $R^2$ measures the extent of variability in the dependent variable that is explained by the variations in the values of all the independent variables together and also indicate the goodness of fit of the estimated functional form. The **F-test** is used to test whether $R^2$ is statistically significant or not, i.e., whether the regression model is a good fit to the observed data.

4.8 **Definitions of Key Terms:**

**Co-efficient of determination ( $R^2$ ) :**

Measures the strength of the linear relationship between two variables. The value of $R^2$ is equal to +1 whenever the regression model is perfect estimator. Thus an $R^2$ value close to 1 indicates a strong correlation between the variables.

**P-value:**

Probability value (p-value) is the largest significance level at which we would accept the hypothesis. Thus, a p-value of model if within significance level of 0.05 denotes that the regression model as a whole is highly (95 %) significant.
Pearson correlation:

It indicates the strength and direction of a linear relationship between two random variables. In general statistical usage, correlation or co-relation refers to the departure of two variables from independence. The correlation is 1 in the case of an increasing linear relationship, \(-1\) in the case of a decreasing linear relationship, and some value in between in all other cases, indicating the degree of linear dependence between the variables. The closer the coefficient is to either \(-1\) or 1, the stronger the correlation between the variables.

Asset Efficiency Ratio:

The total asset turnover ratio shows the firm's effectiveness to generate sales from using its assets. Companies and investors alike want as high a ratio as possible since there are no negative implications from utilizing too much of a firm's assets to generate revenue.

The asset turnover ratio simply compares the turnover with the assets that the business has used to generate that turnover. The formula for total asset turnover is:

\[
\text{Asset Efficiency Ratios (times)} = \frac{Sales}{Total \text{ Asset}}
\]

Net Profit Margin:

The profit margin tells you how much a company makes for every Re. 1 it generates in revenue. The profit margins vary by industry, but all else being equal, the higher a company’s profit margin compared to competitors, the better. It measures profitability with respect to sales generated i.e. net income per rupee of sales. The formula for net profit margin is:

\[
\text{Net Profit Margin (\%)} = \frac{PAT}{Sales} \times 100
\]
Earning Power:

The Du Pont Company began to use a particular approach to ratio analysis to evaluate the firm’s effectiveness in 1919. One variation of this Du Pont approach has special relevance to understanding a firm’s ROI. According to the approach, when we multiply the net profit margin of the firm by the total asset turnover, we obtain the return on investment (ROI) or earning power on total assets. Neither the net profit margin nor the total asset turnover ratio by itself provides an adequate measure of overall effectiveness. The net profit margin ignores the utilization of assets, and the total asset turnover ratio ignores profitability on sales. The return on investment (ROI) or earning power resolves these shortcomings. An improvement in the earning power of the firm will result if there is an increase in turnover on assets, an increase in the net profit margin, or both.

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\text{Earning Power Ratio (\%) = Asset Efficiency Ratio} \times \text{Net Profit Margin}
\]

4.9 Relevance of the study and Conclusion:

The research findings are expected to be useful to the financial institutions, managers as well as practitioners in the area of investment decision-making. As there are various methods and criteria available, the research studies undertaken so far suggest that by and large decision-makers tend to select methods ignoring time value of money. However, the researcher feels that with development of professionalisation in the financial management discipline and need to adhere to international standards, corporates have started resorting to sound practices. This study will also be useful for postdoctoral research in the area to be undertaken.