CHAPTER – III
RESEARCH METHODOLOGY

3.1 INTRODUCTION

The word research is composed of two syllables, re and search. ‘Re’ is a prefix, meaning again, anew or over again whereas ‘search’ is a verb meaning, to examine closely and carefully, to test and try, or to probe.

Together they form a noun describing a careful, systematic, patient study and investigation in some field of knowledge, undertaken to establish facts or principles. Research is a search for knowledge. It is a scientific and systematic search for pertinent information on a specific topic. It is an art of scientific investigation. Research is a structured enquiry that utilizes acceptable scientific methodology to solve problems and create new knowledge that is generally applicable. Scientific methods consist of systematic observation, classification and interpretation of data. Although we engage in such process in our daily life, the difference between our casual day- to-day generalization and the conclusions usually recognized as scientific method lies in the degree of formality, rigorousness, verifiability and general validity of latter.

According to Clifford Woody research comprises defining and redefining problems, formulating hypothesis or suggested solutions; collecting, organizing and evaluating data; making deductions and reaching conclusions; and at last carefully testing the conclusions to determine whether they fit the hypothesis. ¹

Research is an original contribution to the existing stock of knowledge making for its advancement. The purpose of research is to discover answers to questions through the application of scientific procedures. The main aim of research is to find out the truth which is hidden and which has not yet been discovered. There are various types of research like descriptive versus analytical research, applied versus fundamental research, quantitative versus qualitative research, conceptual versus empirical research, etc. In social science and business research we quite often use the term Ex post facto research for descriptive research studies. In this method the researcher has no control over the variables; he can only report what has happened. It also includes
attempts by researchers to discover causes even when they cannot control the variables.

The research process is similar to undertaking a journey. For a research journey there are two important decisions to make: What you want to find out about and How to go about finding their answers. There are practical steps through which you must pass in your research journey in order to find answers to your research questions. The path to finding answers to your research questions constitutes research methodology.

The research process consists of a series of actions necessary to effectively carry out the research. The research conducted included the following steps:

1. Formulating the Research Problem
2. Extensive Literature Review
3. Developing the objectives
4. Hypotheses of the study
5. Time period of the study
6. Research design
7. Research tools
8. Sources of data collection
9. Classification and analysis of data
10. Plan of the thesis
11. Implications of the study
12. Limitations of the study

3.2 FORMULATING THE RESEARCH PROBLEM

There are two types of research problems. i.e. those which relate to states of nature and those which relate to relationships between variables. There are two steps involved in formulating the research problem; understanding the problem thoroughly and rephrasing the same into meaningful terms from an analytical point of view.

The beginning of 2005 signaled a new era in India’s protection of intellectual property rights, particularly in the area of pharmaceuticals. The new regulations in the works for more than a decade fulfilled a commitment to adapt India’s laws to global standards of patent protection established by the World Trade Organization in 19915. Since the adoption of the new patent regulations, the Indian pharmaceutical industry
has been undergoing a transformation – a fundamental change in the strategies of domestic pharmaceutical companies. There is a growing consolidation and competition in the Indian pharmaceuticals market. As more MNCs enter the Indian market, and as Indian firms consolidate, brand recognition is increasing. With MNCs planning to spend greater amounts on branding and physician education events, Indian firms will also have to spend much more on R&D and marketing efforts to build their brands. As the Indian middle class continues to grow, it will likely demand more-sophisticated drug choices. In the changed scenario, there would be definitely an effect on the profitability of the pharmaceutical firms. With increased involvement in R&D and such other expenditures there must be an increased need of capital.\(^2\) Thus, the study was undertaken to find out whether there was any change in the capital structure and profitability of the pharmaceutical firms. Gujarat has four pharmaceutical manufacturing clusters at Ahmedabad, Vadodara, Ankleshwar and Bharuch-Vapi-Valsad belt.\(^3\) Being home to around 3,500 drug manufacturing units, Gujarat is one of the country’s most enterprising states in the pharmaceutical sector. It boasts of 42 percent share of India’s pharmaceutical turnover and 22 percent share of exports.\(^4\)

There is hardly any aspect of our life that remains untouched by engineering today.

Engineering industry is the pre-requisite of industrialization of a society or a nation as it portrays the capability to add value to primary products in our economical world of today where trade has replaced war and finance has replaced arms. Due to these basic reasons the research was undertaken in the selected pharmaceutical and engineering firms.

### 3.3 EXTENSIVE LITERATURE REVIEW

Literature review is an integral part of the entire research process and makes valuable contribution to every operational step. It is essential to acquaint oneself with the available body of knowledge. Review of literature brings clarity and focus to the research problem. It helps in understanding the subject better and helps in conceptualizing the research problem clearly and precisely. It also helps the researcher to understand the relationship between the research problem and the body of knowledge in the area. It tells you if others have used procedures and methods similar to the ones that you are proposing, which procedures and methods have worked well for them, and what problems they have faced with them. For the purpose
of literature review various indexing journals, academic journals, conference proceedings, government reports, books etc. can be tapped depending on the nature of the research problem.

The present research tried to study the capital structure of the selected units in the pharmaceutical and engineering sector. There was a vast pool of knowledge that contributed to the study of capital structure. The literature review was done in two different contexts. The literature related to the international as well as Indian context was reviewed. Literature was reviewed with the help of journals, books, e-resources.

### 3.4 DEVELOPING THE OBJECTIVES

Objectives inform a reader what one wants to attain through the study. It is extremely important to word them clearly and specifically. Objectives should be listed under two headings, the main objectives and the sub-objectives. The main objective is an overall statement of the thrust of the study. It is also a statement of the main associations and relationships that one seeks to discover or establish. The sub-objectives are the specific aspects of the topic that one wants to investigate within the main framework of the study.

There are different viewpoints on the impact of the debt-equity mix on the shareholder’s wealth. There is a viewpoint that strongly supports the argument that the financing decision has major impact on the shareholder’s wealth, while according to others, the decision about the financial decision is irrelevant as regards maximization of shareholder’s wealth.

The main objective of the study was to make a critical study of the capital structure of selected units in Gujarat.

After studying the various viewpoints and theories the following sub-objectives were framed for the study:

1. To make an in-depth study of the capital structure pattern in selected industries.
2. To make a comparative analysis of capital structure in selected industries.
3. To examine the variations in the debt-equity ratio and their corresponding variations in the earnings per share.
4. To study and analyze the relationship between the capital structure decisions and profitability of selected companies.

5. To make suggestions for further improvements in the capital structure of the selected units.

3.5 HYPOTHESES OF THE STUDY

A researcher does not know about a phenomenon, but he has a hunch to form the basis of certain assumption or guesses. One tests these by collecting information that will enable to conclude if the hunch was right. The verification process can have one of the three outcomes. The hunch may prove to be right, partially right or wrong. Without this process of verification, one cannot conclude anything about the validity of the assumption.

Hence, a hypotheses is a hunch, assumption, suspicion, assertion or an idea about a phenomenon, relationship or situation, the reality or truth of which you do not know. A researcher calls these assumptions/ hunches hypotheses and they become the basis of an enquiry. A well developed hypothesis is very important since it provides the focal point for research. Hypotheses should be very specific and limited to the piece of research in hand because it has to be tested.

Based on the study of the literature related to capital structure and on the basis of the objectives of the study the following hypotheses were framed:

1. Variations in capital structure would have an impact on the earnings per share.

2. The proportion of debt and equity in the capital structure affects the profitability of the company.

3.6 TIME PERIOD OF THE STUDY

A period of five years from 2005-06 to 2009-10 was selected for studying the capital structure of the selected units. The data for all the five years for the selected pharmaceutical and engineering units in Gujarat was available.
3.7 RESEARCH DESIGN

After the research problem is formulated, a researcher has to prepare a research design. Research design is said to be a conceptual framework within which research would be conducted. It provides the blueprint for the collection, measurement and analysis of data. It provides for the collection of relevant evidence with minimal expenditure of effort, time and money. The purposes of research may be categorized as exploration, description, diagnosis and experimentation. There are several research designs like experimental and non-experimental hypotheses testing. The research design includes geographical areas, population and sample, research tools, procedure of data collection, methods and tools of analysis.

The overall economic climate of the nation affects the capital structure of a company. Individual units always strive to grow year by year. Information would be required to study the internal financial policies and ultimate performance of the selected units in terms of various financial parameters. All the required data collected was studied in detail and conclusions were drawn through scientific analysis and interpretation.

3.8 RESEARCH TOOLS

The tools which are used for the purpose of research vary from study to study. It depends upon the type of study that is conducted. If the study is based on experiments one has to make use of scientific and standardized tools. In case of research related to social science observations have to be supported by secondary data.

The present study is based on secondary data collected from the annual reports of the selected units. The data collected was analyzed in order to draw meaningful conclusions. The analysis of the data undertaken using the accounting and statistical tools. The data was analyzed with the help of Excel and SPSS. Ratio analysis was the accounting tool that was used for the purpose of the present study.

The following ratios were used for the study:

- Debt-Equity Ratio was used to ascertain the soundness of the long-term financial policies of the company.
- Interest Coverage Ratio was calculated to test the firm’s debt-servicing capacity.
• Fixed Assets Ratio showed whether the firm raised adequate long-term funds to meet its fixed assets requirements.

• Net Profit Margin was calculated to indicate management’s efficiency in manufacturing, administering and selling the products. This ratio is the overall measure of the firm’s ability to turn each rupee sales into net profit.

• The Operating Profit ratio was used to measure the overall operating efficiency, incorporating all of the expenses of ordinary, daily business activity.

• The Return on Capital Employed ratio was calculated because it is an important profitability ratio as it measures the efficiency with which the company is managing its investment in assets and using them to generate profit. It measures the amount of profit earned relative to the firm’s level of investment in total assets.

• Return on Net Worth was used to indicate how well the firm had used the resources of owners.

• Earning per share was found out to measure the profitability of shareholders’ investment.

For the purpose of study the following statistical techniques were used:

• Analysis of Variance (ANOVA) is used to test the differences among the means of the populations by examining the amount of variation within each of the samples, relative to the amount of variation between the samples. ANOVA was used to test the mean values of different variables.

• Trend analysis refers to the concept of collecting information and attempting to spot a pattern, or trend, in the information. In some fields of study, the term "trend analysis" has more formally-defined meanings. In statistics, trend analysis often refers to techniques for extracting an underlying pattern of behavior in a time series which would otherwise be partly or nearly completely hidden. A simple description of these techniques is trend estimation, which can be undertaken within a formal regression analysis.
• F-test is used to compare the precisions of two of data, the results of two different methods.

• t-test was applied to compare the mean value of a sample with some standard value and to express some level of confidence in the significance of the comparison.

3.9 SOURCES OF DATA COLLECTION

The task of data collection begins after a research problem is defined and research design is chalked out. Data can be collected from two sources i.e. primary and secondary source. The primary data is the one which is collected for the first time i.e. directly from the respondent and thus it happens to be original in character. The secondary data is the one which is collected by someone else and which has already been passed through the statistical process. The source of data collection depends on the research problem.

The present study was based on secondary data. The major source of information was the secondary data which was collected from Annual reports of the selected companies from 2005-06 to 2009-10. Further information was collected from Centre for Monitoring Indian Economy (CMIE) reports, various magazines, journals, research publications, Capital Market Line report, websites, etc.

3.10 CLASSIFICATION AND ANALYSIS OF DATA

After the data was collected, the next task was to analyze the same. The analysis of data requires a number of closely related operations such as establishments of categories, the application of these categories to raw data through coding, tabulation and then drawing statistical inferences. In the present study, the data collected from annual reports was categorized into two categories; the data related to the balance sheet and that related to the profit and loss account. Thereafter the entire data was tabulated as per the need of the analysis. Ratios were calculated using the tabulated data with the help of excel. Further analysis of the data was done with the help of statistical tools.
3.11 PLAN OF THE THESIS

The final step after the data analysis is the interpretation of the results and report writing. This has to be done very carefully, otherwise misleading conclusions may be drawn and the whole purpose of doing research may get vitiated. The entire study should be divided into different chapters.

The present research work was organized into six chapters.

CHAPTER-I : Profile of Industries

The most crucial decision of any company is involved in formulation of its appropriate capital structure. The best design or structure of the capital of a company obviously helps the management to achieve its ultimate objectives of minimizing overall cost of capital, and also maximizing the value of the firm. It is thus apparent that the design of the capital structure of a company may have a bearing on the profitability of the company.

Capital structure decisions assume vital significance in the corporate financial management due to their influence both on return and risk of the shareholders. The close nexus between optimum use of debt and the market value of the firm is well recognized in literature. Whereas an excessive use of debt may endanger the very survival of the corporate firm, a conservative policy may deprive the corporate firm of its advantages in terms of magnifying the rate of return to its equity shareholders.

CHAPTER-II : Theoretical Aspects of Capital Structure & Review of Literature

Theoretical and empirical research suggests that financial planner should plan optimal capital structure. In practice, financial management literature does not provide specified methodology for designing a firm’s optimal capital structure.

A number of research studies have been conducted regarding the choice of debt equity mix in the total capitalization of a firm in the International as well as Indian context.

CHAPTER-III : Research Methodology

The research was aimed at studying the changes in the capital structure of selected industries in the state of Gujarat during the period 2005-06 to 2009-10. The study
includes five companies in each of the industries i.e. pharmaceutical and engineering which are spread all over Gujarat.

The research design includes geographical areas, population and sample, research tools, procedure of data collection, methods and tools of analysis.

The overall economic climate of the nations affects the capital structure of a company. Individual units always strive to grow year by year. Information would be required to study the internal financial policies and ultimate performance of the selected units in terms of various financial parameters. All the required data collected, would be studied in detail and conclusions will be drawn through scientific analysis and interpretation.

The data collected was analyzed in order to draw meaningful conclusions. Firstly, the analysis of the balance-sheet of individual units was undertaken and then the trend in the various variables like the cost of capital, earnings per share, debt-equity ratio over a period was analyzed.

For the purpose of study statistical techniques like Analysis of Variance (ANOVA), Trend analysis, F-test and t-test were applied.

**CHAPTER-IV : Analysis of Capital Structure of Selected Units**

The capital structure is how a firm finances its overall operations and growth by using different sources of funds. Debt comes in the form of bond issues or long-term notes payable, while equity is classified as common stock, preferred stock or retained earnings. Short-term debt such as working capital requirements is also considered to be part of the capital structure.

A company's proportion of short and long-term debt is considered when analyzing capital structure. When people refer to capital structure they are most likely referring to a firm's debt-to-equity ratio, which provides insight into how risky a company is. Usually a company more heavily financed by debt poses greater risk, as this firm is relatively highly levered.

In order to analyze the capital structure of the selected companies, solvency ratios i.e. Current Ratio, Debt Equity and Ratio Interest Covering Ratio are calculated.
The impact of the solvency ratios on the market value of the shares of the companies is studied.

**CHAPTER-V : Profitability Analysis of Selected Units**

Every firm is most concerned with its profitability. One of the most frequently used tools of financial ratio analysis is profitability ratios which are used to determine the company's bottom line. Profitability measures are important to company managers and owners alike. If a small business has outside investors who have put their own money into the company, the primary owner certainly has to show profitability to those equity investors.

Profitability ratios show a company’s overall efficiency and performance. We can divide profitability ratios into two types: margins and returns. Ratios that show margins represent the firm’s ability to translate sales dollars into profits at various stages of measurement. Ratios that show returns represent the firm’s ability to measure the overall efficiency of the firm in generating returns for its shareholders.

Margin ratios are the Gross Profit Margin, Net Profit Margin, Cash Flow Margin and the Operating Profit Margin.

Return ratios are the Return on Assets (also called Return on Investment), Return on Equity and Cash Return on Assets.

The impact of the solvency ratios on the performance of the companies is studied.

**CHAPTER-VI : Findings and Suggestions**

Certain findings and observations were made related to the capital structure from the data collected of the selected pharmaceutical and engineering units. In the study various capital structure ratios were calculated and the findings were concluded. The fluctuations in the debt-equity ratio, interest coverage ratio and the earnings per share were studied. The study also included the calculation of profitability ratios of the selected units. The changes in the gross profit margin, net profit margin, return on investment, and return on net worth were found out.

The overall observation pertaining to both the industries under study was that there is no stability or consistency in any of the ratios which may be owing to the drastic
changes in the economy. The constant volatility in the economy affects each and every sector and the same is observed in the study.

3.12 IMPLICATIONS OF THE STUDY

Every research undertaken is beneficial to someone or the other at some point of time. No research is without its implications.

The present research intended to make a critical study of units of different industries and thereby derived inferences. The conclusions drawn can be helpful in enriching the prevailing pool of knowledge. The study can be helpful to the researcher as well as many beneficiaries like students, faculties of management, researchers, decision-making authorities, etc. It can help to enhance the theoretical knowledge related to capital structure. It can also help in getting an overview of the pharmaceutical and engineering industry in Gujarat. One can use the study as a base and can conduct further research.

3.13 LIMITATIONS OF THE STUDY

Limitations are a part and parcel of each and every research. There are certain factors which are beyond the control of the researchers and thus there are always some limitations. The present study was no exception to the above rule. In spite of all the efforts made the following drawbacks were there in the study:

1. This study may not be an exhaustive one owing to some limitations which are beyond the researcher’s control.
2. The collection of secondary data may posses certain drawbacks.
3. There were limitations of time, since the study covered a period of only five years, which may affect the conclusions made. The conclusions made for the above time period may not hold true for other periods.
4. Statistical tools are applied for the analysis of the data. The tools suffer from certain limitations and thus the findings of the study might have been affected.
5. The study included only one aspect of capital structure and its effect on earnings per share. There are many more aspects which could not be touched upon.
6. The major limitations of time constraint and resources constraint are always present.

In spite of the limitations, a sincere effort has been made to derive useful conclusions in the present study.

3.14 FUTURE DIRECTION FOR THE STUDY

As seen above the study had its own limitations. There is a wide scope for further research in the direction of the study. Researchers can conduct research from various aspects and can give more fruitful results.

- The present study includes selected pharmaceutical and engineering units in the state of Gujarat alone. There is scope for conducting a similar study in other states as well.
- The present research is related to the pharmaceutical and engineering industry but there can be a similar study of other industries in Gujarat and other states as well.
- The study of capital structure in similar industries in different states can be undertaken.
- An inter-state comparison of industries on the basis of capital structure can be made.
- The effect of cost of capital on the capital structure of a company can be studied.
- There is scope for studying the effect of the capital market on the capital structure.
- A study can be conducted to test the various determinants that influence the capital structure of a company.
- Research can be conducted to make a comparative study of the capital structures of public and private enterprises.
- Capital structures of companies across the border can be studied.
REFERENCES:


