CHAPTER III

RESEARCH METHODLOGY

Research is an original contribution by the researcher to the existing literature for their advancement.In short it is a systematic way to find a solution to the research problem and formulate a proper conclusion.This chapter includes the sample size selected, conceptual framework, data and statistical techniques. The methodology adopted was given below;

3.1 Research Design

3.2 Sample Selection Criteria

3.3 Period of Study

3.4 Sources of Data

3.5 Variables selected for the study

3.6 Statistical Techniques

3.1. RESEARCH DESIGN

The process of structured and systematic approach to conduct a research study is known as Research Design.The research study examines the "Impact of Capital Structure and Dividend Policy on Firm value of select Pharmaceutical Companies in India".In 2020, the Pharmaceutical Industry is one of the top ten sector attracting FDI in India.Thus, Pharmaceutical Industry in India was taken as a sample.From that there are company wise differences, due to different firm characteristics. Therefore there was the need to further classify the companies into different categories.The sample is classified on the following basis of Average Market Capitalization namely,Large capital comapnies ,Mid capital companies and Small capital companies.The Multistage sampling is used to select the companies under each category.The research study is descriptive and analytical in nature.

3.2 SAMPLE SELECTION CRITERIA:

The Sample selection is based on the criteria:

i) The Companies should be listed in BSE during the study period.

ii) Average Market Capitalization Jan-Jun 2021 Base.

ii) The companies should have declared dividend continuously for fifteen years (2007-2008 to 2021-2022).

Accordingly, the Pharmaceutical Companies from each category were selected based on the average market capitalization as per the Association of Mutual Funds in India report (January to June 2021) and the data availability. Totally thirty one companies were selected for the study. A list of companies selected for the study is given below:

Table 1

Classification of select Pharmaceutical Companies based on Average Market Capitalization

Category	Average Market Capitalization	No of Companies
Large Cap Companies	Rs:10,000 Crores & Above	7
Mid Cap Companies	Rs: 2 Crores & Above	6
Small Cap Companies	Below Rs:2 Crores	18
	Total	**31**

Table 2

List of select Pharmaceutical Companies – Average Market Capitalization (AMC) - 2021 Base [Amount in Rupees – Crores]

Large Capital Companies	Medium Capital Companies	Small Capital Companies
Sun Pharma (152282.42)	Alkem Labs (34870.71)	Aarti Drugs (6642.17)
Divi's Labs (101449.92)	IPCA Laboratories Ltd (25652.33)	Orchid Pharma (4694.86)
Dr.Reddy labs (82298.7)	Glaxosmithkline (25107.97)	IOL Chemicals & Pharmaceuticals (3764.27)
Cipla (70154.3)	Ajanta Pharma (15948.41)	Amrutanjan (1825.37)
Aurobindo (54994.18)	Nacto Pharma (15,477.74)	Novartis India (1628.26)
Lupin (49664.24)	Glenmark (15251.96)	Bliss GVS (1431.75)
Torrent Pharma (44869.64)	-	SMS Pharma (1200.21)
		Anuh Pharma (630.94)
		Linclon Pharma (517.31)
		Kappac Pharma (268.14)
		Jenburkt Pharma (203.8)
		Brooks Labs (185.6)
		Kilitch Drugs (177.55)
		Coral Labs (134.59)
		Bal Pharma (108.12)
		Alpa Labs (Rs: 98.76)
		Gennex Labs (70.32)
		Alembic Pharma (68.53)

Source: Computed Data- AMFI 2021 (January- June 2021 Base)

3.3 PERIOD OF STUDY

The study covers a period of fifteen financial years from (2007-2021).The study is analytical and quantitative in nature.

3.4 SOURCES OF DATA

The Pharmaceutical companies in India are taken as sample for the study. It is classified into Large Capital Companies, Mid Capital Companies and Small Capital Companies. This classification is based on the average market capitalization of companies. This industry is one of the top sectors in the FDI inflows of the country.The secondary data is collected from Annual Reports, Money control website,Capital line Database,AMFI Website and the IBEF reports.The necessary information for the research study was also collected from various websites, magazines, books etc.

3.5 VARIABLES SELECTED FOR THE STUDY

The selected Independent and Dependent Variables are given below:

1.To analyze the factors determining Capital Structure and Dividend Policy – Descriptive Statistics

Capital Structure Variables: Interest Coverage Ratio, Growth, Current Ratio, Debt Tax Shield,Return on Equity and Return on Asset.

Dividend Policy Variables: Quick Ratio, Earnings Per Share, Return on Asset, Return on Equity and Price-to book ratio and Price Earning Ratio.

2. To examine the impact of Capital Structure on Firm Value – Multiple Regression Analysis

Independent Variables: Debt Equity Ratio, Total Debt Ratio, Long Term Debt Ratio and Short Term Debt Ratio

Dependent Variable: Firm Value.

3. To assess the impact of Dividend policy on Firm Value.- Multiple Regression Analysis

Independent Variable: Dividend Payout Ratio and Dividend Yield Ratio

Dependent Variable: Firm Value.

4. To determine the impact of capital structure on Dividend Policy – Correlation Analysis and Panel Data Regression Analysis

Independent Variable: Debt Equity Ratio**,** Total Debt Ratio, Long Term Debt Ratio and Short Term Debt Ratio.

Dependent Variable: Dividend Payout Ratio and Dividend Yield Ratio.

5. To identify the relationship between Capital Structure, Dividend Policy and Firm Value – Correlation Analysis and Multiple Regression Analysis.

Independent Variable: Debt Equity Ratio**,** Total Debt Ratio, Long Term Debt Ratio, Short Term Debt Ratio, Dividend Payout Ratio and Dividend Yield Ratio.

Dependent Variable: Firm Value.

6. To find out the Intra industry differences of Pharmaceutical Companies in Capital Structure and Dividend Policy – Compound Annual Growth Rate (CAGR) and Trend Analysis.

Capital Structure and Dividend Policy Variables: Debt Equity Ratio**,** Total Debt Ratio, Long Term Debt Ratio, Short Term Debt Ratio, Dividend Payout Ratio and Dividend Yield Ratio.

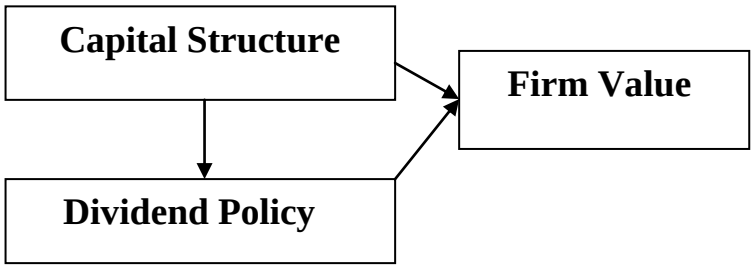
Table 3

Variables Description

Variables	Measures
Debt Equity Ratio	Total Debt/Total Equity
Total Debt Ratio	Total Debt/Total Asset
Long Term Debt Ratio	Long Term Debt/Shareholders Equity
Short Term Debt Ratio	Short Term Debt/Shareholders Equity
Dividend Payout Ratio	Dividend Per Share/Earnings Per Share
Dividend Yield Ratio	Dividend Per Share/Market Value per share
Price Earnings Ratio	Market value Per Share/Earnings Per Share
Price to Book Ratio	Market Price Per Share/Book Value Per Share
Firm Value	Market Value of Equity Shares (S)+ Market Value of Debt(D)
Growth	Change in sales/Prior period sales
Interest coverage ratio	Earnings before interest and tax/Fixed Interest charges
Return on Asset	Net Profit After Tax/Average Total Asset
Return on Equity	Profit after tax/Net Worth
Debt Tax Shield	Net Interest Expense * Tax Rate
Earnings Per Share	Profit after tax / Number of shares
Quick ratio	Liquid Asset/Current Liabilities
Current Ratio	Current Asset/Current Liabilities

Source: (Financial Management- Pandey,Sharma Gupta and Khan & Jain)

CONCEPTUAL FRAMEWORK OF THE STUDY



Based on the capital structure and dividend policy theories many empirical studies have been carried by the previous researchers (Divya Aggarwal,2017; Paminto,A., et al.2016; Khan et al.2021;Thi Ngoc Bui & Thi Ngoc Bui,2023).But, this conceptual framework has been developed with new constructs/relationship between the variables.There are few research studies which had developed the capital structure model

that studies Firm value,Profitability,Corporate governance,Financial Performance etc.This research study incorporates the combined effect of capital structure and dividend policy on firm value and the impact of capital structure on dividend policy of select pharmaceutical companies in India.Most of the reviewed studies included Debt Equity Ratio to measure the capital structure and Dividend Yield Ratio to measure the dividend policy (Padhan,P.C,2017; Pham et al.2020;Subha Ranjan Dutta et al.2022).The present research study have concentrated on four category of variables for capital structure (Debt Equity,Total Debt Ratio,Long Term Debt Ratio and Short Term Debt Ratio),the two category of variables to assess the dividend policy (Dividend Payout Ratio and Dividend Yield Ratio) and to measure the firm value (Market value of a firm) has been adopted.

3.6 STATISTICAL TECHNIQUES

Data analysis is the application of statistical tools for illustrating, condensing and evaluating the data.The various statistical tools like SPSS and E Views were applied.During the research, financial ratios and statistical analysis were used to interpret the results.The variables used for the study are explained below:

3.6.1Financial Ratios

The financial ratios were utilized to compare any company financial analysis with other organization.In financial analysis, "a ratio is used as a benchmark for evaluating the financial position" (I.M.Pandey,2008). It was also useful for investors to analyse the financial history and to check whether it good to invest in that business.The financial ratio which takes into account the company's profit,liquidity,leverage and market value which shows the economic situation for the purpose of statistical results.For certain problems,the ratio act as an indicator,caution,sign or hint.

1. Ratio Analysis

The Ratio analysis is an essential method for measuring the financial stability.It is described as "the relationship between two mathematical expressions and their indicated quotient and an association between two or more things".It is a major part in analysis which includes every financial statements.It will be useful to measure the liquidity,solvency,profitabiltiy and operating efficiency.In order to get the information regarding the company performance, many analyst depend much on the past and present

financial statements.It is also used to determine whether the financial efficiency of the company is improving or deteriorating using the information collected from this analysis.

a) Debt Equity Ratio: This ratio refers to the association between the lenders contribution and the owner's contribution in terms of rupees.It is the more often used indicator of financial leverage.If a company has a debt ratio higher than the average for the sector it will be considered as risky.Many financial institutions for making decision regarding debt funds they should also consider the debt ratio.

Debt Equity Ratio = Total Debt/Total Equity

b) Total Debt Ratio: This ratio is used to evaluate and to figure out how much of assets for the business acquired by debt.It enables the investors to understand the risk of investing in that business which uses high debt funds to generate maximum profits.It is a debt ratio which determines the overall amount of debt with quantity of total assets.Moreover, it helps the organization to use the debt effectively to enhance and develop its financial activities.

Total Debt Ratio = Total Debt / Total Asset

c) Long Term Debt Ratio: This ratio is a metric which helps to evaluate how much of assets were acquired for the business through debt capital.It is used to manage the assets of the organization.The manager can easily assess the capacity of the organization to meet its long term debts.It will also helps the investors to take better decision before investing the company which uses high long term debt to rise their capital

Long Term Debt Ratio= Long Term Debt / Shareholders Equity

d) Short Term Debt Ratio: This ratio is regarding the short term debt which is to paid within one year.It is also called Current liabilities.During the regular corporate operations, the operating debt will be accumalated.The Accounts Payable and the amount which the company spends for its suppliers or the service providers is a short term debt, since it is typically assumed to be repaid in the very near future.

Short Term Debt Ratio =Short Term Debt/Shareholders Equity

e) Dividend Payout Ratio: The term "dividend" refers to a payment made to shareholders in exchange for their investment. The third important financial choice is a dividend decision. The firm's finance manager must determine whether to disperse all profits, keep some of them, or distribute some but retain the rest.It is the percentage of profits allocated as dividends.The finance management of the company must decide whether to distribute all profits, retain some of them, or to distribute some profits.

Dividend Payout Ratio = Dividend per share/Earning Per share

f) Dividend Yield Ratio: This ratio refers to the dividend which is paid each year in relation to its share price.As per the business financial life cycle, the yield may be high or low.It is most suitable for the expanding business operations to minimize the payment of dividends.These companies can use the funds to new projects or for the business expansion.

Dividend Yield Ratio = Dividend Per share/Market Value Per share

g) Price Earnings Ratio: The ratio is an important indicator of a company's risk and return. It helps investors decide whether or not to buy a company's stock at a certain price. Security analysts frequently use the price-earnings ratio to assess the company's performance relative to expectations of investors. It reveals the opinion or expectations of investors regarding the firm's performance. The management is likewise curious about the market value of the firm's performance and would like to know why the Price Earning ratio is declining. Investors expectations for the growth in the company's earnings are reflected in the PE ratio.

Price Earning Ratio = Market value per share/Earning Per Share.

h) Price to book ratio: This ratio helps the investors to decide whether to invest in the company or not.They use this ratio to measure whether a company’s stock price is valued properly.It shows the association within the market price of share and book value per share.The companies with low PB ratio consistently had a huge returns compared with high PB ratios.It also helps to predict the future stock returns.

Price to book ratio = Market price per share/Book value per share

i) Firm Value: This ratio says about the value of the company and in theory it is referred as a control over a commercial company.Similar to an asset, a company's value can be assessed using either book value or market value.Yet typically it relates to a company's market value.

Firm Value = Market Value of Equity Shares (S) + Market Value of Debt (D)

j) Growth: The companies with new products, capacity for expansion,acquisition of other companies and replacement of assets have high growth potential.The debt capital in the capital structure will be reduced with substantial growth companies.It is measured as Change in Sales to Prior period sales.

Growth = Change in Sales / Prior period sales

k) Interest Coverage ratio: This ratio is used to ascertain the financial capacity of any business organization.It is also useful for the organization to manage the debts ascertained through ICR.The high Interest Coverage Ratio indicates the better position of the company.The interest should be paid correctly to the creditors.It shows that how much times a company should pay the debts through its earnings.It is derived by Earnings before interest and taxes (EBIT) to total interest expense on all of the company's outstanding obligations.. A company's debt may consist of loans, bonds, and credit line.

Interest Coverage ratio = Earnings before interest and tax/Fixed Interest Charges

l) Return on Asset: This ratio compares a company's profitability to its total assets and it is a sort of Return on Investment (ROI).It also helps to measure the financial performance.ROA is useful for the investors, management and analyst to analyze the financial efficiency of the organization.By using this measure the business fuctions can be known like how the management is performing and this ratio can be ascertained by comparing a company's earnings to the capital it has invested in assets.When the management uses the available resources properly it will help them to increase their returns.

Return on Asset = Net profit after tax/ Average total asset

m) Return on Equity: This ratio measures how effectively a company utilizes the equity capital.It is determined by net profit after tax to shareholder's equity.The goal of an organization is to provide a satisfying payback.The success of this purpose is indicated by the net profit to owner's equity ratio.The management whose work is to maximise the welfare of the owner is also quite concerned which is of significant importance to both current and potential shareholders.

Return on Equity = Profit after tax/Net worth or Shareholders Equity

n) Debt Tax Shield: This ratio means that the value of tax shield depends on the tax rate of the business organization.It is allowable deduction from tax, which results in a reduction of taxes owed. Referred to as tax allocation, this is done by first calculating the tax benefit of deducting net interest expense on debt for tax purpose and allocating it to operating income.The tax benefit sometimes referred as the tax shield from debt is measured as,

Debt Tax Shield = Net Interest Expense * Tax Rate

o) Earnings Per Share: The term "Earning Per Share" is regularly used indicator to assess the company value. The results of EPS computations demonstrate whether the company's profit on a per-share basis has changed during that time. It is important to compare the company's EPS to both the industry average and the EPS of competing companies.It ascertain only the profitability on the share basis but it does not account for the amount paid out as dividends or the amount retained in the company.However, it is useful and frequently employed ratio as a measure of profitability.

Earnings Per Share = Profit after tax/Number of shares

p) Quick Ratio: This ratio helps the companies to measure their ability to pay off their short term debt within a short period of time.It also portrays about how the firms can increase its quick assets to repay the debts to their creditors.Debtors and bills receivable, as well as marketable securities, are additional assets that are seen as being relatively liquid.The ability to pay off debts and stay current on payments is easier.Before making quick loans to the company, the creditors must first evaluate this crucial factor.

Quick Ratio = Liquid Asset/Current Liabilities

q) Current Ratio: The short-term solvency of the company is determined by the current ratio. A ratio larger than one indicates that the company has more short-term assets than short-term liabilities. For creditors, the current ratio serves as a safety margin.The margin of safety increases with the current ratio, and the firm's capacity to satisfy short-term obligations rises with the ratio of current assets to liabilities.

Current Ratio = Current Asset/Current Liabilities

3.6.2 Statistical tools used for the study

To analyze the influence of Capital Structure and Dividend Policy on Firm value the data analysis were carried out.The statistical tools were applied with SPSS 16 Software Package and EViews12 to derive the Proper results and conclusion. The tools used to analyze the data were listed below:

1.Descriptive Statistics

To depict the properties of the data, descriptive statistics were employed. They generate a concise summary of the samples and metrics. In a set of data, the mean is the average or most common value.It also ascertain the centeral tendency with median and mode. The distance between data points and the distribution is referred to as variability.Range is the variation between the high and low values. The expected squared variation from the mean of a random variable is its variance.Standard Deviation is a measure of variation in a grouped data of statistics.The standard deviation is a measure of the amount of variation or dispersion of a group of data in statistics. It is defined as the square root of variance. Arithmetic mean is most commonly used method to compute average. It can be determined as sum of numbers divided by number of number of terms.

$$\overline{X} = \frac{\sum x}{n}$$

The standard deviation is determined as the square root of variance by calculating the deviation of every statistic from the mean. If the number of observations exceeds the mean, the data gathering is more volatile. As a result, when the standard deviation is larger, the data will be skewed. The following is the standard deviation formula.

$$\sigma = \sqrt{\frac{\sum (\overline{x} - x)^2}{n-1}}$$

In the study the Mean and Standard deviation is calculated for the select variables to analyze the descriptive statistics of Capital Structure, Dividend Policy and Firm Value of select Pharmaceutical Companies in India.

2. Correlation Analysis

The most popular technique for assessing the relationship between two variables is to apply Karl Pearson's coefficient of correlation (also known as simple correlation). There is no correlation between the two variables if the value of 'r' is 0. Variations in the independent variable (X) account for 100% of the variations in the dependent variable (Y) when r = (+) 1 and (-) 1, respectively, show perfect positive and perfect negative correlation. Additionally, if there is a constant change in the dependent variable in the same direction for a unit in the independent variable, the correlation is said to be perfect positive.

But if a change is done in the opposite direction, it will be named as perfect negative.The value of ‘r’ which is closer to +1 or -1, it means a higher correlation between any two variables.The Karl Pearson Correlation can be calculated using this formula.

$$r = \frac{n(\sum xy) - (\sum x)(\sum y)}{\sqrt{[n\sum x^2 - (\sum x)^2][n\sum y^2 - (\sum y)^2}}$$

The Correlation analysis has been applied to assess the connection between the select dependent and independent variables of select Pharmaceutical Companies in India.

3. Multiple Regression

The phrase "Multiple Regression" refers to the process of predicting the result of a dependent variable using two or more independent variables. This method allows analysts to determine the variation of the model and the proportional contributions of each independent variable to the overall variance. The regression formula is

$$Y = \alpha + ßX + e$$

Y = Dependent Variable,

α = Constant,

X = Independent Variable,

ß = Coefficient of explanatory variable

e = Error Term.

The Multiple Regression analysis has been applied to assess the impact of the select dependent and independent variables of select Pharmaceutical Companies in India.

4. Compound Annual Growth Rate

CAGR is applied to determine the increasing or decreasing rate of Capital Structure category wise of selected Pharmaceutical Companies. The compound annual growth rate (CAGR) is the rate at which your investments rise year after year over a set period of time. In other words, it's a measure of how much money you've made on your investments each year over a set period of time. This is one of the most accurate ways to figure out how much your investment returns have increased or decreased over time. It is an effective means of determining the variation in capital structure over time for a group of Indian pharmaceutical companies. The CAGR formula is

CAGR = (End Period Value/Beginning Period value)^ (1/n) - 1

The compound annual growth rate provides the average growth rate value for a particular time period for select Independent and Dependent Variables of select Pharmaceutical Companies in India.

5. Trend Analysis

The Trend Analysis approach uses trend data that has recently been seen to estimate future changes in stock price. The long-term direction of market may be predicted using trend analysis, which uses historical data like price changes and transaction volume.Data uses earlier data, such as price variations and transaction volume, to do trend analyses. Data must be acquired from various time periods and put on a horizontal line for a future research to perform a trend analysis. This study's objective is to identify trends in the given data.

Trend Percentage = Current year amount / Base year amount * 100

In this research study, trend analysis is used for Capital Structure and Dividend Policy and Firm Value,which would help in providing valuable evidence for appropriate decision making for the selected Industries year-wise of the select Pharmaceutical Companies in India.

6. Panel Data Regression Model

In social sciences and econometrics, panel data analysis is a statistical approach for analysing data collected over several time periods and for the same people or institutions. A simple panel data regression can specified as:

$$\mathbf{Y_{it} = \alpha + \beta x_{it} + e_{it}}$$

Y = Dependent variable

X = Independent variable

α = Constant term

β = Coefficient to the regression model

i and t indices for individuals and time

e - Error term

There are three main ways to perform a panel data regression analysis: (a) Independently Pooled OLS regression model. (b) Fixed effects model (c) Random effects model

a) Independently Pooled OLS regression model: This model implies that all data sections in a panel data research are homogeneous, implying that they will all be treated identically. All portions can also be considered as a single data segment. In a nutshell, the measurement set has no unique personal features and no long-term universal consequences.

b) Fixed effects model: This model allows for cross-section heterogeneity or distinctness, with each having its unique intercept. As a result, the cross section intercepts may vary, but they are time invariant, implying that they won't change with time. In a fixed effects model, the error term is supposed to evolve non-stochastic across time and among entities. Individuals have unique features that are based on external factors and do not change over time. The parameters are fixed, the group means are fixed in this model. Dummy variables can be used to estimate the fixed effect model.

c) Random effects model: In the random effect model, which allows for variability and is time invariant, individual particular effects are tied to independent components. It's also a hierarchical linear model in which data is gathered from a hierarchy of distinct populations, with differences in the hierarchy.The Panel Data Regression is applied in this research study to identify the impact of Capital Structure on Dividend Policy of select Pharmaceutical Companies in India.