CHAPTER – 3

RESEARCH METHODOLOGY

AND

OBJECTIVES OF THE STUDY
The purpose of this chapter is to discuss the methodology used in this study. The chapter is divided into five sections. Section 3.1 discusses the objectives and hypotheses and section 3.2 deals with statistical tools used. Measures of different variables are discussed and in section 3.3 and section 3.4 deals with sample selection and limitations of the study. Section 3.5 shows the plan of the study.

3.1 Objectives of the Study

The basic objective of the study was to find out how Indian companies determine their optimal capital structures, but since they are operating in an imperfect market and have no specific model or mechanism to determine it, the study was undertaken to determine whether an optimal capital structure exists both at micro level and macro level. Besides, the study has some other objectives also which are as follows:

1. To analyse the effect of capital structure on value of firm.
2. To determine the effect of cost of capital on value of firm.
3. To examine the effect of cost of capital on capital structure.
4. To analyse the combined effect of cost of capital and capital structure on value of firm.

Hypotheses:

The main objective of the study was to find out how Indian private sector companies determine their optimal capital structures. But owing to the facts that they operate in an imperfect market, have no specific model or mechanism to determine it, so the present study aimed at micro and macro level. Besides it has some sub-objectives namely (i) to find the relationship between cost of capital, capital structure and value of firm (ii) to find the significance of differences in capital structures of different companies – inter and intra industry.

Hypothesis-1

$H_{01} =$ There is no significant relation between cost of debt, cost of equity, cost of overall capital, debt to equity ratio and debt to capital ratio and market price of shares at micro level.
Hypothesis-2

\[ H_{02} = \text{There is no significant relation between cost of debt, cost of equity, cost of overall capital, debt to equity ratio and debt to capital ratio and market price of shares at macro level.} \]

Hypothesis-3

\[ H_{03} = \text{There is no significant relation between cost of overall capital and capital structure.} \]

Hypothesis-4

\[ H_{04} = \text{There is no significant relation between cost of overall capital and value of firm.} \]

Hypothesis-5

\[ H_{05} = \text{There is no significant relation between capital structure and value of firm.} \]

Hypothesis-6

\[ H_{06} = \text{There is no significant difference between capital structure of companies belonging to same industry group but companies belonging to different industry groups show significant variations.} \]

3.2 Statistical Analysis

In their works, M-M asserted that when the capital market is perfect, value of a firm is independent of its capital structure. When corporate taxes exist and interest payments are tax exempted, there exists on optimal capital structure which is determined by the trade off between tax advantages of debt and the disadvantages associated with.

Some empirical studies have been done to find out the effect of capital structure on cost of capital. However not much systematic work has been done on the proposed topic so far. The present study is a humble attempt to determine an optimal capital structure in an imperfect market.

It should, however, be noted at the outset that there are many statistical problem that make the determination of optimal capital structure a formidable task. The first and major
problem is to identify those explanatory variable which, in one way or other, influence the market value of the firm. The second problem relates to the measurement of variables.

The market value of a firm is influenced by a number of factors many of which are not measurable as they are qualitative in nature. It is not possible to measure the magnitude and effects of factors like reputation of promoters, management of the company, economic and political conditions, roles of bulls and bears in the stock market and government policies etc.

The third problem is the statistical problem. Since the value of a firm is dependent upon a number of factors whose effects cannot be segregated, so a model showing the exact relationship between capital structure and value of a firm can’t be developed.

So, in the absence of a well defined model on optimal capital structure, bivariate correlation technique was used to find the nature of relationship between (i) capital structure and cost of capital, (ii) cost of capital and value of the firm and (iii) capital structure and value of the firm. Then, t-test was applied to test the significance of coefficient of correlation. F-test was applied to test the significance of difference in capital structure.

3.3 Measure of Variables

The variables used in this study are as follows:

1. Market value of Equity (E):

\[ E = \text{No. of shares outstanding at the end of an accounting year} \times \text{Average market price per share} \]

Where No. of share= total equity capital/face value per share

Average price= mean value of monthly high and low price/share during the accounting year.

2. Total Market Value (V): It is given by

\[ V = \text{Market value of equity} + \text{Book values of preference share capital and debt.} \]

Preference shares and debt are taken at book value because there is no significant yearly fluctuations in the prices of these sources of capital.
3. Cost of capital (Ka)

As we know that Ka represents the weighted average of all the component costs, so it is determined as

\[
Ka = \frac{Kp \cdot P + Kd \cdot D + Ke \cdot E}{P + D + E}
\]

Where

- Kp, kd and ke are costs of preference capital, debt and common stock (equity) respectively.
- P, D and E are the market values of preference capital, debt and common stock respectively.

The various costs were calculated as follows:

(i) Cost of preference capital (Kp)

\[
Ka = \frac{\text{Preference dividend}}{\text{Price of preference share}}
\]

(ii) Cost of debt (Kd)

\[
Kd = \frac{\text{Interest paid}}{\text{Total debt}} + (1 - t)
\]

\[
= \frac{I}{D} (1 - T)
\]

Where T is the corporate tax rate.

(iii) Cost of equity (Ke)

Ke was calculated, using capital asset pricing model, as follows:

\[
Ke = \text{Rf} + \beta (\text{RM} - \text{Rf})
\]

Where \( \beta = \text{Beta Co-efficient} \)

\( \text{Rf} = \text{risk free rate} \)

\( \beta \) represents the systematic risk associated with security. It’s value is calculated as
$$\beta = \frac{Cov. (R_f, R_m)}{Var (R_m)}$$

Rm= Return on the market portfolio

4. Leverage

The most commonly used measures of leverage are:

(i) ratio of debt to equity (L1)

(ii) ratio of debt to total capital (L2)

Thus \( L_1 = \frac{D}{E} \) and \( L_2 = \frac{D}{D+E} \)

Their relationship can be shown as:

\[
L_1 = \frac{L_2}{1 - L_2} \quad \text{and} \quad L_2 = \frac{L_1}{1 + L_1}
\]

Out of the two measures, shown above, \( L_2 \) will be used for empirical analysis, because when all debt situation reaches, \( L_1 \) will not have any meaningful value but \( L_2 \) will have as shown below:

When \( D=0 \) (E100%) \( L_1 = 0 \) and \( L_2 = 0 \)

When \( D=100\% \) (E=0) \( L_1 = \infty \) and \( L_2 = 1 \)

3.4 Sample Selection

In order to test the hypotheses, 30 companies listed on BSE Index were selected in the sample. The study is not limited to a particular industry group. So they have different characteristics. The data for a 10 year period (2001-02 to 2010-11) are used. The main source of secondary data is Capitaline plus database. The criteria for selecting the sample firms were;

(1) Availability of data on the market price of share and other financial data for all the 10 years;

(2) The company must be listed on BSE.

So, on this basis, seven companies have been excluded. Four of them are banks and three are excluded due to non-availability of data for the last 10 years.
Primary data was collected through a questionnaire, mailed to the sample companies through post and e-mail. The questionnaires were sent to all 30 companies but since their response was poor, so the officials were contacted personally. In this manner, the data could be collected for a total 12 companies. Thus the response rate works out to be 40%.

The industry wise breakup of the companies is as follows:

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Type of Industry</th>
<th>No. of Sample companies</th>
<th>Nos. of Companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Telecom</td>
<td>1 each</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Capital Goods, FMCG, Healthcare, Power</td>
<td>2 each</td>
<td>8</td>
</tr>
<tr>
<td>3</td>
<td>Information Technology, Oil &amp; Gas</td>
<td>3 each</td>
<td>6</td>
</tr>
<tr>
<td>4</td>
<td>Metal, Metal (Products &amp; Mining), Transport Equipment</td>
<td>4 each</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td><strong>Total Companies</strong></td>
<td><strong>23</strong></td>
<td></td>
</tr>
</tbody>
</table>

The market value equity, total market value, cost of capital, debt to total capital ratio, debt equity ratio, cost of debt, cost of equity capital have been computed for each year from 2001-02. The hypotheses have been tested using the information obtained from this analysis.

**Limitation of the study**

The values of independent and dependent variables have been computed using the accounting data. The main defect of this data is that different companies’ uses different accounting practices for determining the profits and valuing assets, which may not conform to economic principals. Further the accounting period may not be the same for all companies. These factors cause some problems in interpreting the results obtained. In spite of these limitations, accounting data may be said to represent the best available information used by the decision makers and investors.
3.5 Plan of the Study

The study has been divided into 5 chapters. Chapter 1 deals with the introduction of the corporate finance and Chapter 2 presents a brief review of the work done relating to the research problem. Chapter 3 discusses the research methodology while chapter 4 talks about the relationship between cost of capital, capital structure and value of the firm. Chapter 5 shows major conclusions and suggestions.