CHAPTER – 3

RESEARCH METHODOLOGY

3.1 RESEARCH METHODOLOGY

Research Methodology provides information about the manner in which research has been carried out. Research Methodology describes the procedure followed by the researcher. Research Methodology is a systematic way to solve the research problem. It deals with all the necessary steps that a researcher has to take to carry out the research or steps taken towards problem-solving. The attempt of evaluation of the Indian companies from different sectors has been done in the said research work. A thorough analysis of impact of Financial Leverage on the Financial Performance has been carried out. The ‘financial performance’ has been defined using four important pillars of performance. The pillars are Profitability, Liquidity, Solvency and Efficiency.

3.2 RESEARCH OBJECTIVES

The research work focuses on the bearing that leverage has on the companies’ profitability, liquidity, solvency and efficiency. It clearly aims to serve the following objectives;

(1) To study the theoretical aspects of Financial Leverage and Profitability, Liquidity, Solvency and Efficiency.

(2) To examine relationship between Financial Leverage and Profitability of selected industries and to investigate the actual impact of Financial Leverage on the Profitability of selected industries.

(3) To examine relationship between Financial Leverage and Liquidity of selected industries and to investigate the actual impact of Financial Leverage on the Liquidity of selected industries.

(4) To examine relationship between Financial Leverage and Solvency of selected industries and to investigate the actual impact of Financial Leverage on the Solvency of selected industries.
To examine relationship between Financial Leverage and Efficiency of selected industries and to investigate the actual impact of Financial Leverage on the Efficiency of selected industries.

3.3 **HYPOTHESIS**

1. There is no relationship between Financial Leverage and Profitability of selected industries and no impact of Financial Leverage on the Profitability of selected industries.
2. There is no relationship between Financial Leverage and Liquidity of selected industries and no impact of Financial Leverage on the Liquidity of selected industries.
3. There is no relationship between Financial Leverage and Solvency of selected industries and no impact of Financial Leverage on the Solvency of selected industries.
4. There is no relationship between Financial Leverage and Efficiency of selected industries and no impact of Financial Leverage on the Efficiency of selected industries.

3.4 **SOURCES OF DATA**

**Primary Data**

Primary data refers to that data which has been obtained by the researcher directly from the respondents for specific research work.

**Secondary Data**

Secondary data refers to that data which is already in existence and someone has obtained for specific purpose but reutilize by the researcher. The said research work is based on the secondary Data of published financial statement of selected Indian industries and the selected companies within them. (1) The data of various financial parameters have been obtained from the Annual Reports of the companies directly from the official web sites of the company or stock exchange website. (2) The resources at CMIE (Centre For Monitoring Indian Economy) have also been utilised for the same purpose.
3.5 **SAMPLING METHOD**

Seven industries have been selected for the study on the basis of their influence on Indian Economy. Agrochemicals, Auto Parts & Equipment, Cement Industry, Heavy Electrical Equipment, Iron and Steel, Pharmaceutical Industries, Power/ Electric Utilities are seven sectors under the scan for the performance evaluation in the research work. There are 5,000 plus companies representing different industries listed on the Bombay Stock Exchange and categorised into different groups such as A, B, S etc. This study attempts to assess, observe and analyse the impact of leverage on the selected companies which are grouped differently and which represent booming industries. All companies have been divided into three groups A, B and C. The last group C represents those companies which are listed in the S category on the Bombay Stock Exchange.

For the purpose of this research, the companies listed on BSE have been selected as it is the world’s no.1 stock exchange in terms of average no. of transactions handled in a day. There are tough rules and regulations for listing of a security on BSE. BSE being 135 years old and ISO 9001-2000 certified is the most revered stock exchange and a hallmark of quality, reliability and unbiased and independent assessment of securities. It truly has its fingers on the pulse of the peoples’ perceptions and stock movements and market sentiments and undercurrents. The selection of top 7 industries has been based on their influence on the Indian economy and their contribution to the Indian economy. This research work is based on eleven years’ data (2002-2012) of seventy nine companies.

3.6 **TIME PERIOD**

The study covers time span of eleven years from 2002 to 2012.

3.7 **TOOLS & TECHNIQUES**

The performance of the companies has been examined on the basis of Profitability, Liquidity, Solvency and Efficiency. All the four being dependent variables, whereas Financial Leverage has been used as an independent variable.
3.8 ANALYSIS

To examine the result for determined objectives of the study two techniques are used to analyse compiled data – (1) Accounting analysis (2) Statistical analysis.

3.8.1 ACCOUNTING ANALYSIS:

For accounting analysis ratio analysis has been used.

Ratio Analysis

The term ‘ratio’ refers to the mathematical relationship between any two inter-related variables.

According to J. Batty, Ratio can be defined as “the term accounting ratio is used to describe significant relationship which exists between figures shown in a balance sheet and profit and loss account in a budgetary control system or any other part of the accounting management.”

As per Myers, “Ratio analysis is a study of relationship among various financial factors in a business.”

A ratio is a relationship expressed between two different figures of the financial statement. Ratio analysis is an art of determining relationship between different components of financial statement so as to derive a meaningful understanding of profitability, liquidity, solvency and efficiency of a Company.

Profitability

Profitability can be measured in different ways- like income based, expense based and investment based. This study is based on income based ratios and is confined to four ratios which are as follows:

Earning profit is one of the objectives of every business concern. A company must have sufficient profits in relation to the capital employed by it. Profitability of a company is indicated by the amount of profits earned in comparison to capital invested in business. Profitability is to be examined with reference to sales and capital employed.

- Operating Profit Margin(%) : Operating Income / Sales * 100
Operating margin is a measurement of what proportion of a company's revenue is left over after paying for variable costs of production such as wages, raw materials, etc. A healthy operating margin is required for a company to be able to pay for its fixed costs, such as interest on debt.

- **Profit Before Interest And Tax Margin(%) :** \( \frac{PBIT}{Sales} \times 100 \)
  
  In other words, EBIT is all profits before taking into account interest payments and income taxes. An important factor contributing to the widespread use of EBIT is the way in which it nulls the effects of the different capital structures and tax rates used by different companies. By excluding both taxes and interest expenses, the figure hones in on the company's ability to profit and thus makes for easier cross-company comparisons.

- **Gross Profit Margin(%) :** \( \frac{(Sales - COGS)}{COGS} \times 100 \)
  
  A financial metric used to assess a firm's financial health by revealing the proportion of money left over from revenues after accounting for the cost of goods sold. Gross profit margin serves as the source for paying additional expenses and future savings. COGS expands to Cost Of Goods Sold.

- **Net Profit Margin(%) :** \( \frac{Net Profit (after Interest & tax)}{Sales} \times 100 \)
  
  Profit margin is very useful when comparing the performance of various companies whether they belong to the same industries or different industries. A higher profit margin indicates a more profitable company that has better control over its costs compared to its competitors.

**Liquidity**

Liquidity implies the short term flexibility of a company in payment of obligation. To examine availability of current asset and liquidity of the Company following two ratios are calculated with following formula:

- **Current Ratio :** \( \frac{Current Assets}{Current liabilities} \)
  
  It helps to assess the short term financial position of the business enterprise. It shows how many times Current Assets are in excess of Current Liabilities. Higher the Current ratio, greater is the rupee available for the purpose of current liability, more is the Company’s ability to meet its current obligations and greater is the safety of Company’s short term creditors.
• Quick Ratio: (Current Assets - Inventories) / Current Liabilities

This ratio is an indicator of a company’s short-term liquidity. The quick ratio measures a company’s ability to meet its short-term obligations with its most liquid assets.

Solvency

The measurement of solvency can be done on the basis of relationship of different variables of balance sheets.

The debt coverage ratio is used to determine a company’s ability to generate enough income in its operations to cover the expense of a debt. On a broader level, it may also be used internally by a company for the same reason.

• Interest Cover: EBIT / Interest Expenses

A ratio used to determine how easily a company can pay interest on outstanding debt. The interest coverage ratio is calculated by dividing a company's earnings before interest and taxes (EBIT) of one period by the company's interest expenses of the same period.

• Financial Charges Coverage Ratio: Earnings Before Interest and Tax plus finance charges / interest plus finance charges.

It is a ratio that indicates a firm's ability to satisfy financing expenses, such as interest and leases.

• Debt Equity Ratio: Total Liability / Shareholder's Equity

It is a measure of a company's financial leverage calculated by dividing its total liabilities by stockholders' equity. It indicates what proportion of equity and debt the company is using to finance its assets.

• Long Term Debt Equity Ratio: Long-term debt / (Preferred stock + Common stock)

It shows the proportion of long term debt and shareholder funds. A high debt equity ratio shows that the owners are employing relatively less fund of their own which is all the more an alarming situation for creditors. With small
financial stake in the Company indicates higher risk. At the same time it indicates lower use of financial coverage.

Efficiency

Efficiency ratios measure the effectiveness and efficiency with which there sources available to the company are utilized or the assets of the firm are being used and managed. These ratios establish the relationship between operating activity/sales and various types of current assets and fixed assets. This ratio shows how quickly an item of stock or total assets are being moved over during the periods.

- **Inventory Turnover Ratio**: COGS / Average Inventory

  It indicates the number of times inventory is replaced during the year. It shows the relationship between the cost of goods sold and the inventory level. A lower the inventory turnover ratio reflects stagnant business and more than required investment in stocks. Cost of goods sold is calculated from all the expenses mentioned in the profit and loss account.

- **Investments Turnover Ratio**: Sales / Total Net Worth

  The investment turnover ratio is computed by dividing the year to date net sales by the total net worth of the dealership. This is used to determine how many times the investment or net worth of the dealership is turned into net sales dollars.

- **Asset Turnover Ratio**: Sales/ Total Assets

  This ratio indicates the efficiency of management as regards utilisation of the total assets. The higher the Assets turnover ratio the greater the efficiency regarding utilisation of assets and vice versa is also true.

3.8.2 **STATISTICAL ANALYSIS:**

To arrive at more accurate results of analysis and to get precise observation, the application of statistical tools is considered authentic analysis.

To understand the relationship between Financial Leverage and various components of Financial Performance viz. profitability, liquidity, solvency and efficiency, Correlations and Regression Analysis as statistical tools have been used. To check
correlation of ratios of selected company using correlation function through SPSS 18 edition at 95% level of confidence. To undertake statistical analysis all selected ratios of all parameters are not used. Only important ratio of each parameter is used for this analysis.

TABLE – 3.1
PARAMETERS

<table>
<thead>
<tr>
<th>Sr No</th>
<th>Parameters</th>
<th>Ratios</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Profitability</td>
<td>Net Profit Ratio</td>
</tr>
<tr>
<td>2</td>
<td>Liquidity</td>
<td>Current Ratio</td>
</tr>
<tr>
<td>3</td>
<td>Solvency</td>
<td>Interest Cover Ratio</td>
</tr>
<tr>
<td>4</td>
<td>Efficiency</td>
<td>Total Assets Turnover Ratio</td>
</tr>
</tbody>
</table>

The following statistical formulas have been used for statistical analysis:

\[
\sum_{xy} = \text{Correlation Coefficient between } x \text{ & } Y
\]

\[
= \frac{\sum xy - n \bar{x} \bar{y}}{\sqrt{\sum x^2 - n \bar{x}^2} \sqrt{\sum y^2 - n \bar{y}^2}}
\]

Regression equations of \( y \) on \( x \):

\[
y = \bar{y} + byx (x - \bar{x})
\]

\[
= (\bar{y} - byx \bar{x}) + byx X
\]

\[
y = a + bx
\]

where \( a = \bar{y} - byx \bar{x} \)

\[
b = byx = \frac{\sum xy - n \bar{x} \bar{y}}{\sum x^2 - n \bar{x}^2}
\]

UTILITY OF THE STUDY

- The study provides an in-depth analysis of all the companies’ financial position thereby reflecting the concerned industry’s financial position which enables the
existing and potential investors and creditors to take investment and lending decisions.

- This study can clearly serve as a torch bearer to the retail investors and help them decide and zero in on a particular industry or a company for parking their funds.
- The study focuses on the management's ability to manage Profitability, Liquidity, Solvency and Efficiency vis-à-vis Financial Leverage.
- It can provide a decision making framework for the government to determine any policy for the benefit of specific industry or industries which has/have been examined.

3.9 LIMITATIONS

Critical points related to the research work from different viewpoints have been mentioned as under:

1. The accuracy of the study depends upon the accuracy of the financial data of the respective company. Thus this study carries such limitation.
   a. The study covers only financial information and ignores completely qualitative aspects. Hence performance valuation of the company from qualitative aspects has been ignored.
   b. The ratio analysis is the study of past financial records of the company. Such past records may or may not prove to be useful for future decision-making.
   c. Different companies adopt different accounting methods in respect of depreciation, valuation of closing stock, provision of debt etc. This can adversely affect their uniformity and comparability. The Price level fluctuation can't be ignored in the above study.
   d. Only 7 industries are selected for analysis purpose i.e. performance measurement.
   e. Financial analysis is based on selected accounting ratios.
   f. The use of statistical techniques was restricted to Correlations and Regression Analysis.
2. Field of study is limited to only Indian industries and the companies belonging to them. There are so many other companies in foreign countries which may be considered for analysis. But since the study is limited to Indian industries, only Indian listed companies have been selected for the study.

3. The analysis of impact of financial leverage on financial performance is confined only to seven industries and the leading companies within them. The companies have been segregated into Group A, B and C. However, group wise analysis of impact of financial leverage on financial performance has not been carried out and has been kept open for further investigation.

4. There are numerous stock exchanges in India at national and regional level like, National Stock Exchange (NSE), Bombay Stock Exchange (BSE), Ahmadabad stock exchange, Delhi stock exchange, Vadodara stock exchange etc. but out of them, NSE, BSE have been selected for selection of listed companies, because they are leading stock exchanges in India and most of the national as well as regional companies are listed under them.

5. The country’s economy was liberalised only in the previous decade and its effects are prominently visible in the current decade and hence the period of latest 11(2002-2012) years has been selected for the research.

6. For the research work primary and secondary data can be used but considering the nature of this research work only secondary data are used.

7. A company's profitability, liquidity, solvency and efficiency may be affected by numerous factors but in this research work the impact that Financial Leverage has on them has been analysed.

8. For this research work, the impact of Financial Leverage has been studied with regard to the profitability, liquidity, solvency and efficiency of the selected Indian companies from seven different industries. Financial Leverage may have several other effects on a company which are beyond the purview of this research.