COST OF CAPITAL & CAPITAL STRUCTURE – A STUDY OF SELECTED INDIAN COMPANIES

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by

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(2K16/PHD/DSM/07)

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CANDIDATE'S DECLARATION

I Anali Sisodia, hereby certify that the work which is being presented in the thesis titled **"Cost of Capital & Capital Structure – A Study of Selected Indian Companies"** in fulfillment of the requirements for the award of the Degree of Doctor of Philosophy, submitted in the Department of **Delhi School of Management**, Delhi Technological University is an authentic record of my own work carried under the supervision of **Prof. Dr. G. C. Maheshwari and Dr. Deepali Malhotra.**

The matter presented in the thesis has not been submitted by me for the award of any other degree of this or any other Institute.

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Certified that **Anjali Sisodia (**2K16/PHD/DSM/07) has carried out her research work presented in this thesis entitled **"Cost of Capital & Capital Structure – A Study of Selected Indian Companies"** for the award of Doctor of Philosophy from Delhi School of Management, Delhi Technological University, Delhi, under our supervision. The thesis embodies the results of original work, and studies are carried out by the student and the contents of the thesis do not form the basis for the award of any other degree to the candidate or to anybody else from this or any other University/Institution.

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Executive Summary

The relationship between capital structure and cost of capital is a fundamental aspect of corporate finance. It involves understanding how the mix of debt and equity financing affects a company's overall cost of capital, which in turn influences its valuation and financial strategy. This study investigates the relationship between capital structure and cost of capital for selected companies listed on the NIFTY 50 index over the period 2010-2024. The analysis focuses on various determinants of capital structure and their impact on the overall cost of capital, substantiated through prominent capital structure theories such as the Trade-Off Theory, Pecking Order Theory, and Agency Theory.

The study examines the determinants of capital structure by identifying key variables influencing the capital structure of NIFTY companies. The secondary data from financial statements of NIFTY 50 companies, spanning 2010-2024 has been investigated and dependent variables like debt-equity ratio and independent variables: tangibility, taxability, liquidity, profitability and WACC were analysed. The regression analysis to explore the impact of independent variables on the capital structure and cost of capital is implemented.

Literature indicates that debt financing offers tax benefits since interest payments are tax-deductible. This deduction reduces the company's taxable income and, consequently, its tax liability, effectively lowering the cost of debt. However, excessive reliance on debt increases financial risk, particularly during economic downturns or periods of cash flow issues. As a result, lenders may demand higher interest rates to compensate for the increased risk, thus raising the cost of debt. Generally, the cost of debt is lower than the cost of equity due to the tax shield. Yet, as debt levels rise, the marginal cost of additional debt increases because of the heightened risk of financial distress.

In contrast, equity financing does not provide tax benefits, making it more expensive than debt. Investors require a higher return on equity to compensate for the greater risk

compared to debt. However, equity financing offers greater financial flexibility and reduces the risk of financial distress. Companies with higher equity levels are better positioned to withstand economic downturns and have more flexibility in their financial strategies. One potential drawback of issuing new equity is the dilution of existing shareholders' ownership, which may concern current shareholders and management.

The study found that moderate levels of debt can reduce the overall cost of capital due to tax benefits. However, high levels of debt increase financial risk and the cost of capital. Companies with higher equity levels tend to have a higher cost of capital due to the higher required return on equity. However, these companies also benefit from greater financial stability and flexibility. The optimal capital structure for NIFTY companies appears to be a balanced mix of debt and equity, where the cost of capital is minimized, and financial flexibility is maintained.

The relationship between capital structure and cost of capital is complex and influenced by various factors, including tax benefits, financial risk, and investor expectations. The findings from the study of NIFTY companies suggest that a balanced approach to capital structure, leveraging both debt and equity, can help minimize the overall cost of capital while maintaining financial stability. The study concludes that the capital structure of NIFTY companies is influenced by multiple factors, including tangibility, taxability, liquidity, profitability and WACC. These determinants play a crucial role in shaping the cost of capital. The findings align with prominent capital structure theories, providing a comprehensive understanding of the dynamics between capital structure and cost of capital for Indian companies.

This study provides valuable insights into how companies can optimize their capital structure to minimize the cost of capital. Corporate Managers can use the findings to make strategic decisions about financing, balancing debt and equity to minimize the cost of capital and enhance shareholder value. It is important for strategic financial planning, helping companies make informed decisions about financing options. The companies by understanding the optimal mix of debt and equity, can achieve financial stability, reducing the risk of financial distress and contributing to overall economic

stability. Policymakers can use the findings to develop regulations that encourage optimal capital structures, promoting sustainable economic growth fostering a stable and efficient financial market. The insights help investors and financial analysts assess the financial health and risk profile of companies, leading to more informed investment decisions and portfolio management. The research provides a foundation for further studies on capital structure, encouraging exploration of new variables and models in different economic environments.

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LIST OF ABBREVIATIONS

ANOVA	:	Analysis of Variance
AT	:	Agency Theory
AUTO	:	Automobile
BFSI	:	Banking, Financial Services, and Insurance
BPCL	:	Bharat Petroleum Corporation Limited
CAGR	:	Compounded Annual Growth Rate
CAPM	:	Capital Asset Pricing Model
CMIE	:	Centre for Monitoring Indian Economy
DCF	:	Discounted Cash Flow
DR	:	Debt Ratio
DW	:	Durbin-Watson
EBIT	:	Earnings before interest and tax
FDI	:	Foreign Direct Investment
FinTech	:	Financial Technology
FMCG	:	Fast Moving Consumer Goods
GDP	:	Gross Domestic Product
HCL	:	Hindustan Computers Limited
HPCL	:	Hindustan Petroleum Corporation Limited
IBEF	:	India Brand Equity Foundation
IOCL	:	Indian Oil Corporation Limited
IT	:	Information Technology
(KS) test	:	Kolmogorov Smirnov
Liq.	:	Liquidity
M.M.	:	Modigliani Miller
N.I.	:	Net Income
N.O.I.	:	Net Operating Income
NDTS	:	Non- debt tax shield
NIFTY	:	National Stock Exchange Fifty and it represents the top 50 Indian company stocks traded on the NSE.

NSE	:	National Stock Exchange
NTPC	:	National Thermal Power Corporation Limited
ONGC	:	Oil & Natural Gas Corporation Limited
PHARMA	:	Pharmaceutical
POT	:	Pecking Order Theory
Prof	:	Profitability
PSU (Banks)	:	Public Sector Undertakings (Banks)
REALTY	:	Real Estate
SIG	:	Significance
SMEs	:	Small and medium-sized enterprises
Tang	:	Tangibility
Tax.	:	Taxability
TCS	:	Tata Consultancy Services Limited
TOT	:	Trade-Off Theory
USD	:	United States dollar
V.I.F.	:	Variance Inflation Factor
WACC	:	Weighted Average Cost of Capital

CHAPTER 1

INTRODUCTION

1.1. Introduction to the topic

The relationship between capital structure and cost of capital is a principle topic in corporate finance, influencing a firm's financial strategy and overall value. Capital structure refers to the mix of debt and equity that a company uses to finance its operations and growth. The cost of capital, on the other hand, represents the return that investors expect for providing capital to the company. This metric is often used to shape or adjust the company's capital structure. When planning capital budgets, management must consider the weighted average cost of capital. It also plays a role in decisions about dividends and working capital and helps evaluate the soundness of the company's financial policies. Understanding this relationship is crucial for optimizing financial performance and ensuring long-term sustainability.

A firm gathers funds from various sources to invest in profitable ventures. These long-term sources form the company's capital structure, which includes equity shares, preference shares, debentures and long-term loans. Each source has its own cost, so the firm must earn a return on investment that meets or exceeds these costs. The cost of capital, expressed as a percentage, helps decide whether to accept or reject investment proposals and varies with changes in the capital structure.

Calculating the cost of capital can be complex, especially when evaluating different capital expenditure options. Borrowing money limits future borrowing capacity and affects future capital costs. Long-term considerations are crucial in determining the cost of capital. The cost of debt includes interest, adjusted for tax and flotation costs. Generally, debt is cheaper because it offers security to investors, resulting in lower returns. Interest on debt is tax-deductible, reducing the effective cost of debt. However,

flotation costs increase the overall cost of raised funds. The cost of preference share capital is based on the fixed dividend rate, which is not tax-deductible, making it generally more expensive than debt. The cost of equity capital is determined by expected dividends or earnings. Retained earnings, part of the equity base, are considered to have the same cost as equity capital since they belong to shareholders and could have been distributed to them.

A company sources funds from various channels, each with different costs. To accurately reflect the total cost of capital, these costs must be weighted according to their proportion in the capital structure, using either book or market values. Forming the capital structure is a managerial decision that must balance the interests of shareholders with the company's cost of capital, effectively trading off between risk and return.

Understanding the determinants of capital structure and its impact on the cost of capital is crucial for several reasons:

i. **Financial Performance**: The choice of capital structure affects a firm's financial performance and risk profile. An optimal capital structure can minimize the cost of capital, thereby enhancing firm value and shareholder wealth.
ii. **Investment Decisions**: Firms need to finance their investment projects efficiently. The cost of capital serves as a benchmark for evaluating the profitability of these projects.
iii. **Market Perception**: Investors and analysts closely monitor a firm's capital structure as it provides insights into its financial health and management's strategic decisions.

Focus of Study

The current research on NIFTY companies is particularly relevant given the unique characteristics of these sectors:

i. **Indian Utilities**: The utility sector in India is capital-intensive, requiring substantial investments in infrastructure and technology. These firms often rely

on a mix of debt and equity to finance their operations. The regulatory environment, government policies, and the need for sustainable energy solutions further influence their capital structure decisions.

ii. **NIFTY Companies**: The NIFTY 50 index comprises the top 50 companies listed on the National Stock Exchange of India, representing various sectors. These companies are typically large, well-established firms with diverse financing needs. Studying their capital structure provides insights into the broader trends and determinants influencing corporate finance decisions in India.

1.2. Background

The concept of capital structure has been extensively studied since the seminal work of Modigliani and Miller in the 1950s. Their propositions laid the foundation for modern theories, suggesting that under certain conditions, the value of a firm is unaffected by its capital structure. However, real-world complexities such as taxes, bankruptcy costs, and asymmetric information necessitate a deeper exploration of how capital structure decisions impact the cost of capital.

The capital structure decision is considered as the most significant decision for the firm as it directly impacts the firms finances and subsequently other related variables. The firms which are overleveraged does not considers debt for firm's future capital requirements rather prefers equity over it. Since the cost of equity is higher than cost of debt and it implies that overleverage firms finance their investments requirements at higher cost of capital and face external financing difficulties (Lee,et al.,1996). The overleveraged firms not only restrict the external financing for itself rather creates internal financing constraints too as it demands timely payment of fixed interest expense by the managers which restricts the corporate funds available at managers disposal (Jensen,1986). Likewise, is the case with underleveraged firms which are unable to attract external debt capital. The underleverage is the condition where the firm is running below the optimum leverage ratio. The extreme and persistent underleveraging represents poor management i.e. inefficient capital structure policy

and directs towards inferior growth opportunities which might result into future constraints in firms financing (Boapeah, H, A et al.,2018).

This clearly shows that firms cannot afford to be overleveraged or underleveraged as it obstructs their future financing choice. There should be an appropriate capital structure which is extremely necessary for the firm's survival, and this could be possible by understanding the cost of capital and capital structure relation and identifying the determinants affecting the capital structure of the firm. The importance of studying the relationship between capital structure and cost of capital lies in its practical implications for corporate decision-making. An optimal capital structure minimizes the cost of capital, thereby maximizing firm value. This balance is essential for achieving cost efficiency, managing financial risk, and enhancing investor confidence. Moreover, understanding this relationship helps firms navigate regulatory requirements and adapt to changing market conditions. This study aims to examine the above-mentioned important concepts named cost of capital and capital structure and investigates the impact of determinants on the capital structure of the firms with reference to selected Indian companies from different sectors under NIFTY.

1.3. Rationale of the study

Capital structure decision is the most significant feature of the firm success. Firms are found to become bankrupt due to their inadequate capital structure. It is needed to have a well-designed capital structure for an emerging economy like India to determine the cost of capital which eventually maximises the value of the firm (Chadha and Sharma, 2015). It is highly demanded to determine the factors which are responsible for achieving optimal capital structure. Attempt should be made to understand comprehensively the various factors both controllable and non-controllable and their influence on leverage levels of Indian firms. The characteristic of equity holders is as of the owner of the firm having long term commitment concerned with growth of the firm on the cost of taking risk while the debt holders are concerned with timely payment of interest and principal as they do not hold any ownership in the firm and no obligation of long-term commitment. Firms want to maintain the certain level of retained earnings for financing their future cash requirements while equity holders are

more interested in regular payment of dividend. Hence the decision of the firm towards capital structure plays a very vital role on the financial structure of the firm.

The study is undertaken to understand the impact of factors which influence the capital structure of the firms. It gave us the knowledge about some distinctive factors prevailing which vary drastically ranging from firm level to country level. Firm level factors like tangibility, growth, size of the firm, its profitability, liquidity play a significant role in determining the capital structure of the firm and the factors which vary from country to country like GDP growth rate, inflation rate, bond market development and protection of creditors right play a major role in determining the corporate capital structure. Firms are intended to take less debt when performing under the suitable legal environment and having appropriate economic conditions (Jong et al.,2007). It is discovered that the variables that are considered to stimulate the debt ratio and the capital structure composition in USA and European countries also have their significance in developing countries. The leverage ratio shares the inverse relationship with the profitability of the firm in both developed and developing country dynamics. Tax rate does not seem to influence much of the financing decision but there are certain factors classified under country level which influence the financing decision like GDP growth rate and inflation rate (Booth et al.,2001).

The factors which influence the leverage content in USA appear to significantly influence in other G7 (Canada, France, Germany, Italy, Japan, U. K, and USA) countries. The leverage ratio is found to be very less in U.K and Germany comparatively to other G7 countries and rest of them maintain almost the same level of leverage. Several institutional differences like bankruptcy laws, prevailing tax code, ownership structure in US seems to have similar relation in other countries as well regarding the debt ratio. However, it is suggested that the more knowledge and understanding of the institutional factors may depict the better picture to help identify the determinants of capital structure (Rajan and Zingales, 1995). Thus, on thoroughly reviewing the past research in this direction this study develops a bases to introspect the relation of cost of capital and capital structure.

1.4. Research Gap

The Capital Structure study has been the most prevalent topic for discussion after the (Modigliani and Miller,1958) classic research on capital structure. MM theorem in this regard states that the cost of capital is independent of the firm's capital structure. It reveals that there is no material impact on the cost of capital or value of the firm from the financing choice made between debt and equity. Robichek and Myers (1966) says that in the absence of taxes, the value of the firm will not change for moderate amounts of leverage but will decline with high degrees of leverage, and in the presence of taxes, an optimal degree of leverage will exist. The study argues for an optimal degree of financial leverage and is justified without assuming market to be imperfect which are alleged to prevent the arbitrage process described by Modigliani and Miller.

The capital structure theorem formulated states that the firm's cost of capital is constant along the range of inefficient capital structure and increases under efficient range. It has been notified that in a perfect capital market having constant interest rate any capital structure is an efficient capital structure with constant cost of capital but with the increase in firm's borrowing rate and in the presence of constant investors rate the range of efficient capital structure confines (Ben Shahar, 1968).

In the study conducted (Ben Shahar,1968), a model is worked considering a perfect capital market where the interest rate is held constant and, in the condition, where there is no tax, the investors show indifferent approach towards the firms leverage rate and prefers all stocks as perfect substitutes falling under specific risk class. Thus, considering these assumptions the market value of the firm and its cost of capital are independent of its capital structure. The comparative study of the effects of capital structure on the cost of capital is being evaluated in the study undertaken by (Rao and Litzenberger,1971) in a less developed and highly developed capital market. The results convey the consistency with (MM,1958) approach in the American utilities representing that after allowing for the tax advantage of debt financing the cost of capital is independent of capital structure. The results in case of Indian utilities were inconsistent with the MM independence hypothesis and reveals that moderate debt content in capital structure will lower the firm's cost of capital. Thus, it has been

postulated that the basic proposition of the firm's financing is the capital structure theorem which makes the relationship between the firm's capital structure and its cost of capital.

There is no free lunch in raising a capital either from debt or equity. There is a significantly direct relationship of capital structure and cost of capital. It has been observed that by increasing debt in the capital structure reduces the cost of capital and resulting into the risk for shareholders eventually demanding higher returns for their share which increases the cost of capital. Thus, the entire phenomenon of capital structure depends on the relationship between these two effects (Ward, 1999). Empirical assessment of 55 proposed determinants of capital structure for their statistical and economic significance was conducted. Findings reveal that the determinants with substantial economic importance and robustness are relatively scarce. However, each determinant pertains to one of five market imperfections—namely, taxes, distress costs, information asymmetry, agency costs, or supply frictions. From this comprehensive analysis the explanatory power of various capital structure theories were assessed. It provided stronger evidence in favour of the pecking order theory while offering less support for the traditional trade-off theory and agency theory (Fukui et al.,2022). The role of financial reporting quality in addressing a firm's over- and underleverage issues has been thoroughly examined. Previous studies have primarily focused on the observed capital structure; however, research indicates that financing frictions caused by adverse selection can create discrepancies between observed and optimal capital structures. Analysis based on deviations from a predicted model of optimal capital structure reveals that about one-third of firms with leverage exceeding their industry's median are underleveraged, while over 15% of firms with leverage below the industry median are overleveraged (Synn and Williams,2024). The review was done to analyse the entirety of capital structure theories to thoroughly understand the subject and facilitate effective management decisions in practice. It revealed that importance of determining the optimal capital structure lies in its ability to help company management maximize corporate capitalization and achieve long-term objectives. The review traces the evolution of capital structure and cost of capital theories from the mid-20th century, when the first quantitative theory emerged, to the

present day. It highlights that considering certain economic factors, such as variable income, frequent income tax payments, and advance tax payments, can align these theories more closely with practical application. Even the Modigliani-Miller theory, despite its numerous limitations, becomes more relevant in real-world economic practices when these factors are considered (Brusov and Filatova, 2023).

The studies have concentrated on firms in developed economies, leaving a gap in understanding how capital structure theories apply to firms in developing and emerging markets. There is a lack of research focusing on specific industries and the impact of leverage on various industries has not been extensively examined, providing an opportunity for future research to explore how different sectors respond to changes in capital structure (Bajaj et al.,2021).

The basic origin of the capital structure study is found beginning from the (MM,1958) study on cost of capital and capital structure, later various researchers have undertaken the study on capital structure according to their perspectives. The insights derived from the reviews reveals no significant impact of cost of capital on the capital structure of the firm. There is lot of ambiguity in understanding the variable impacting the capital structure of the firm and identifying the relation between cost of capital and capital structure of the firm. There is no single theory which can be unanimously relied in determining the capital structure of the firm. Those studies focus has been found in establishing consensus on the other factors like market type or different accounting measure as the reason impacting the capital structure but no considerable relation between capital structure and cost of capital has been investigated. In the presence of these complexities the present study covers the vast spectrum of cost of capital, capital structure and the determinants impacting the capital structure of the firm. The study further covers vividly the various prevalent theories which predict the capital structure financing of the firm. While general theories exist, there is limited research on how capital structure impacts cost of capital across different sectors. For example, technology firms might have different optimal capital structures compared to manufacturing firms due to varying risk profiles and growth opportunities. Also, most studies focus on developed economies. There is a gap in understanding how capital

structure decisions affect the cost of capital in emerging markets, where financial systems and market conditions differ significantly.

1.5. Research Objectives

The primary aim of this study is to investigate the patterns of capital structure within firms. Specifically, the study focuses on the following objectives:

i. **Expound the capital structure of the companies**:
   This objective involves the computation of capital structure of the companies and investigating the constituents of capital structure to understand their impact. This investigation is undertaken for individual companies and also for the industries individually.

ii. **Analyse Weighted Average Cost of Capital (WACC)**:
   This objective involves calculating the WACC for various firms and conducting a comparative analysis. By examining the WACC, the study aims to understand how different firms manage their cost of capital and the implications of these costs on their financial strategies. This analysis will help identify trends and variations in WACC across different industries and firm sizes.

iii. **Relationship Between Cost of Capital and Capital Structure**:
   The study seeks to explore the relationship between a firm's cost of capital and its capital structure. This involves analysing how different combinations of debt and equity financing affect the overall cost of capital. By understanding this relationship, the study aims to provide insights into how firms can optimize their capital structure to minimize their cost of capital and enhance financial performance.

1.6. Variables affecting Capital Structure

There are several external and internal factors which influence a firm's capital structure. To understand the impact of the cost of capital on a firm's capital structure, it is essential to consider the various factors that also play a role. These factors are elaborated upon below:

External factors are:

i. GDP growth
ii. Inflation rate
iii. Taxation
iv. Government regulations

Internal Factors are:

i. Size
ii. Tangibility
iii. Profitability
iv. Growth
v. Non-debt tax shield
vi. Liquidity
vii. Cost of capital
viii. Information Asymmetry
ix. Geographic location

All the above-mentioned variables cannot be computed at a certain point of time, like GDP growth rate and inflation rate which changes according to market, and other variables like information asymmetry, location of the firm cannot be assessed numerically. Thus, considering the restriction in the assessment of certain variables this study considers including tangibility, profitability, non-debt tax shield, liquidity and cost of capital from internal factors influencing the capital structure of the firm. Further, Table 1.1 accommodates the capital structure determinants identified by the researchers.

TABLE 1.1 Capital Structure Determinants

Sr. no	Author	Factors	Country	Findings
1	Rajan & Zingales (1995)	Tangibility,Size	G7 countries (US,Japan,Germany,France,Italy, UK and Canada	Tangibility and size are negatively related to leverage.
2	Mazanec,J (2023)	Liquidity	transport sector from the Central Europe	The high liquidity does not promote business performance, rather it considers the inability of the business to utilize funds for business development.
3	Li,H and Stathis,P(2017)	Growth, Tangibility, size, Profitability	Australian firms	Growth, tangibility, size and profitability are inversely related to leverage.
4	Ghardallou,W(2022).	Profitability	Saudi Arabia	Profitability is inversely related to debt.
5	Jaworski,J and Czerwonka,L(2022).	Non debt tax shield, Size, Growth, Tangibility	Energy industry companies in the European Union countries	Size, growth and tangibility are positively related to debt and NDTS is negatively related with debt.
6	Huckjun,Y et al.,(2022)	Growth, Tangibility	Korean and Greek shipping companies	Tangibility and growth are positively related to leverage, while profitability shows a negative relationship with leverage.
7	Li,L and Islam,S,Z.,(2018)	Profitability, size	Australian publicly listed companies	Profitability and size have significantly positive relations with debt.
8	Hoque,H and Pour,E,K.,(2018	Profitability, Size, Risk	347 large banks across 57 countries	Size and risk are positively related, and profitability is negatively related to bank leverage.

9	Dakua.S.(2019)	Tangibility, Profitability, Liquidity	Steel company, India	Profitability and liquidity have positive relationships with debt ratio, and there is a negative relationship between debt ratio and asset structure.
10	Lious,N,A,T et al.,(2016)	Non debt tax shield, Size	77 non-financial firms in Spain	Non debt tax shield and size are positively related to leverage.
11	Handoo and Sharma, (2014)	profitability, growth, tangibility, size, tax	870 listed Indian firms both private and government sector companies	Profitability, growth, tangibility, size and tax are significantly related to leverage.
12	Larry Li, and Islam,S.Z(2019)	size, profitability	Australian publicly listed companies	size and profitability have positive relation with debt
13	Shahzad,A et al.,(2020)	tangibility, profitability, liquidity, firm size	South Asian Association for Regional Cooperation (SAARC)	Positive relationships between tangibility, profitability, liquidity, firm size with firm leverage,

Source: Author's own contribution

1.7. Research Hypothesis:

The research hypothesis formulated are discussed hereunder:

Segment1:

The Research hypotheses are segregated in two segments based on the research objectives framed. Thus, to achieve the research objective1 and 2 the following hypotheses are developed.

i. Research Hypothesis 1: There is no significant difference between capital structure of the companies.

ii. Research Hypothesis 2: There is no significant difference between cost of capital of the companies.

Segment2:

This study considers the impact of certain variables identified on the capital structure of the firm. The research objective 3 aims to explore the impact of such identified variables on the capital structure of the companies. The hypotheses developed in order to achieve research objective 3 are as follows:

iii. Research Hypothesis 3: There is no significant relationship between profitability and debt-equity ratio.
iv. Research Hypothesis 4: There is no significant relationship between effective tax rate and debt-equity ratio.
v. Research Hypothesis 5: There is no significant relationship between liquidity and debt-equity ratio.
vi. Research Hypothesis 6: There is no significant relationship between tangibility and debt-equity ratio.
vii. Research Hypothesis 7: There is no significant relationship between cost of capital and debt-equity ratio.

1.8. Research Design

1.8.1. Study period

This study spans a comprehensive period of fourteen years, from 2010 to 2024. This timeframe was chosen to provide a robust analysis of capital structure patterns and their impact on firm performance over a significant duration. By covering this extended period, the study aims to capture the effects of various economic cycles, market conditions, and regulatory changes on the capital structure decisions of firms. The period from 2010 to 2024 includes multiple phases of economic growth and downturns. This allows the study to analyse how firms adjust their capital structures in response to changing economic conditions, such as the recovery from the global financial crisis, periods of economic expansion, and any subsequent recessions. Over these fourteen years, financial markets have experienced significant volatility and

shifts. By examining data across this period, the study can assess how market conditions, including interest rate fluctuations and stock market performance, influence firms' capital structure choices. The selected timeframe encompasses various regulatory developments that may impact capital structure decisions. This includes changes in tax policies, financial regulations, and corporate governance standards. It allows the study to evaluate the effects of these regulatory changes on firms' financing strategies. The period from 2010 to 2024 has seen rapid technological advancements and digital transformation across industries. This study aims to explore how these technological changes have influenced capital structure decisions, particularly in terms of investment in innovation and technology-driven growth. By examining a fourteen-year period, the study provides a comprehensive view of the dynamic nature of capital structure decisions and their long-term implications for firm performance. This extended timeframe ensures that the analysis captures a wide range of factors influencing capital structure, offering valuable insights for both academic research and practical financial management.

1.8.2. Data Sample

This study is based on the secondary data attained from the National Stock Exchange directory from NSE India. The sample for the study comprises of the 85 companies covering all the 9 sectors under NIFTY index which is shown under TABLE 1. 2.. The list is as follows—

TABLE 1.2 Companies under NIFTY Sectors

SR.NO	SECTORS	NO. OF COMPANIES
1	NIFTY AUTO	14
2	NIFTY ENERGY	9
3	NIFTY FMCG	13
4	NIFTY IT	6
5	NIFTY MEDIA	11
6	NIFTY METAL	14

7	NIFTY PHARMA	9
8	NIFTY REALTY	9
	Total	85

Source: Author's own contribution

1.8.3. Data Analysis

Data analysis involves three stages:

i. Examining input data.
ii. Producing output data.
iii. Evaluating output data.

i. Examining Input Data

The initial step involves a comprehensive examination of the input data. This process includes determining the costs associated with each source of finance, such as debt, equity, and other financial instruments utilized by the companies. Next, the Weighted Average Cost of Capital (WACC) is computed by assigning appropriate weights to each source of finance based on their proportion in the overall capital structure. Additionally, statistical analysis is performed on the input data to understand its characteristics. This involves calculating the mean, standard deviation, and coefficient of variation for key financial metrics. These statistics provide valuable insights into the central tendency, dispersion, and relative variability of the data.

ii. Producing Output Data

At this stage, the emphasis is on generating output data to evaluate its impact on the cost of capital and the overall value of the firm. Key calculations include determining the ratio of total debt to total equity to gauge the leverage levels of the companies and calculating the ratio of total share capital to total assets to understand the equity levels. Additionally, we estimate the values for various determinants of capital structure, such as WACC, tangibility, non-debt tax shield, liquidity, and profitability.

iii. Evaluating Output Data

The final stage involves evaluating the output data to identify trends and differences across industries. This is achieved through correlation analysis which examines the relationships between different financial metrics to understand how they are interrelated. Multiple Regression Analysis is used to identify the determinants of the cost of capital and how various factors influence it. Analysis of Variance (ANOVA) is applied to compare the means of different groups and determine if there are statistically significant differences between industries. By following these steps, we can gain a comprehensive understanding of the determinants of capital structure and their impact on the cost of capital for NIFTY companies during the period from 2010 to 2024.

1.9. Importance of the study

The relationship between capital structure and cost of capital is a significant area of study in finance for several reasons:

i. **Optimization of Financial Strategy**

Understanding this relationship helps businesses determine the optimal mix of debt and equity financing. An optimal capital structure minimizes the cost of capital, which in turn maximizes the value of the firm. This is crucial for making informed decisions about financing new projects, expansions, or acquisitions.

ii. **Cost Efficiency**

By identifying the right balance between debt and equity, companies can reduce their overall cost of capital. Debt is generally cheaper than equity due to tax benefits (interest payments are tax-deductible), but excessive debt increases financial risk. Striking the right balance can lead to significant cost savings.

iii. **Risk Management**

A well-structured capital mix helps in managing financial risk. High levels of debt increase the risk of bankruptcy, especially during economic downturns. Understanding the relationship between capital structure and cost of capital allows firms to manage this risk more effectively.

iv. **Investor Confidence**

Investors closely monitor a company's capital structure as it signals the firm's financial health and stability. A balanced capital structure can enhance investor confidence, leading to better stock performance and easier access to capital markets.

v. **Regulatory Compliance**

Different industries have varying regulatory requirements regarding capital structure. Understanding these requirements and their impact on the cost of capital ensures that companies remain compliant while optimizing their financial strategies.

vi. **Strategic Flexibility**

A well-managed capital structure provides firms with the flexibility to respond to market opportunities and threats. It allows companies to leverage debt when interest rates are low or issue equity when market conditions are favourable.

1.10. Limitations of the study

This research relies on secondary data from the National Stock Exchange Directory. Due to time and data availability constraints, the study is limited to 85 companies over a fourteen-year period. While studying the capital structure of NIFTY sector companies provides valuable insights, there are several limitations to consider

i. **Heterogeneity**: NIFTY sector companies span various industries, each with unique financial characteristics and capital structure norms. This heterogeneity can complicate the analysis and make it challenging to draw general conclusions.

ii. **Time Period**: The choice of the time period for the study can impact the results. Economic conditions, regulatory changes, and market dynamics vary over time, affecting capital structure decisions.

iii. **Data Availability**: Access to consistent and accurate financial data for all NIFTY companies can be a challenge. Missing or incomplete data can lead to biased results and limit the study's reliability.

iv. **External Factors**: Factors such as changes in government policies, interest rates, and global economic conditions can influence capital structure decisions. Isolating the impact of these external factors can be difficult.

v. **Industry-Specific Factors**: Different industries have varying risk profiles, growth opportunities, and financing needs. These industry-specific factors can affect capital structure and may not be fully captured in a broad study.

vi. **Market Sentiment**: Investor sentiment and market conditions can influence capital structure decisions. These subjective factors are difficult to quantify and incorporate into the analysis.

vii. **Regulatory Environment**: Changes in regulatory policies and compliance requirements can impact capital structure decisions. Keeping up with these changes and understanding their implications can be challenging.

1.11. Chapter Outline

This study is organised under five chapters which are briefly discussed hereunder: -

Chapter 1: Introduction

This chapter sets the stage for the study by outlining its design and objectives. It includes a detailed description of the data sources, the period covered (2010-2024), and the statistical tools employed. The significance of the study in understanding the relationship between capital structure and cost of capital for NIFTY companies is also highlighted.

Chapter 2: Theoretical Framework

This chapter delves into the theoretical underpinnings of cost of capital and capital structure. It reviews key theories such as the Modigliani-Miller theorem, Trade-Off Theory, and Pecking Order Theory. Additionally, it includes a comprehensive review of relevant empirical studies that have explored these concepts in various contexts.

Chapter 3: Research Methodology

Here, the research methods used in the study are explained in detail. This includes the selection criteria for NIFTY companies, data collection methods, and the statistical techniques used for analysis. The chapter also addresses any potential biases and limitations in the methodology.

Chapter 4: Empirical Analysis

Capital Structure Analysis

This chapter provides a detailed examination of the capital structure of selected industries within the NIFTY index. It analyses the composition of debt and equity, trends over the study period, and comparisons across different sectors. The impact of industry-specific factors on capital structure decisions is also discussed.

Cost of Capital Analysis

In this, the cost of capital for the selected companies is computed and analysed. It includes a comparative analysis across industries and individual units. The relationship between capital structure and cost of capital is explored, highlighting how different financing decisions impact the overall cost of capital.

Chapter 5: Summary and Conclusion

The final chapter provides a summary of the study's key findings and conclusions. It synthesizes the insights gained from the analysis and discusses their implications for theory and practice. Recommendations for future research and potential policy implications are also presented.

CHAPTER 2

LITERATURE REVIEW

2.1. Capital Structure

Capital is the most integral part for setting of a new business or for the continuing operations of an existing business. It is found that the financing decision is one of the most relevant decisions related to the operations of the company. Capital is utilised in the business functioning for purchase of assets which in turn generates revenue for the companies resulting into profits (Khan & Jain, 2014). Capital structure is the composition of different sources of finances through which the long-term funds requirement of the business could be raised. It constitutes the proportion of equity share capital, preference share capital, debentures, internal sources and other sources of funds which is required in the establishment of the business. The finance manager thus has a significant role in selecting a capital structure which maximises the shareholders wealth and minimises the overall cost of raising the capital. The present study covers all the existing long-term sources of finances in the companies which are equity share capital, preference share capital long term borrowings and debentures. It also investigates those variables which impacts capital structure of the firm.

The capital structure research finds its space of investigation from the prevalent theories of capital structure which develops an introspective opinion in the mind. It origins from (Modigliani & Miller, 1958) theory where it is proposed that under the assumption of perfect markets and in the absence of taxes on corporate income, the total market value of the firm is unaffected by leverage while there is another school of thoughts where (Myers,2001) argues the Modigliani-Miller theory and questions its credibility. It proposes that the value of the firm does depend on how its assets, cash flows and growth opportunities are sliced up and offered to investors as debt and equity claims. Myers (2001) holds no consensus with the perfect market argument and further

expresses that there is a novelty which is adopted persistently in the design of securities and in new financing schemes. He opines that innovation proves that financing matters. He believes that if new financing tactics never added value, then there would be no incentive to innovate.

There has been a remarkable trend notified in companies preferring to raise capital across the globe and mostly in United States. The companies bigger in terms of size prefer to consider leverage in financing than smaller companies. It is understood as investors considers investing in bigger companies due to diversification, lesser bankruptcy chance and rigorous scrutiny in bigger companies inviting more transparency and reliability (Strabulaev & Kurshev, 2015). In the study conducted by (Ben Shahar,1968) a model is worked considering a perfect capital market where the interest rate is held constant and, in the condition, where there is no tax, the investors show indifferent approach towards the firms leverage rate and prefers all stocks as perfect substitutes falling under specific risk class. These findings propagates that the market value of the firm and its cost of capital are independent of its capital structure. Rajan & Zingales (1995), Chen (2004) and Abor (2005) studies undertaken to investigate the impact of leverage on the firm's performance reveals most of them marks the negative effect of debt on the firm's performance. Although, the short-term debt may have positive impact and negative effect of long-term debt on the firm's performance (Ahmad, 2014). The higher the economic growth the less should be the leverage anticipated. The Capital Structure and its respective indicators are found playing a prominent role in corporate performance in the transport sector in the Visegrad Group from the Central Europe. The current ratio which represents cash to total assets has the positive impact on the profitability of the business. The high liquidity does not promote the business performance, rather it considers the inability of the business to utilise funds for business development. The other indicators like size of the firm says that medium sized firms in Hungarian transport sector invites investors interest for profitable investment. The location of the firm too has eminent role to play in which Hungarian companies were considered as the profitable investment locations from the Central Europe region (Mazanec, 2023).

An examination done for the publicly listed Australian firms covering the duration of 1984 to 2007 to analyse the factors that affect the leverage decisions reveals that

profitability, assets, industry leverage, growth, tangibility and capital expenditure are certain reliably important factors which are accountable for 22 percent variation in leverage in Australian firms. It elaborates some findings that leverage ratio falls with the increase in firm's size, higher growth invites lower debt levels, and the tangibility is inversely related with firm's leverage ratio, it depicts that firms which are more profitable prefers to maintain low leverage levels and firms having higher capital expenditure proportion tends to have less leverage (Li & Stathis, 2017). The size of the firm and profitability has the relevant impact on the capital structure of the firm also the firm's leverage ratio and firm specific variables vary across industries. The industry specific factors are found affecting the capital structure both directly and indirectly. It is found that GDP (gross domestic product) contribution influences significantly to capital structure. The leverage levels of the firm are relatively high when performing in economically significant industries. It is also brought into consideration that industry specific factors are the important determinants of the corporate capital structure (Li & Islam, 2019). Larger firms are predicted to have higher debt levels because they are less likely to go bankrupt. According to the Trade-Off Theory (TOT), larger firms, being more diversified and having more stable earnings, can handle higher debt ratios (Titman & Wessels, 1988). However, the Pecking Order Theory (POT) suggests that larger firms face greater information asymmetry, leading them to prefer equity over debt (Marsh, 1982). This results in a negative relationship between firm size and debt levels, as larger firms often finance through equity rather than debt (Deloof & Overfelt, 2008). Research shows mixed results: some studies find a positive relationship between firm size and capital structure (Al-Fayoumi & Abuzayed, 2009); (Yu and Aquino, 2009); (Du and Dai, 2005); (Eriotis et al., 2007); (Hovakimian, 2004), while others find no significant relationship (Karadeniz et al., 2009) or even a negative one (Rajagopal, 2011). Larger firms are seen as more diversified and less likely to fail, making size an inverse indicator of bankruptcy risk. Alternatively, size might indicate the amount of information available to outside investors, who may prefer equity over debt for larger firms (Rajan & Zingales, 1995). Firm size is often measured using the natural logarithm of total assets (Suto, 2003); (Driffield et al.,2007). Firms with high growth opportunities tend to prefer equity financing over debt to maximize profitable investments (Myers, 1977).

This leads to a predicted negative relationship between growth opportunities and leverage. The negative relationship is often attributed to using market-to-book value as a proxy for growth opportunities, as high market-to-book ratios indicate higher financial distress costs (Rajan & Zingales,1995). Growing firms demand more internal funds and often issue short-term debt to avoid information asymmetries, leading to higher leverage (Viviani, 2008). Fast-growing companies need and can borrow more. According to the Agency Theory (AT), financing helps solve free cash flow problems, so firms with more growth opportunities tend to have more debt. However, (Rajan & Zingales, 1995) found that such firms might prefer equity over debt, leading to a negative relationship between growth opportunities and leverage. The Trade-Off Theory (TOT) also suggests a negative relationship between growth opportunities and debt ratios (Lasfer, 1999). Research shows mixed results: some studies find a positive relationship between growth opportunities and debt ratios (Cassar & Holmes, 2003; Amidu, 2007; Heshmati, 2001), while others find no significant relationship (Karadeniz et al., 2009; Eriotis et al., 2007) or a negative one (Berens and Cuny, 1995; Ooi, 1999; Huang, 2006). Deesomsak et al. (2004) noted a negative relationship except in Australia. Growth opportunities are measured using sales growth (current year sales minus previous year sales, divided by previous year sales) and expected assets growth (current year assets minus previous year assets, divided by previous year assets).

The capital structure impact on firm performance has been analysed using the sample of 120 non-financial companies listed on Tadawul stock exchange for the duration of 2017-2020. The return on assets, return on equity ratios were employed to measure the financial performance, and Tobin's Q variables were used to map the accounting and market performance. The result shows that in the presence of high earnings the firm's prefers debt financing and the performance ratios predicts to avoid debt during the development phase of the business and high equity financing ratio is prevalent in higher profitable companies in contrast to lower profitable companies (Ghardallou, 2022). The debate on optimal capital structure has given rise to many significant studies in corporate finance. In this direction addressing the issue, based on cross-country panel data for 2004-2018 for high and low geared firms reveals that high gearing firms are comparatively low performers than the low gearing firms. It has been notified that high geared firms are financially less stable than its counterpart ones, as

it hints that additional debt can cause value destruction due to bankruptcy. Thus, depicting that weaker firm prefers higher debt financing to evade other sources of capital as it is believed that such firms has limited options for restructuring capital structure. It is also identified that such weaker firms might come across with the problem of corporate ownership. On choosing to finance with equity or preference shares. Hence, consider the option of debt financing to overcome the financial market barrier (Hossain, 2021).

It has been ascertained that default risk affects the corporate policies of a firm. A model developed in a limited liability entity with default constraint at an exponential random time founds the positive managing both dividend policy and capital structure to maximise the expected lifetime utility from the adverse use of risk averse equity investors. The study suggests the solutions of optimal policy involve paying dividends to keep the ratio of firms' equity value to investors' wealth below a certain level of criticality. It shows that the dividend pay-out acts as a preventive way to divert wealth from the firm to investors to reduce losses in the event of default. As it is observed from the findings that higher the default risk more assertively firm leverages and pays dividends (Tse,2020). Small and medium-sized enterprises (SMEs) dataset of Italian firms for the period 2006-2016 have been analysed to gauge the impact of global financial crisis on SME's capital structure decisions, which reveals the negative impact of credit supply shocks on the SMEs leverage. It also identifies that after the crisis Italian SMEs have decreased the usage of leverage significantly in comparison to pre-crisis period specifically short-term debt, this resulting into short term debt exposed to sensitive credit conditions than the long-term debt. It connects that in comparison to other firms the firms which are more profitable, bearing high risk has reduced the leverage content during the crisis than during the pre-crisis period.

Some financing facts:

i. The US financial corporations are found largely financed from internal funds constituting depreciation and retained earnings. The proportion of external financing is less than 20% and most of that is debt financing (Myers, 2001).

ii. The companies focussing on equity share capital for its financing are found to be riskier, smaller with prompt growth.

iii. The debt proportion is found to vary across countries. It has been observed in the developed economies that large integrated oil companies rely heavily on debt when it comes to external financing.
iv. The pharmaceutical companies are found performing at negative debt ratios.
v. The debt ratios measure low or negative in the presence of high profitability and business risks.
vi. Marketing and advertising- intensive companies such as Procter and Gamble have traditionally performed at low debt ratios where the profits are flowing from intangible assets (Barclay & Smith,1999).

2.2. Theories of Capital Structure

It has been observed that the firm's main activities begin with the capital structure formation and selecting a capital structure is not a random process rather it is governed by certain approaches influencing it. This section introduces the prevalent economic theories pertaining to capital structure research. These theories well explain capital structure management in different international contexts and are reasonable theories suitable as a theoretical starting point for this study.

2.2.1. Net Income Theory (NI Theory)

Durand (1952) propounded two capital structure theories namely NI approach and NOI approach. The NI approach focusses on the fact that increasing the proportion of debt in capital structure causes decrease in cost of capital and eventually increases the market value of the firm. It expresses that increase in degree of financial leverage, decreases the weighted average cost of capital with the proportionate increase in the debt content in total funds and which further inclines the value of firm. This approach is based on certain assumptions that there is no corporate tax, the cost of debt is less than cost of equity and the equity capitalisation rate and debt capitalisation rate is constant with no impact of risk. This theory emphasises that the value of firm is maximum at the point where cost of capital is minimum and for that it considers that debt usage to the maximum extent minimises the cost of capital.

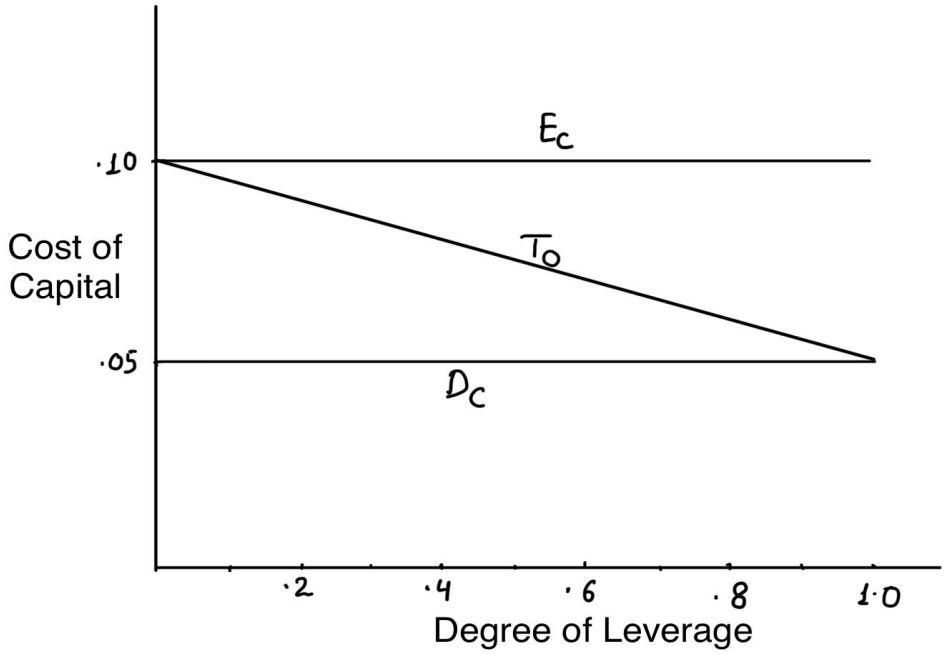

Figure 2.1 NI Theory

Source: NI Theory

In the figure 2.1, T_o= Overall cost of capital, E_c= Cost of equity and D_c= Cost of debt. The figure 2.1 clearly represents that as debt increases the cost of capital falls and the theory believes it is approachable to increase the debt content as it is cheaper source of finance in the firm's capital structure.

2.3.2. Net Operating Income Theory

This theory is vice-versa of NI approach. This approach believes that the market value of the firm is not affected by any change in the capital structure of the firm. It further states that the overall cost of capital is constant and does not believe in the existence of optimal capital structure and considers every capital structure as optimal one. This approach is based on the assumptions that cost of capital(T_o) remains constant irrespective of any change in leverage, 'T_o' and 'EBIT' (Earnings before interest and tax) are constant irrespective of leverage, the value of firm is not affected by the change in debt content in capital structure and the ratio of debt and equity does not impacts the value of firm as market capitalises the value of firm in a composite form. It is believed that the value of equity is the remaining value attained by subtracting the value of debt from the constant value of firm. The important findings of NOI approach

says that cost of equity rises with rise in debt content inviting risk to shareholders; and cost of debt, cost of capital and value of firm remains constant.

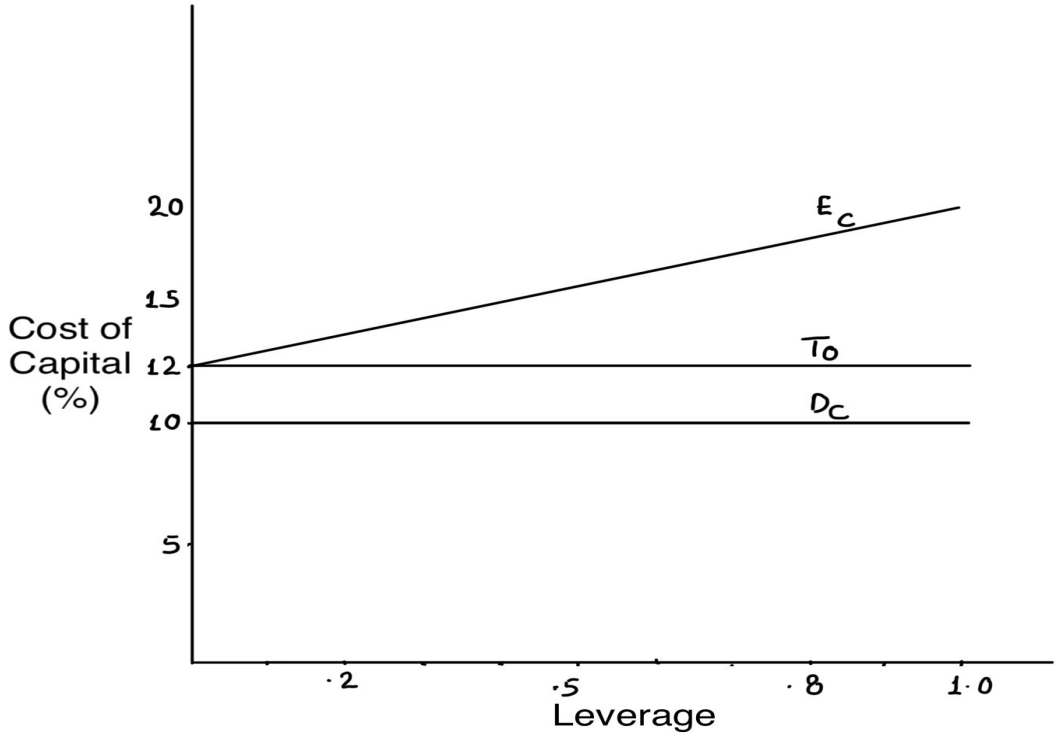

Figure 2.2 NOI Theory

Source: NOI Theory

In the figure 2.2, T_o= Overall cost of capital, E_c= Cost of equity and D_c= Cost of debt. The figure 2.2 shows that as the debt content increases on the X-axis, the cost of capital also increases anticipating the risk factor.

2.2.3. Traditional Approach

The traditional approach expresses that the cost of capital is influenced by the capital structure of the firm. It informs that there should always be a strategic use of both equity and debt in the capital structure. The increased use of financial leverage develops the risk for debt investors which increases the cost of raising debt and this phenomenon creates a financial risk in the minds of the equity investors too which results into increase in the cost of equity and thus increasing the overall cost of capital.

The approach clearly mentions that optimum capital structure is the position in which the cost of capital is minimum, and value of firm is maximum.

Ezra Solomon[1] posits that a firm can enhance its value and reduce its cost of capital by appropriately balancing debt and equity in its capital structure. He explains that the response of the cost of capital to changes in the capital structure can be categorized into three stages. In stage 1, the cost of equity (Ec) remains constant or increases marginally with the use of debt but not enough to negate the benefits of cheaper debt. Concurrently, the cost of raising debt (Dc) remains stable or increases insignificantly. This encourages the use of debt, which subsequently lowers the overall cost of capital (To) and increases the firm's value. In stage 2, the firm reaches an optimal level of leverage where any further increase in debt has a negligible impact on the cost of capital and the firm's value. This equilibrium is achieved because the rising cost of equity (Ec), due to anticipated financial risk, offsets the advantages of low-cost debt. During this period, there is a specific range in which the firm's value (Fv) is maximized, and the cost of capital (To) is minimized. In stage 3, increasing the proportion of debt beyond the optimal leverage point results in a decline in the firm's value (Fv) and an increase in the cost of capital (To). This occurs because investors perceive higher financial risk, leading to a significant rise in the costs of raising both debt and equity. The figure 2.3 below demonstrates the three stages of the above discussed scenario where E_c= cost of equity, T_o= cost of capital and D_c= cost of debt:

1: Solomon, Ezra, The Theory of Financial Management, New York, Colombia University Press, pp. 92-98.

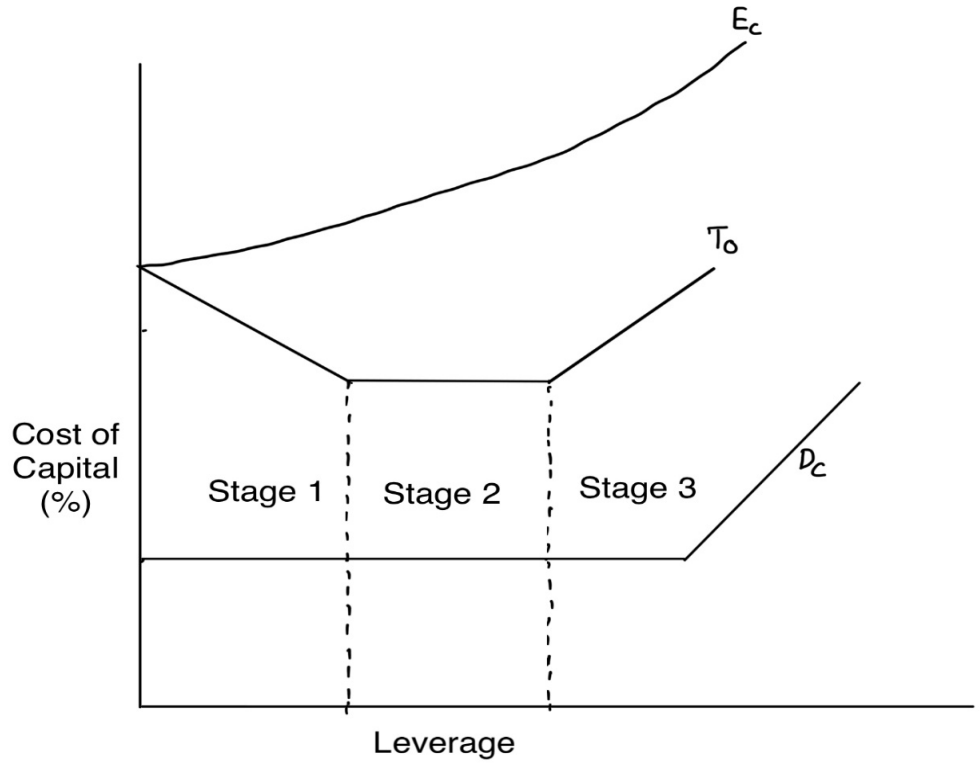

Figure 2.3 Traditional Theory

Source: Traditional Theory

2.2.4. Modigliani and Miller (1958) Theory

Franco Modigliani and Merton H. Miller diverge from traditional capital structure theory, positing that a firm's total cost of capital and market value are unaffected by its financing mix. MM (1958) theorem asserts that the cost of capital remains constant regardless of changes in the proportion of debt and equity in the capital structure. This theory is founded on several key assumptions: the existence of a perfect market where investors are well-informed about the risks and returns of securities, freedom for investors to buy and sell securities, and the classification of firms into homogeneous risk classes. Additionally, it assumes that investors have uniform expectations regarding a firm's net operating income, that the dividend payout ratio is 100% with no retained earnings, and that there are no corporate taxes. The Modigliani-Miller hypothesis introduces two propositions based on these assumptions. **Proposition I**

aligns with the Net Operating Income (NOI) approach, suggesting that the market value of a firm is determined by capitalizing its net operating income. This implies that the firm's net operating income and overall cost of capital are independent of its capital structure, leading to the conclusion that the firm's value should also be independent of its capital structure. The figure 2.4 below explains this:

Figure 2.4 MM (1958) Theory

Source: MM (1958) Theory

The MM hypothesis challenges the validity of the NOI approach, asserting that firms identical in every aspect cannot achieve different costs of capital simply by altering their capital structure or the value of the firm. To substantiate their argument, they provide an example: if an investor receives a higher return on an investment from one firm within the same risk class, the investor will sell his holdings in that firm and reinvest a proportional amount in another firm. This process would continue until both firms reach equilibrium. This phenomenon, known as arbitrage, indicates that the value of a firm and its cost of capital are not influenced by its capital structure. Proposition II asserts that the cost of equity is equivalent to the cost of capital plus an additional premium for the financial risk borne by the firm. This risk premium is calculated as the difference between the cost of capital and the cost of debt, multiplied by the debt-equity ratio. Consequently, Proposition II indicates that when debt is incorporated into

the capital structure, the advantage of debt is diminished because the cost of equity rises in response to the increased financial risk. This proposition is illustrated in the figure 2.4, which assumes a linear relationship between the cost of capital and the debt-equity ratio.

2.2.5. Modigliani and Miller (1963) Theory

Modigliani and Miller amended their previous argument in their article published in 1963. MM (1963) revised their earlier stance, acknowledging that leverage significantly impacts a firm's capital structure. They argued that increasing debt content lowers the cost of capital and enhances the firm's value. The revised theory, often referred to as the "tax correction" approach, posited that the market value of a leveraged firm is higher than that of an unleveraged firm due to tax deduction advantages on interest charges. Consequently, firms tend to favour debt financing to increase their value by incorporating more debt into their capital structure. Modigliani and Miller also recommended that firms should maintain a target debt ratio to maximize the benefits derived from prudent debt usage. Unchecked increases in debt usage could breach limits set by lenders, potentially offsetting the advantages of leverage. The figure 2.5 shows the above interpretation.

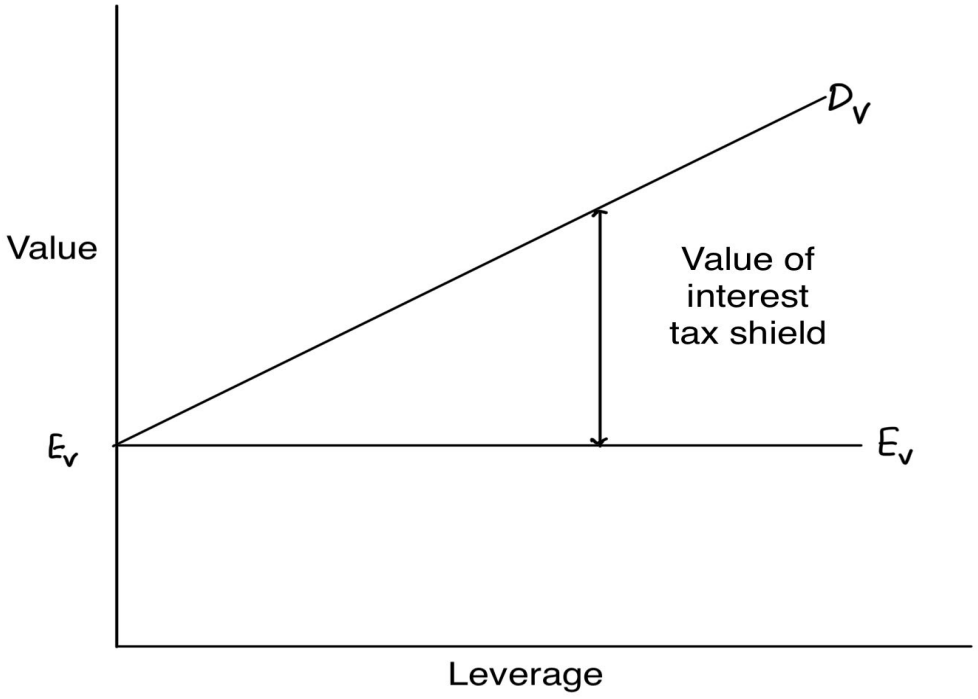

Figure 2.5 MM (1963) Theorem

Source: MM (1963) Theory

In Figure 2.5, D_v represents the value of debt, while E_v denotes the value of equity. The figure illustrates that a firm can enhance the value of an unlevered firm by adjusting its capital structure to include debt, thereby benefiting from associated tax advantages. The Modigliani-Miller (M-M) Hypothesis rests on several assumptions that have been critiqued. One key assumption is that investors can borrow and lend at the same rate, which is not realistic in practice. Critics argue that personal leverage cannot fully substitute for corporate leverage due to differences in liability—firms enjoy limited liability, while individuals do not. Moreover, the hypothesis overlooks the presence of transaction costs, which can impede the arbitrage process. Additionally, institutional investors, who often dominate the capital markets, may be unable to engage in personal leverage, further complicating the arbitrage process. The incorporation of corporate tax also challenges the hypothesis, as firms benefit from tax deductions on interest, lowering their effective borrowing costs. Consequently, the market value of a leveraged firm tends to be higher than that of an unleveraged firm.

2.2.6. Trade-Off Theory

The trade-off theory suggests that firms decide between equity and debt funding by weighing the costs and benefits of each. Initially proposed by (Fischer et al., 1989), this theory highlights the advantages of debt financing, such as tax shields, and acknowledges the costs associated with financial distress, bankruptcy, and higher interest rates. While debt offers tax benefits, it also introduces financial distress costs. Financial distress occurs when a firm struggles to make timely payments on its principal and fixed interest charges. Excessive debt use increases financial risk, potentially leading to insolvency. The direct cost of financial distress includes insolvency costs, which affect the insolvency proceedings. Anticipated insolvency costs can lead to higher interest rates on lending, negatively impacting the market value of equity. Additionally, financial distress can adversely affect employees, credit suppliers, shareholders, investors, and trigger opportunistic behaviour by managers, contributing to the indirect costs of financial distress. Consequently, financial distress disrupts the firm's overall value.

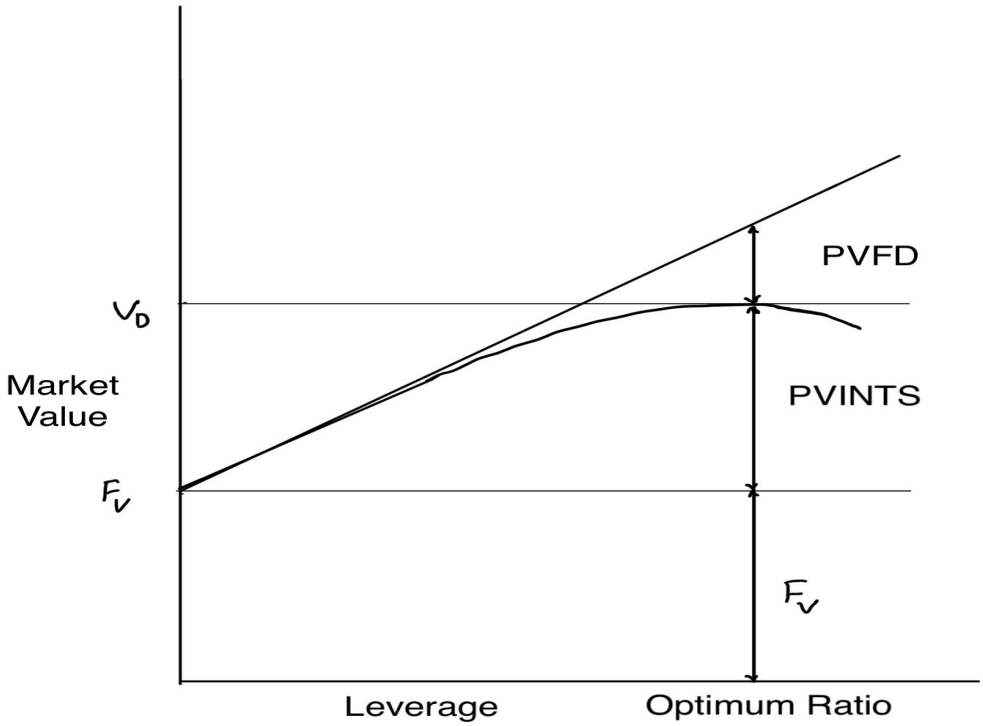

Figure 2.6 Trade-Off Theory

Source: Trade-Off Theory

In the figure 2.6, V_D= value of debt, F_V= Value of firm.

Figure 2.6 illustrates the impact of financial distress. With moderate use of debt, the cost of financial distress is minimal, leading to an increase in the firm's value. However, as debt usage rises, the cost of financial distress escalates significantly, while the tax benefits diminish considerably. The optimal point, where the firm's value is maximized, is achieved when the present value of the tax shield is equal to the cost of financial distress.

2.2.7. Pecking Order Theory

Pecking Order Theory posits that firms prefer internal financing over external financing. The theory, as discussed by (Chakrabarti and Chakrabarti, 2019), identifies information asymmetry as a key driver, which tends to increase the cost of capital. This asymmetry exists between a firm's managers, external parties, and investors, leading to the adoption of the pecking order approach. The theory is evident in the way firms structure their capital. Managers, who possess comprehensive knowledge of the firm's health, strategically decide the method of raising capital. They opt for debt when the firm can manage its fixed charges and choose equity when market prices are favourable. Myers (1984) coined the term "pecking order theory" to describe this hierarchy, where there is no definitive debt-equity target, but rather a preference order: internal equity is prioritized, followed by debt, and external equity is considered the last resort. This theory implies an inverse relationship between profitability and debt ratio, although it does not adequately explain variations in capital structure across different industries.

2.2.8. Agency theory

Agency theory elucidates the costs and expenses arising from conflicts of interest within a firm. Jensen and Meckling (2019) identify two primary types of conflicts. The first conflict is between shareholders and managers, stemming from the fact that managers do not hold 100% of the residual claims. Consequently, managers do not fully benefit from profit-enhancing activities yet bear all associated costs. For

example, managers might exert less effort in resource management or use company assets for personal gain, such as indulging in luxuries like corporate jets and lavish offices. Since managers incur the full cost of avoiding these activities but only reap a fraction of the benefits, they may overindulge, thereby diminishing firm value. Harris and Raviv (1991) observed that this inefficiency decreases as the manager's ownership stake in the firm increases. As the proportion of the firm financed by debt rises, the manager’s equity share also increases, thereby reducing the conflict between managers and shareholders. Additionally, as (Jensen, 1996) points out, debt necessitates regular cash payments, thereby restricting the "free" cash available for managers to misuse. This reduction in conflicts between managers and shareholders is a significant advantage of debt financing. Conflicts between debtholders and equity holders arise because debt agreements incentivise equity holders to invest sub optimally. Specifically, if an investment yields high returns exceeding the debt's face value, equity holders reap most of the profits. However, if the investment fails, debtholders bear the loss due to limited liability. This dynamic encourages equity holders to undertake very risky projects, even if these reduce overall firm value, thereby decreasing the value of the debt. The equity value loss from a poor investment can be offset by gains at the expense of debtholders. This cost is ultimately borne by equity holders when the debt is issued, assuming debtholders correctly anticipate their behaviour. Consequently, equity holders receive less for the debt than they otherwise would. This phenomenon, known as the "asset substitution effect," represents an agency cost of debt financing. Jensen and Meckling argue that an optimal capital structure can be achieved by balancing the agency costs of debt against its benefits.

Several implications arise from this theory. Firstly, bond contracts are expected to include provisions that deter asset substitution, such as interest coverage requirements and restrictions on investing in new, unrelated business ventures. Secondly, industries with limited opportunities for asset substitution will generally exhibit higher debt levels, all else being equal. For instance, the theory predicts that regulated public utilities, banks, and firms in mature industries with few growth opportunities will be highly leveraged. Thirdly, firms experiencing slow or negative growth but generating large cash inflows from operations should carry more debt. In the absence of attractive

investment opportunities, substantial cash inflows may lead to wasteful expenditures on perks, empire-building, and overpaying subordinates. Increasing debt reduces the amount of "free cash" available and raises the manager's ownership stake in the residual claim. According to Jensen, industries with these characteristics today include steel, chemicals, brewing, tobacco, television and radio broadcasting, and wood and paper products. The theory suggests that these industries should be characterized by high leverage.

2.2.9. Market Timing Theory

In 2002, Baker and Wurgler expanded upon Modigliani and Miller's (1958) work by introducing the equity market timing theory. This theory posits that companies issue shares when their market-to-book value is high and repurchase shares when prices are low. In efficient markets, as Modigliani and Miller proposed, switching between different types of capital offers no advantage because investors act rationally. However, in inefficient markets, firms can exploit market timing to benefit from irrational shareholders who buy or sell at inopportune times. Companies can take advantage of temporary fluctuations in their market-to-book value to raise capital more affordably with equity rather than debt. According to this theory, there is no single optimal capital structure. Unlike the static trade-off theory, which suggests a fixed target, market timing theory implies that capital structure is shaped by managers' efforts to time the market. Managers who issue or repurchase equity based on market fluctuations do not need to reverse these actions when the market stabilizes. Therefore, temporary changes in market-to-book value can lead to lasting changes in a company's capital structure. Baker and Wurgler concluded that capital structure results from ongoing attempts to time the equity market.

According to (Baker and Wurgler, 2002), there are two versions of equity market timing theory:

1. Adverse Selection Costs: Based on (Myers and Majluf, 1984), this version suggests that the costs of raising equity fluctuate over time. When these costs are lower than the cost of debt, managers can issue equity at a lower cost. This

dynamic relationship allows firms to raise capital more cheaply during periods of lower adverse selection costs.

2. Share Mispricing: This version focuses on irrational investors and fluctuating share prices. Managers issue equity when they believe the share price is undervalued and buy back shares when they think the price is overvalued. Empirical evidence, such as the positive relationship between market-to-book ratios and net equity issues, supports this version. It does not require markets to be inefficient or managers to time the market perfectly; it only requires managers to believe they can time the market.

2.2.10. Empirical studies on capital structure

There are many studies which support both the Modigliani-Miller and traditional views. Modigliani-Miller and Barges used simple regression techniques, while Weston highlighted specification bias and employed multiple regression. Modigliani-Miller also used the two-stage least squares method to test their hypothesis, considering the tax effects of debt financing. Other researchers, including Sarma and Rao, Rao C. and R. Litzenberger, Pandey,I.M, Wippern and many other tested the Modigliani-Miller hypothesis using various leverage variables. This part reviews key empirical studies conducted in India and abroad.

Modigliani and Miller (1958) introduced their hypothesis, stating that a firm's value and cost of capital remain unaffected by its capital structure in the absence of corporate income tax. This means that adding debt will not increase the firm's value, as the lower cost of debt is balanced by a higher cost of equity. They also provided behavioural evidence supporting this independence. Using data from 43 electrical companies from 1947-48, they tested their hypothesis with a linear regression model. The regression analysis showed that the overall cost of capital for electrical utilities in 1947-48 was 5.3%. The increase of 0.006% per unit of additional financial leverage was statistically insignificant, as its standard deviation was larger than the coefficient. Modigliani and Miller concluded that the overall cost of capital remained constant, given the insignificance of the slope. They found similar results for 42 oil companies in 1953.

However, Modigliani and Miller found that the slope for the cost of equity capital was significant. This offset the lower-cost debt, keeping the overall cost of capital constant. They used this model to support their findings. Modigliani and Miller concluded that as financial leverage increases, the cost of capital rises enough to offset the lower cost of debt, keeping the overall cost of capital constant. The hypotheses made by MM were criticised on the grounds that sample firms in the electric utilities and oil industries have diverse characteristics and do not represent a homogeneous risk class. There were many sample observations which have little or no debt. Modigliani and Miller acknowledged the limitations of their work and considered their findings suggestive rather than conclusive. Modigliani and Miller (1963) revised their earlier position, acknowledging that favourable financial leverage can reduce a firm's overall cost if corporate taxes are present. They argued that a levered firm's value exceeds that of an unlevered firm because interest is tax-deductible, increasing income for investors. Their study included 63 electric utilities over the years 1954, 1956, and 1957 to analyse the impact of leverage and other variables on the cost of capital. Modigliani and Miller suggested using expected future earnings, which are not directly measurable, instead of reported earnings to avoid biases in statistical results. They employed a two-stage instrumental variable approach: first, they regressed reported earnings on variables like size, growth, debt, preferred stock, and dividends; second, they used the computed earnings from this regression in place of reported earnings. Their findings showed that the coefficients of debt and preferred stock were insignificant, supporting their hypothesis that leverage is significant only due to tax advantages. There were certain limitations observed from Modigliani and Miller's second. Gordon (1967) questioned its relevance to regulated electricity utilities, which do not provide perfect markets essential to their model. Like their first study, it had many observations within a narrow 50-70% debt-equity ratio range. Weston (1963) argued their findings contradicted observed facts.

Barges (1962) conducted a comprehensive test of the (Modigliani-Miller, 1958) hypothesis, analysing the relationship between the average cost of capital and leverage, as well as stock yield and debt-equity ratio, using cross-sectional data from the railroad, department store, and cement industries. Key features of his study included

that unlike Modigliani and Miller, his observations covered a wide range of capital structures, with many samples having little or no debt. He ensured homogeneity among sample firms to avoid distorting relationships. Barges criticized Modigliani and Miller for using market value, which he believed biased the leverage coefficient. Instead, he used book value measures of leverage, providing three reasons for this choice. The results of his study indicated that the average cost of capital initially decreases and then increases as the proportion of debt in the capital structure rises. Barges selected five sub-samples, each holding one key variable constant, and used two models to test the stock yield hypothesis. Barges found that the correlation coefficient was not significant at the 5% level for Model I, but it was significant for Model II. He also conducted regressions on observations with moderate leverage ratios, which showed results not significantly different from zero. Including the squares of the leverage term in the regressions neither supported nor contradicted the Modigliani-Miller hypothesis. In his study of departmental stores, leverage ratios were calculated similarly to those in the railroad industry, and the results supported the traditional theory. His final test in the cement industry, involving 34 companies with little or no debt, also supported the traditional view. However, Barges did not include important explanatory variables such as size, growth, payment, and earnings variability, which affect leverage and the cost of capital. Without controlling these variables, the validity of his results is questionable. Also, the accuracy of Barges' results relies on his use of the book value measure of leverage.

Weston (1963) refined Modigliani and Miller's empirical work by including firm size and growth to determine the overall cost of capital. Weston regressed the equation on 59 utilities for the year 1959 and found that the financial leverage variable (F/C) had a significant negative sign, supporting the traditional saucer-shaped overall cost of capital function. Similar results were found using pre-tax and excluding preferred stock from the debt-equity ratio. However, the study lacked other important explanatory variables such as payout ratio and earnings variability.

Ben-Shahar (1968) investigates a firm's capital structure using two main parameters: the expected return on its stocks and their standard deviation. It discusses the link between the firm's capital structure and the efficient opportunity curve of yield versus risk, identifying the range of efficient capital structures. The capital structure theorem

is introduced, asserting that the firm's cost of capital remains constant within the efficient range but increases in the inefficient range. This range is influenced by the market structure of interest rates, shaping the cost-of-capital curve. In a perfect capital market with stable interest rates, any capital structure is efficient, and the cost of capital stays constant. However, if the firm's borrowing rate increases while the investor's rate remains unchanged, the efficient capital structure range is restricted. The highest efficient financial leverage is achieved when the firm's marginal borrowing rate matches the investor's rate. The analysis assumes that investors can allocate their capital with any proportion of borrowed funds, either in a single stock or a mixed portfolio of that stock and risk-free bonds. This approach aligns with existing literature on capital structure. The model allows for a broader examination of a firm's capital structure, integrating finance theory with investor behaviour theory.

Sarma & Rao (1969) study examines the Modigliani-Miller (MM) theory, which posits that a firm's value is unaffected by its capital structure when accounting for the tax benefits of debt interest. MM's valuation model includes the tax advantage in the dependent variable. In regulated industries, MM found a zero coefficient for leverage, contradicting their theory because income tax is an expense for American electric utilities. Conversely, in non-regulated industries, a zero coefficient supports MM's theory. Our results show that the debt variable's coefficients are significantly above zero over three years, indicating non-tax benefits of debt. This suggests that investors favour corporate over personal leverage, increasing a firm's value up to a prudent leverage level.

Kraus and Litzenberger (1973) says that in ideal capital markets, a firm's market value doesn't depend on its capital structure. However, taxes on corporate profits and bankruptcy costs are key imperfections affecting leverage's impact on market value. Modigliani-Miller showed that if a firm can always meet its debt obligations, its market value increases linearly with debt. Hirshleifer (1964) expresses that without bankruptcy costs, minimizing taxes boosts market value. But both taxes and bankruptcy costs must be considered for optimal leverage. This finding integrates the tax benefits of debt and bankruptcy costs into a state preference framework. It shows that a levered firm's market value equals its unlevered value plus the corporate tax rate times the debt's market value, minus the present value of bankruptcy costs adjusted

for the tax rate. Unlike traditional valuation methods, if debt obligations exceed earnings in some scenarios, the firm's market value isn't necessarily concave.

Pandey (1981) examined the impact of financial leverage on shareholders, cost of capital, and capital structure theories using data from four Indian industries (cotton, chemicals, engineering, and electricity) covering 131 companies over the years 1968, 1969, and 1970, as well as pooled data. A comprehensive regression analysis was conducted to assess the effect of capital structure on the cost of capital. The findings align with traditional theory, showing that the cost of capital initially remains unchanged with capital structure changes but gradually increases. The study aimed to validate or refute Modigliani and Miller's independent hypothesis rather than measure the cost of capital.

Parsons & Titman (2009) research on capital structure reveals that larger firms with more tangible assets use more debt, while profitable firms with high market-to-book ratios and high R&D expenses use less debt. Debt ratios vary based on the costs and benefits of debt financing.

2.3. Determinants of Capital Structure

Understanding the determinants of capital structure is crucial for comprehending how firms strategically manage their financial resources to optimize their overall value. Several key factors influence a firm's capital structure decisions, each contributing uniquely to the financial dynamics of a company. Among these determinants, profitability, non-debt tax shields (NDTS), liquidity, cost of capital, and tangibility stand out as significant variables that shape how firms balance debt and equity. Analysing these determinants provides valuable insights into the intricate process of capital structure management and the strategic financial decisions that firms make to achieve long-term sustainability and growth.

2.3.1. Profitability

The relationship between profitability and leverage varies across different theoretical frameworks. Pecking Order Theory suggests that firms prefer using internal funds over external ones, leading to lower leverage for more profitable firms. Highly profitable companies tend to finance their investments with retained earnings rather than debt. Lemmon & Zender (2010) concluded that when firms need external funds, they prioritize debt over equity issuance, aligning with the pecking order theory's explanation of financing behaviour. Conversely, the trade-off theory argues that more profitable firms should maintain higher leverage to benefit from tax shields. According to this theory, profitable firms face lower bankruptcy risks, making them more attractive to creditors. Research by (Leland & Pyle,1977) found a significant positive relationship between leverage and profitability due to information asymmetry. Free Cash Flow Theory proposes that profitable firms should use more debt to discipline managers and prevent inefficient spending. Debt obligates the firm to make regular cash payments, limiting the "free" cash available for managers to misuse, as (Jensen,1996) notes. Additionally, empirical studies present mixed findings: Fama & French (2002) found that more profitable firms tend to have less debt, using short-term cash flows to pay off debts. This finding is supported by many studies, including those by (Abor & Biekpe, 2009), (Lemmon & Zender, 2010), and (Ezeoha, 2011). (Abor, 2005) discovered that profitability is positively linked to short-term debt ratios but negatively linked to long-term debt ratios. Chittenden and Hutchinson (1996) found no significant relationship between long-term debt ratios and profitability but noted that small firms show a negative relationship between profitability and both short-term and total debt ratios. Smaller corporations often have lower sales margins compared to larger ones due to higher operational costs and the need to offer lower prices to compete with established brands. However, they usually exhibit higher total asset turnover, meaning their asset productivity is like larger corporations. While a higher debt-to-asset ratio can boost returns for smaller firms if the productivity of assets exceeds the cost of debt, this advantage is often neutralized by higher interest rates for smaller borrowers. Consequently, the return on net worth is generally similar across corporations of different sizes. This dynamic aligns with the nature of capital markets,

which tend to balance returns across various investments (Gupta, 1969). Overall, the results indicate no consistent relationship between capital structure and profitability. Profitability in this study is measured by return on assets (earnings before interest and taxes divided by total assets).

2.3.2. Liquidity

The relationship between liquidity and capital structure has been a focal point in corporate finance research. Liquidity, defined as the ease with which assets can be converted into cash, plays a crucial role in a firm's financing decisions. According to the trade-off theory, firms aim to balance the tax benefits of debt against the costs of financial distress. More liquid firms might favour equity financing because it reduces the need for maintaining costly liquid assets. Research by Lipson & Mortal (2009) demonstrated that firms with more liquid equity tend to have lower leverage, opting for equity financing due to lower issuance costs. Anderson & Carverhill (2011) examined optimal cash holding policies and their impact on leverage, finding that liquidity affects a firm's ability to raise cash, and the costs associated with unwinding capital. Aljamaan's (2018) review underscored the importance of liquidity in determining capital structure, noting that firms with higher liquidity typically exhibit lower debt-to-equity ratios. These findings consistently indicate that liquidity is a significant determinant of capital structure, with more liquid firms leaning towards equity financing, thereby reducing their leverage and associated costs. In this study, liquidity is measured as the ratio of current assets to current liabilities.

2.3.3. Non-Debt Tax Shield

Companies primarily incur debt for their tax benefits. Tax shields reduce taxable income through deductions like depreciation, amortization, and R&D expenses. Non-debt tax shields (NDTS) exhibit an inverse relationship with debt in the capital structure. Studies by (Jairo, 2008), (Gonzalez & Gonzalez, 2012) and (Chaklader & Chawla, 2016) found a significant negative relationship between NDTS and debt. DeAngelo & Masulis (1980) argue that changes in tax regimes or inflation, which

reduce the real value of tax shields, prompt firms to increase their debt. The negative relationship between leverage and NDTS arises because NDTS substitutes for debt-related tax shields. Cross-sectional analysis shows that firms with fewer investment-related tax shields use more debt. The impact of NDTS varies by firm size, affecting smaller firms more significantly than larger ones. Hence, it is essential to re-examine the role of non-debt tax factors in capital structure. Higher corporate tax rates encourage companies to take on more debt to benefit from tax deductions on interest payments. Modigliani & Miller (1963) observed that firms prefer debt due to these tax advantages, with borrowing gains increasing as tax rates rise (Antoniou et al., 2008). Therefore, a positive relationship between tax rates and debt is anticipated. According to the Trade-Off Theory (TOT), income tax positively influences debt levels (DeAngelo & Masulis, 1980). Graham (1996) also found a significant positive link between effective tax rates and long-term debt ratios, indicating that taxes impact financing decisions. However, Antoniou et al. (2008) argued that the relationship between tax rates and debt ratios can be negative, depending on a country's tax regulations. Studies by (Karadeniz et al., 2009) and (Sogorb-Mira, 2005) support this negative relationship. Huang (2006) concluded that there is no consistent relationship between tax rates and debt levels in capital structures. In this study, NDTS is measured as Depreciation/Total Assets.

2.3.4. Cost of Capital

The cost of capital represents the return a company needs to generate to satisfy its investors, while capital structure refers to the mix of debt and equity used to finance the company's operations. According to (Modigliani & Miller, 1958), in a world without taxes, bankruptcy costs, and asymmetric information, the cost of capital is independent of the capital structure. Trade-Off theory suggests that firms balance the tax benefits of debt with the costs of financial distress. Optimal capital structure minimizes the overall cost of capital. According to the pecking order theory firms prefer internal financing first, then debt, and finally equity, as each source has different costs and implications for control. Ben-Shahar (1968) presents the capital structure theorem within the framework of investors' behaviour towards return and risk. It

suggests that the cost of capital is a U-shaped function of the capital structure in a world with taxes. Anderson & Carverhill (2011) explores the optimal cash holding policy and its impact on leverage, finding that liquidity influences a firm's ability to raise cash and its cost of unwinding capital. This explains that the cost of capital encompasses the cost of both equity and debt, weighted according to the company's preferred or existing capital structure. It consistently shows that the cost of capital is influenced by the capital structure. In this study the cost of capital is measured as the weighted average cost of capital (WACC) which is calculated as the weighted average of costs of separate sources of funds.

2.3.5. Tangibility

Firms with substantial physical assets are perceived as less risky by creditors and have higher asset values in bankruptcy situations. Consequently, these firms can secure more debt, illustrating a positive relationship between asset tangibility and leverage. Fixed assets, often acquired through debt, serve as collateral for creditors during liquidation. Intangible assets also contribute to a firm's debt capacity, collectively forming the asset structure (Schwarz & Aronson, 1967). According to the agency cost theory, shareholders in leveraged firms might invest sub-optimally (Titman & Wessels, 1988). The Trade-Off Theory (TOT) posits that firms with more tangible assets tend to have higher debt levels because these assets can be used as collateral in bankruptcy, thereby attracting more debt. Research findings on this topic are mixed. Some studies, such as those by Chiang et al. (2010), Al-Najjar & Taylor (2008), Teker et al. (2009), Deloof & Overfelt (2008), Mitton (2008), Heshmati (2001), Viviani (2008), Antoniou et al. (2008), and Frank and Goyal (2003), indicate a positive relationship between asset structure and long-term debt. In contrast, other studies, such as those by Al-Fayoumi & Abuzayed (2009), show no significant relationship, while Sheikh & Wang (2011) even report a negative one. Furthermore, some research, including that by Amidu (2007) and Abor & Biekpe (2009), suggests a negative relationship with short-term debt but a positive one with long-term debt. Booth et al. (2001) also support this view. In this study, asset structure is measured as fixed assets divided by total assets.

2.4. Cost of Capital

The cost of capital for a project is the discount rate used to evaluate its cash flows. It represents the minimum return required on the funds invested, which is determined by the project's risk level.

Cost of Capital is expressed as-

"Cost of Capital is the minimum rate of return that a proposed investment must give to make it an acceptable project from the standpoint of the current owners of the firm".

by Sarma and Rao (1969).

"The cost of capital of the firm is the weighted average of the expected market rate of return on the firm's equity capital and the market rate of interest on its debt".

by Ben Shahar (1968).

Modigliani and Miller (1958) study has been a turning point in the research direction towards the concepts of cost of capital. The two propositions propounded by Modigliani and Miller are of great significance. The proposition I highlights the cost of capital to be same irrespective of degree of leverage. The proposition II given by Modigliani and Miller states that the earnings/price ratio on the common stock of a company in each risk class is a linear function of leverage. Modigliani and Miller (1958) study propose that the cost of capital of a firm is unaffected by the market value of the firm and also the capital structure of the firm does not impact the cost of capital. The MM proposition I asserts that firm cannot reduce its cost of capital and increase the market value of stream it generates through obtaining its capital structure from different sources believing that the debt is cheaper source of finance.

MM (1963) study on corporate finance policy attempts to modify the previous conclusions from the (MM,1958) study and emphasizes on the tax advantages of debt financing and also on the effects of leverage in the capital structure. It further specifies that corporations should not necessarily seek for only debt financing in their capital structure. The capital structure financing is ascertained not only since tax advantage as there are limitations imposed by lenders and also are several kinds of costs

accompanied. Such consideration under the purview of the need for preserving flexibility highlights the need for maintenance of reserve by the corporations of untapped borrowing power. The findings under (MM,1963) study points that there has not been any substantial reduction in the optimal size of that reserve due to the tax advantage available on debt and the data does not reveal any remarkable increase in debt usage during high tax years.

A test undertaken to gauge the influence of leverage on the cost of capital is also examined by (Weston, 1963). It investigates electrical utilities industry where there is less instability of earnings as compared to the (MM,1958) sample of oil companies which is considered to have great variation among firms in earnings stability and great instability of earnings for individual firms. It reveals that the multiple regression analysis of the influence of leverage and growth on the cost of capital strongly indicate that leverage does have an influence on a firm's cost of capital. It also suggests that the traditional theory of business finance remains a better predictor than the Modigliani and Miller propositions of the real-world analysis. It also highlights the weakness of the (MM,1958) empirical studies which is found lacking in establishing the relationship between leverage and the other factors influencing a firm's cost of capital.

The inference drawn from the optimal capital structure research by (Robicheck and Myers, 1966) reveals that the leverage is not affected by the growth trends or heterogeneous investor expectations. On examining the problem of optimal capital structure it has been identified that in the absence of taxes, the value of the firm will not change for moderate leverage levels but will decline with high degrees of leverage and there exists an optimal degree of leverage in the presence of taxes without claiming the market imperfections which are supposed to prevent the arbitrage process described under (Modigliani and Miller, 1958) assumption. He further expresses that the optimal division of debt financing between various classes of securities is irrelevant, regardless of whether corporate income is taxed. It is further classified that this interpretation does not apply to the choice between debt and preferred stock as the preferred stock undergoes different tax treatment on dividends.

Using (Modigliani and Miller's, 1958) model, it was found that debt impacts a firm's value and cost of capital more than just providing tax benefits. In the Indian Engineering Industry, leverage significantly enhances firm value beyond tax

advantages, contradicting MM's leverage hypothesis. There is an optimal capital structure where introducing debt is beneficial. Management aims to maximize economic welfare for shareholders by maintaining an optimal debt-equity ratio (Sarma and Rao, 1969).

A comparative analysis was conducted to examine how capital structure, particularly leverage, affects the cost of capital in 28 Indian utilities and 77 American utilities. The study found that for American utilities, the cost of capital remains unaffected by capital structure, except for the tax benefits of debt. Additionally, investors showed no preference regarding the firm's dividend policy. The regression analysis indicated that payout ratios and firm size were not significant at the 0.05 level, while growth had a significantly negative coefficient each year. The results from American utilities serve as a benchmark for assessing the efficiency of the Indian capital market, which is less developed. The cost of capital for Indian utilities was approximately three times higher than that for American utilities. This disparity is attributed to the inefficiencies in the Indian capital market, the uncertainties faced by Indian utilities, high inflation, and limited venture capital. The study concludes that the theorem stating the cost of capital is independent of capital structure, after accounting for the tax benefits of debt, does not hold true in the context of a developing economy like India, where market imperfections are more prevalent (Rao and Litzenberger, 1971).

Gitman and Mercurio (1982) surveyed 177 Fortune 1000 firms to understand current practices in measuring and using the cost of capital. They found that the actions of these firms did not align with contemporary financial theory. Moore and Richart (1983) analysed the use of various financial techniques and found that 86% of surveyed firms used time-adjusted capital budgeting methods. Bierman (1993) surveyed 74 Fortune 100 companies and reported that most used some form of discounting in their capital budgeting, with 93% using a weighted average cost of capital. Trahan and Gitman (1995) surveyed 84 large Fortune 500 firms and Forbes 200 best small companies, finding that 30% of respondents used the Capital Asset Pricing Model (CAPM).

To evaluate the stability of the optimal capital structure, sensitivity analysis indicates that the risk-free rate and total debt significantly influence the weighted average cost of capital (WACC), while total capitalization greatly affects the company's enterprise

value. Using Monte Carlo simulation and sensitivity analysis, it was found that increasing the proportion of debt reduces the WACC. The study observed that raising debt usage to 69% optimizes the company's value and minimizes WACC. It also highlights the importance of monitoring the risk-free rate and total capitalization (Kulikov et al.,2023). Companies in the energy sector show a strong interest in WACC because it accounts for the complexity and long-term nature of their investments, as well as various economic, social, and geopolitical risks. WACC is a key concept in corporate finance, viewed as an opportunity cost that should match or exceed the profitability of alternative investments. The choice of financing sources depends on their cost and the company's financial structure, aiming to minimize WACC. When calculating WACC, firms must decide whether to use book values or market values for their funding sources (Dobrowolski et al.,2022).

2.5. Cost of Capital Estimation

The estimation of the cost of capital for each component of a firm's capital structure is an essential process in financial management. This process involves calculating the cost of various sources of financing—equity, debt, and any other financing instruments the firm might use. By accurately estimating these costs, firms can determine their overall cost of capital, which is crucial for making informed investment decisions, evaluating financial performance, and optimizing their capital structure.

The cost of capital of each component constituting the capital structure is estimated as follows:

2.5.1. Cost of Equity share capital

The cost of equity share capital also known as cost of equity (Ec) is computed by the following methods

The cost of equity, denoted as, (E_c) is the discount rate that aligns the market value of equity with the present value of expected returns. These returns can be in the form of dividends or earnings. There are three main methods to calculate the cost of equity:

i. Dividend model

ii. Earnings model

iii. Capital Asset Pricing Model (CAPM)

i. Dividend Model -- According to the Dividend model the cost of equity is computed based on the dividend plus expected dividend growth rate. The formula to calculate cost of equity under this method is---

Eq(2.1) $E_c = \frac{\text{Dividend}}{\text{Market Price}} + \text{Growth}$

The rate of growth in the dividend is based on the dividend paid by the company in past years. This method can be implemented in the companies generating certain stream of dividend.

ii. Earnings Model -- As per the Earnings model, the formula to measure cost is

Eq(2.2) $E_c = \frac{\text{Earnings per share}}{\text{Market Price}}$

This model assumes that the earnings are considered to grow at a constant rate and the market price per share is influenced only by the variations in earnings of the firm.

iii. Capital Asset Pricing Model (CAPM) is a tool to estimate the cost of equity. It helps investors understand how security prices behave and assess the impact of potential investments on their portfolio's risk and return. Essentially, CAPM illustrates the trade-off between risk and expected return for securities. The formula to compute cost of equity under this method is---

Eq(2.3) $E_c = F_r + \beta(M_r - F_r)$

Where, F_r = Risk free return on the investment

M_r = Required rate of return on the investment portfolio

and β = It is a measure of risk on the investment.

The current study considers CAPM method as the most appropriate method to compute the cost of equity as the other methods have certain limitation in term of data related to dividend and growth and in absence of which the cost of equity computation will not be correctly possible.

2.5.2. Cost of Preference Share capital

The amount of dividend payable to preference shareholders is considered as cost of preference share capital. The formula to compute cost of preference share capital is —

Eq(2.4) $$P_s = \frac{D}{PS}$$

where, P_s = Cost of preference share capital

D = Dividend payable to preference shareholders

PS= Preference Share Capital

The estimation of preference share capital in the present study will be undertaken as per the information available related to preference share capital.

2.5.3. Cost of Debentures and Long-term loans

The cost of debentures is the minimum return needed to keep a company's wealth unchanged. This rate is the interest agreed upon for the debentures. Calculating this cost is straightforward since the borrowing interest rate is known. The explicit cost of debt is the discount rate that matches the debt's net proceeds with the present value of interest and principal payments, adjusted for tax effects. Since the interest charges are tax deductible, the after-tax cost of debenture is calculated as follows—

Eq(2.5) $$D_c = D\,(1-t)$$

where, D_c = Cost of debt

D = Before tax cost of debt

t = tax

2.5.4. Weighted Average Cost of Capital

The Weighted Average Cost of Capital (WACC), also called the overall or composite cost of capital, is calculated by combining the specific costs of different funding sources. It represents the average cost of capital, weighted by the proportion of each source in the capital structure.

The Weighted Average Cost of Capital (WACC) is calculated as follows:

1. Determine the cost of each funding source: equity, preference shares, and debt.
2. Multiply the cost of each source by its proportion in the total capital.
3. Sum these weighted costs to get the WACC.

Weights can be based on book value or market value. Book value weights are calculated by dividing the book value of each capital source by the total book value of all sources. Market value weights are calculated similarly but use market values instead. Market value weights are more accurate as they reflect current costs and shareholder expectations, but they can introduce bias due to market fluctuations. Book value weights are easier to determine and control, making them popular among investors and policymakers. Thus, this study uses Book value weights to compute weighted average cost of capital.

2.6. Conceptual Framework

This chapter presents the review of literature covering various related aspects impacting the cost of capital and capital structure of the firm.

The conceptual framework of this study is centered on comprehending how various factors influence the cost of capital, and the capital structure of companies listed in the Nifty index. The primary objective of the study is to analyse the interplay between these factors and their consequent impact on a company's capital structure and decision-making processes. The study aims to achieve several specific objectives, which are tested through carefully formulated hypotheses. These objectives aim to understand the pattern of cost of capital and capital structure of the Indian companies under Nifty index, identifying the key determinants of capital structure within Nifty index companies and evaluating the impact of these determinants on corporate financial decision-making. A strategy is developed to accomplish these objectives. This strategy involves a thorough examination of established capital structure theories, such as the Modigliani-Miller theorem, Trade-Off Theory, Pecking Order Theory, and Agency Theory. Additionally, the study delves into various determinants of capital

structure identified through an extensive review of past literature. These determinants may include factors like tangibility, liquidity, profitability, firm size, non-debt tax shields (NDTS), and WACC. The detailed conceptual framework, as depicted in Figure 2.7, outlines the study's methodology and the flow of analysis. The framework illustrates how different theories, hypotheses, variables, and concepts are interlinked, forming a cohesive structure for the research.

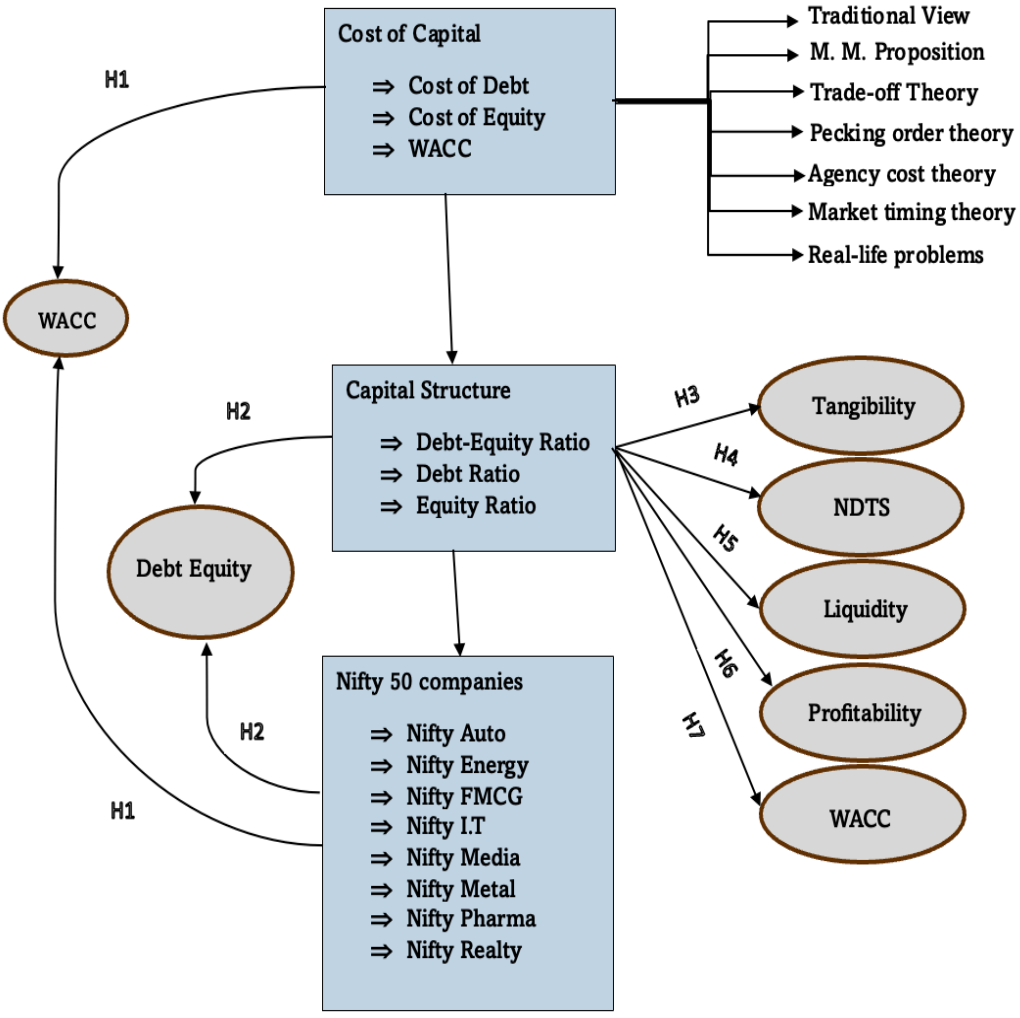

Figure 2.7 Conceptual Framework of the study

Source: Author's own contribution

This section reviews the literature on capital structure and cost of capital, highlighting the key findings from prevalent capital structure theories. Two primary theories—Pecking Order Theory and Trade-Off Theory—are central to this study. These theories are the main frameworks in the literature for explaining capital structure. The Modigliani-Miller capital structure Irrelevance Theory is another significant determinant, although it offers results that are not indicative of systematic findings. Other theories provide logical explanations for the determinants of capital structure but do not fully align with the present study. Therefore, these supplementary theories are briefly discussed to inform other relevant decisions regarding capital structure. This section also highlights deviations from the primary theories, namely Trade-Off Theory and Pecking Order Theory. It is noted that some theories are challenging to validate due to issues like human decision-making and psychology, as seen in theories such as Market Timing Theory, Agency Costs of Leverage, and Agency Cost Theory. This body of theories enhances understanding when analysing specific data sets for firms. The section also includes empirical studies on the subject, presenting their findings and implications. Finally, it summarizes the chapter with a review of the cost of capital and its estimation methods.

CHAPTER 3

RESEARCH METHODOLOGY

3.1. Research Strategy

This chapter gives details on methodology used to achieve the research objectives of this study, where the capital structures, cost of capital of the companies and the factors affecting them are evaluated. The research utilized secondary data that helped in finding an answer to the research questions. The issue concerning the quantitative research is associated with positivism as the philosophical use and quantifying of values, as well as the statistical assessment of financial data. The secondary data is obtained from the authoritative online databank CMIE Prowess, Ace Equity, along with other sources like industrial reports and the financial reports of respective companies. These data shall be tested for statistical inference based on both regression analysis and correlation analysis to provide the results of the present study on the status of the relationship between the variables under consideration.

The method used to gather data is noble in minimizing the biases and validity of the results obtained. The secondary data is sourced from different sources to ensure validity and consistency across various surveys. The attempt was also made to gather information through primary data collection technique through survey questionnaire, but the responses received were not sufficient for the analysis. The reason for the low response was the unavailability and unwillingness of the managers and policy makers in the organization to participate in the survey. In this chapter, a clear roadmap of the research methodology, identifying the procedures and tried and tested methods of data collection analysis and interpretation is presented.

3.2. Research Design

To enhance the clarity of this methodology, this research section is presented based on the research onion created by (Saunders et al., 2019) to guide researchers in systematically designing their research.

3.2.1. Research Approach

Quantitative data collection is pre-dominantly undertaken using the deductive approach. This approach has logical reasoning which works with general or wide theories or hypothesis and narrows them down on certain observations to prove the hypothesized (Snyder, 2019). More specifically, it is a variable-centered and variable-oriented approach as it deals with testing hypotheses by employing empirical data which is aimed at establishing the relationship between different independent and dependent variables (West et al., 2012).

3.2.2. Research Objectives

The study's research objectives are to provide a comprehensive analysis of capital structure, cost of capital and associations between all these factors and a deeper understanding of their interplay and impact. The capital structure and cost of capital study is tested with an aim to understand the pattern of their capital structure and cost of capital, prevailing industry wise. It also explores the relation between cost of capital and capital structure. It has been observed from the study of previous literatures that there are various determinants of capital structure. This study will analyse the identified variables namely tangibility, NDTS, liquidity, profitability and cost of capital and their impact on the capital structure. Specifically, the study focuses on the following objectives:

i. To analyse the Capital Structure of the Indian companies.
ii. To analyse Weighted Average Cost of Capital (WACC) of the Indian companies.
iii. To investigate the relationship between Cost of Capital and Capital Structure of the Indian companies.

3.2.3. Research Hypothesis:

The review of literature has provided the adequate foundation to develop the hypotheses to achieve the objectives of the study. The insights drawn from (Modigliani-Miller,1958) foundational theory posit that in a perfect market without taxes, bankruptcy costs, or asymmetric information, a firm's value is unaffected by its capital structure. However, in real-world scenarios, these factors influence the cost of capital. Trade-off theory suggests that firms balance the tax benefits of debt against the costs of financial distress to determine their optimal capital structure, thus minimizing the overall cost of capital. Pecking order theory indicates that firms prefer internal financing first, followed by debt, and then equity, due to the differing costs and control implications associated with each type of financing and the Agency theory examines the conflicts between managers and shareholders, which can impact capital structure decisions and, consequently, the cost of capital. It is known that the cost of debt includes interest payments, which are tax-deductible, thus lowering the effective cost of debt. Studies suggest that firms with higher leverage enjoy tax benefits but face increased financial distress costs. Cost of equity on the other hand represents the return required by equity investors and it has been observed that higher leverage can increase the risk and required return for equity holders, thus influencing the overall cost of capital. Weighted Average Cost of Capital (WACC) is used to evaluate investment projects, WACC is influenced by the proportion of debt and equity in a firm's capital structure. There is a significant relationship between capital structure (debt-equity ratio) and the cost of capital (WACC) of the companies. Interest payments on debt are tax-deductible, which can make debt financing more attractive for firms with higher taxable income. This tax shield can reduce the overall cost of capital for firms with higher debt-equity ratios. There is a significant difference between the capital structure and between the weighted average cost of capital (WACC) of the companies. The WACC is influenced by the firm's capital structure. A higher debt-equity ratio can lower the WACC due to the tax benefits of debt, but it can also increase financial risk, potentially raising the cost of equity.

There is a significant relation between tangibility and debt equity ratio. Firms with higher levels of tangible assets (like property, plant, and equipment) tend to have

higher debt-equity ratios. Tangible assets can be used as collateral, making it easier for firms to secure debt financing. There is a significant relation between liquidity and debt equity ratio. Firms with higher liquidity (i.e., more current assets relative to current liabilities) can manage higher debt levels more effectively. This is because they have more assets that can be quickly converted to cash to meet debt obligations. There is a significant relation between profitability and debt-equity ratio. Profitable firms often have lower debt-equity ratios because they can finance their operations through retained earnings rather than taking on debt. However, some profitable firms may use debt strategically to leverage their returns. More profitable firms may rely less on external financing, thus affecting the debt-equity ratio of the firm.

This foundation provides a comprehensive approach to exploring the relationship between cost of capital and capital structure. Based on the theoretical background and empirical evidence, the following hypotheses are formulated:

i. Research Hypothesis1: There is no statistically significant difference between capital structure of the Indian companies.
ii. Research Hypothesis2: There is no statistically significant difference between cost of capital of the Indian companies.
iii. Research Hypothesis3: There is no statistically significant relationship between tangibility and debt-equity ratio of the Indian companies.
iv. Research Hypothesis4: There is no statistically significant relationship between tax rate and debt-equity ratio of the Indian companies.
v. Research Hypothesis5: There is no statistically significant relationship between liquidity and debt-equity ratio of the Indian companies.
vi. Research Hypothesis6: There is no statistically significant relationship between profitability and debt-equity ratio of the Indian companies.
vii. Research Hypothesis7: There is no statistically significant relationship between cost of capital and debt equity ratio of the Indian companies.

3.2.4. Time Horizons

The study employs a time series data analysis, which entails collecting data for a specific period (Ørngreen & Levinsen, 2017). The data is collected for the period of 2010-2024. This long duration captures the effects of various economic cycles, market conditions, and regulatory changes on the capital structure decisions of firms. Since the study is based on a longer period, it is easier to recruit many samples and thereby offer a robust and generalisable study sample.

3.3. Data Collection

3.3.1. Secondary Data

Secondary data refer to data that has been previously collected and is readily available from other sources. For analysing NIFTY index companies, secondary data is typically sourced from:

Key sources of secondary data include:

i. Financial Statements: Companies' annual reports and financial statements contain various financial ratios, information on companies and comparative data, including debt and equity and the various determinants of capital structure. Information readily available on the Web includes public documents such as annual reports, 10-K and 10-Q, and other legal financial reports, including levels of indebtedness, equity structure, and management share ownership. These documents are essential in providing a platform for capturing quantitative data for the study.

ii. Industry Reports: Business publications of industry analysts and other research businesses offer valuable information regarding industry trends, standard practices, and industry averages and norms related to financial performance. These reports assist in explaining data within specific industries by creating given data frames. Primary data sources such as general market research firms,

industry specialists, and major market promoters such as IBISWorld, MarketLine, and Euromonitor International also provide certain details about industry trends, metrics, and other economic forces that prevail in the industry.

iii. Database: The latest and most accurate quantitative information is obtained from reputable financial database CMIE Prowess, Ace Equity, NSE India and NIFTY website. This online database contains a lot of financial information, such as share capital, long term borrowings, and other financial data, such as past performances.

Utilizing these sources of secondary data helps in conducting a thorough and comprehensive analysis of the NIFTY index companies, aiding in better investment decisions and strategic planning.

3.4. Sampling Method

The secondary data sampling method is used in this study to ensure that the data collected is relevant and reliable. This subtopic describes the approach to Secondary data sampling.

3.4.1. Secondary Data Sampling

Sampling Criteria: The 143 companies listed on the NIFTY index given under 11 sectors were primarily selected to extract data for analysis. The sector considered for the study were NIFTY Auto, Energy, Financial Services, FMCG, IT, Media, Metal, Pharmaceuticals, PSU Bank, Private Bank and Real Estate. Later it was ascertained that many companies were delisted from NIFTY Index and data for some companies for certain years was missing such as, Adani transmission under NIFTY energy has data available till the year 2018 only. It was also decided to exclude NIFTY PSU Bank, Private bank and Financial Services from the study in order to maintain the uniformity in the sample as the financial sector involves businesses like banks, insurance companies, and investment firms that deal primarily with financial transactions, asset management, and risk assessment while the other sectors engage in manufacturing,

services, or goods production, which involves tangible products and different operational risks. Thus, in the presence of certain constraints the complete information of 85 companies were attained uniformly comprising of eight sectors under NIFTY. Hence the revised list of the companies included for this study are 85 that includes 14 for auto, 9 for energy, 13 for FMCG, 6 for IT, 11 for media, 14 for metal, 9 for pharma, and 9 for real estate industries.

3.5. Research Variables

In this section, the key research variables used in the study and their respective links to both secondary data sources are detailed. The variables were identified from the review of literature which was categorized based on the research objectives. They are essential for understanding the impact of capital structure on the cost of capital.

3.5.1. Capital Structure Variables

i. To determine/estimate the capital structure:

- Debt Ratio: Total Debt / Total Assets
- Equity Ratio: Total share capital / Total Assets
- Debt-to-Equity Ratio: Total Debt / Total Equity
- Determinants of Capital Structure:
  - Tangibility: Fixed Assets / Total Assets
  - Non-Debt Tax Shield: Depreciation / Total Assets
  - Liquidity: Current Assets / Current Liabilities
  - Profitability: EBIT / Total Assets
  - Cost of capital: Cost of debt + Cost of equity

3.5.2. Cost of Capital Variables

i. To determine cost of capital:

- Cost of Debt (D_c): Interest Expense(1-Tax) / Net Proceeds of debentures
- Cost of Equity (E_c): Calculated using CAPM Method
- Cost of Equity using CAPM: Risk free rate + β (Equity risk premium)

- Weighted Average Cost of Capital (WACC): $(W_1 * E_c) + (W_2 * D_c)$
- Tax Rate: Corporate Tax Rate applicable or Total tax expenses/Profit/loss before tax* 100

3.6. Data Analysis

This section provides and explains how the data used in the study is analyzed. Using the following techniques would help ensure the unification of knowledge and get an overall view of the research objectives.

3.6.1. Quantitative Analysis:

Quantitative data is analyzed using statistical software tools to arrive at conclusions that can be understood by the end users. The analysis of data has been conducted under correlation tables and multiple regression statistical methods to ascertain the significant impact of variables on the capital structure. There are certain assumptions which are tested prior to running the multiple regression through which data must be tested namely normality, homoscedasticity and multicollinearity. The normality test is applied to ascertain that the data used for the analysis represents the normal distributed population. Kolmogorov Smirnov(K-S) test, Shapiro Wilk Test, Anderson- Darling test are undertaken by the researchers depending upon the data size to check the normality. In this study the K-S test is used as the data size is more than to check the normal distribution. The homoscedastic assumption that dependent variables are homoscedastic, and multicollinearity is tested to know inter association between independent variables. The variables are investigated based on two of the most prevalent capital structure theories, trade-off theory and pecking order theory, to determine whether the variables act in a similar manner or not. Sub-sheets were prepared for different categories of data, including capital structure constituents, components of cost of capital, and various determinants of capital structure (Mishra & Alok, 2011).

i. Descriptive Statistics: As the name suggests, descriptive statistics give details about the data collected by presenting the data in terms of its means, variation, and the graphical presentation of the data set. Key measures include:

ii. Mean: The behaviour of the data over the range of values; in other words, the quantity is often referred to as the average of the data.

iii. Median: The value that divides the dataset into two halves with an equal number of records or more extensive records in the higher half or smaller records in the lower half of the dataset.

iv. Standard Deviation: Identifies the variability or spread of the data gathered depending on the range, mean deviation, or standard deviation (Kumar, 2011).

v. Normality test: A normality test determines whether sample data has been drawn from a normally distributed population. The Kolmogorov-Smirnov (K-S) normality test is used to examine the normal distribution of the variables.

The hypothesis in normality testing is as follows:

H_0: The data follows a normal distribution.

H_1: The data does not follow a normal distribution.

vi. Multicollinearity: Multicollinearity refers to a situation in regression analysis where predictor variables are highly correlated with each other. When predictors exhibit high intercorrelation, they provide redundant information, which can lead to unstable and unreliable estimates of regression coefficients. This redundancy makes the predictors less independent, causing small changes in the data to result in large fluctuations in the coefficients. Multicollinearity can undermine the validity of hypothesis tests, confidence intervals, and predictions. It can be identified by evaluating the variance inflation factor (VIF) or analysing the correlation matrix among predictors. To mitigate multicollinearity, one can either exclude one of the highly correlated predictors or combine them into a single composite variable. The VIF measures the extent to which the variance of a regression coefficient is inflated due to multicollinearity. A VIF less than 1 and 1 indicates no multicollinearity, whereas values between 1 and 5 suggests moderate multicollinearity, VIF>5 indicates high degree of correlation among predictors. VIF>10 signals serious multicollinearity.

Eq(3.1) $VIF = 1/(1-R_t^2) = 1/\text{ tolerance}$

Where, VIF = Variance Inflation factor

R_t^2 = The unadjusted R-squared value for the regression involving the t-th independent variable, which is inversely related to the Variance Inflation Factor (VIF) used to measure the level of multicollinearity among predictor variables.

The Durbin-Watson statistic is a tool used to identify autocorrelation in the residuals of a regression model. Autocorrelation happens when residuals are correlated rather than being independently distributed. This correlation can make the regression coefficients inefficient, potentially leading to inaccurate hypothesis tests and confidence intervals. The Durbin-Watson statistic ranges in value from 0 to 4. A value near 2 indicates non-autocorrelation; a value toward 0 indicates positive autocorrelation; a value toward 4 indicates negative autocorrelation. A statistic near 2 implies that the residuals are independently distributed, indicating a well-specified model. Conversely, a statistic far from 2 may indicate autocorrelation, suggesting that the model might need adjustments. The Durbin-Watson test uses the following hypotheses:

H0(null hypothesis): There is no correlation among the residuals.

H1 (alternative hypothesis): The residuals are autocorrelated.

vii. Homoscedasticity or homogeneity of variances is tested which is an assumption of equal or similar variances in different groups being compared.

The prerequisites for linear regression analysis, namely normality test, multicollinearity test are primarily considered before applying multiple linear regression.

viii. Regression Analysis: The regression analysis test facilitates hypothesis testing and identifies the correlation between the dependent and the independent variables. Multiple Regression Analysis is used to test the effects of one or more than one independent variable on one dependent variable, for example, the impact of the independent variables, liquidity of the firm, and profitability, on the dependent variable, which is the Debt-equity ratio of the firm.

Regression Model

To test the hypotheses, we will use a multiple regression model. The regression equation is as follows:

Eq(3.2) $D/E=\beta0 + \beta1TANG + \beta2TAX + \beta3LIQ + \beta4PROF + \beta5WACC + \epsilon$

Where:

- D/E = Debt-Equity Ratio
- β0 = Intercept
- β1,β2,β3,β4,β5 = Coefficients of independent variables
- ϵ = Error term

ix. Correlation Analysis: Correlation analysis measures the degree of a linear relationship and the direction between two variables on the interval level. The correlation coefficient (r) indicates the degree of relationship, where:
+ 1 depicts a scenario of complete positive correlation.
-Whereby is one assigned to reflect the perfect negative relationship between the two variables being tested while 0 reflects complete independence.
0 indicates no correlation (Panneerselvam, 2014).

x. Data Visualization: Quantitative data is presented in the form of graphs, charts, and tables, which help give a graphical representation of the data and help analyze and communicate. There are several data visualization methods, and the most used charts are histograms, scatter plot charts, bar charts, and line charts.

xi. Data Interpretation: The overall implications of all the research findings are discussed, as well as the formulated research objectives and the theoretical background. However, the analysis outlined the conclusions regarding the main research questions on the relationship between capital structure and cost of capital. Finally, this understanding of the model offers a rich source of information that may be useful in formulating prescriptive advice for practitioners and policymakers (Chawla & Sodhi, 2011). The chosen and applied methods of analysis in this research integrate numerical analysis approaches to ensure comprehensive research questions are adequately

addressed. The use of these techniques enhances the reliability and validity of the findings, thus providing a broader and richer understanding of the effects of capital structure on several financial metrics.

3.7. Validity and Reliability

Establishing the validity and reliability of the data and analysis is one way of maintaining the study's credibility and generalisability. This section provides the measures adopted in the research while conducting secondary data collection, analysis, and synthesis. Secondary data has the added advantage of being easily accessible and available in abundance(Molwus et al., 2013); however, the validity and reliability of secondary data are issues of concern in any research work.

3.7.1. Validity

i. Source Credibility: Secondary data is obtained from international financial databases, such as books and journals, Bloomberg, and Thomson Reuters. These sources are highly acknowledged for the credibility of the information and data they provide within the financial sector.

ii. Cross-Verification: Verification is done across the various data sources to eliminate inconsistency and ensure accuracy. For example, when data from the Bloomberg terminal is entered, consistency checks are made against the entry from the firm's financial statements or other databases to ascertain the variation in the numbers (Iacobucci, 2010).

iii. Up-to-date Information: Only the latest financial information is used to assess the current condition of the businesses discussed and sectors when analysing the results. Historical data usage is highlighted to analyze the trends and patterns prevalent through time.

3.7.2. Reliability

i. Standardized Measures: The analysis applies systematic financial productivity measures and ratios (such as the ratio of the debt/equity and return on capital, assets or equity). This general structure means that the data is compared across numerous companies and industries.

ii. Reputable Databases: First, insightful analysis is sourced from established financial databases since the information has been analyzed and compiled strictly following best practices. Many of these databases have well-developed systems aimed at data acquisition and authentication, which adds to the credibility of the data applied.

3. 8. Ethical Considerations

The principle of ethical consideration refers to the standards that should be maintained while conducting research responsibly and about all concerned individuals. This section underscores the measures taken to adhere to ethical standards in the study, with emphasis on issues related to confidentiality, informed consent, and citations.

i. Data Protection: All data stored electronically is encrypted to minimize the chances of data theft. Encryption also helps greatly in that even if the data is intercepted or accessed by an unauthorized person, it will remain in a format that cannot be compromised. The various measures that have been put in place to buffer data are usually audited periodically to ensure that they conform to set data security measures and to check for any other lapses that may have occurred.

ii. Academic Integrity: The following guidelines are crucial in promoting academic integrity and intellectual honesty, and that is why proper citations are essential. Sources used for any form of secondary data, such as financial databases, industry reports, or writers, are greatly cited to show gratitude to the

original authors. The analysis adheres to proper citation styles, which are requisite in academic work to facilitate verification and objectivity in source citation.

iii. Avoiding Plagiarism: Academic misconduct involves plagiarizing, which is done by properly referencing ideas from the work of other authors, quotes, or sources. The researcher observed strict compliance with the principles of citation to avoid any incidences of plagiarism. In addition, the final compiled document is scanned using plagiarism checkers to confirm beyond doubt whether the work contained in the document was authored by someone else and not the candidate.

iv. Crediting Contributions: The assignment of credit for the work conducted and the role of collaborators, advisors or participants is clear. This involves acknowledging the survey participants and anyone who assisted in the survey and data gathering and processing procedures. The acknowledgments usually placed at the end of the final report regard specific people who played a role in the study, proving that the research was a team project.

v. Transparency in Data Sources: In this research, references are given in detail to all the secondary literature sources, including specific financial database types and publications used in the study. This aspect enhances the reliability of the research since other individuals can confirm the findings and proceed with the research outcomes. They state the procedures and methodologies clearly and use the details to present an accurate picture of the strengths and weaknesses of the data they used. In conclusion, ethical considerations are central to the conduct of this study for their appropriateness and relevance in ensuring that the survey is conducted correctly and treating all participants with the respect they deserve. Ensuring participants' anonymity, gaining their permission to participate in the study, and using proper citations also followed the ethical guidelines that would safeguard the well-being of the participants and increase the study's credibility and reliability.

CHAPTER 4

EMPIRICAL ANALYSIS OF COST OF CAPITAL AND CAPITAL STRUCTURE

The empirical analysis aims to systematically investigate the cost of capital and capital structure of the companies under NIFTY sectors and the key determinants of capital structure among firms listed on the Nifty 50 index. By employing comprehensive regression models, we analyse the influence of tangibility, taxability, liquidity, profitability, and cost of capital on the debt-equity ratio.

In this section, we delve into the empirical examination of the pattern of cost of capital and capital structure to understand the variations prevailing industry wise and factors impacting the capital structure of the companies. Through rigorous statistical techniques, we aim to uncover the relationships between capital structure and various financial metrics such as asset tangibility, tax benefits, liquidity ratios, profitability measures, and the weighted average cost of capital. The analysis vividly explores every element involved in the analysis by utilising a robust dataset spanning 14 years.

4.1. Analysis of cost of capital

The cost of capital analysis highlights the weighted average cost of capital (WACC) values for the selected sectors, showcasing variations across different sectors and further revealing intra-sector differences spread across individual companies. The cost of capital is determined by summing the cost of equity and the cost of debt. Cost of Equity is calculated using the Capital Asset Pricing Model (CAPM), which requires the risk-free return, beta, and equity risk premium. The risk-free return, representing the return on a theoretically risk-free investment, is derived from the 10-year government bond yield rate set by the Reserve Bank of India (RBI)[2]. The equity risk

2. https://www.rbi.org.in/

premium, the additional return investors expect for investing in stocks compared to a risk-free asset, is the difference between the market return and the risk-free return, referenced from Moody's[3]. Beta measures a security's volatility relative to the overall market, indicating how much a stock price will move in relation to market fluctuations. This value varies by industry and is sourced from the National Stock Exchange (NSE) of India. Cost of Debt involves the interest rate charged on long-term borrowings and the applicable tax rate, obtainable from the financial statements of the industries. Once the costs of equity and debt are calculated, the cost of capital is derived by summing these values. The WACC incorporates the costs of different sources according to their proportional contributions, representing the cost of capital for the companies in this study. The objective is to understand the variations in WACC among Indian companies selected for the study. Table 4.1 illustrates the WACC for each sector. The findings indicate that the Realty sector has the highest WACC, significantly exceeding the overall industry average, while the Energy sector has the lowest WACC. The WACC for the Auto, Energy, and FMCG industries is below the overall average. Thus, there is a consistent pattern in WACC across most industries, except for the Realty industry, which shows a notable increase compared to its overall average.

3. https://www.moodys.com/

Table 4.1 Weighted Average Cost of capital of all the Industries

S. No.	Industries	No. of companies	WACC in percentage
1	NIFTY AUTO	14	10.02%
2	NIFTY ENERGY	9	9.64%
3	NIFTY FMCG	13	13.36%
4	NIFTY IT	6	13.56%
5	NIFTY MEDIA	11	15.78%
6	NIFTY METAL	14	14.24%
7	NIFTY PHARMA	9	15.27%
8	NIFTY REALTY	9	21.90%
	Total	85	

Average: 13.54

Source: Author's own contribution

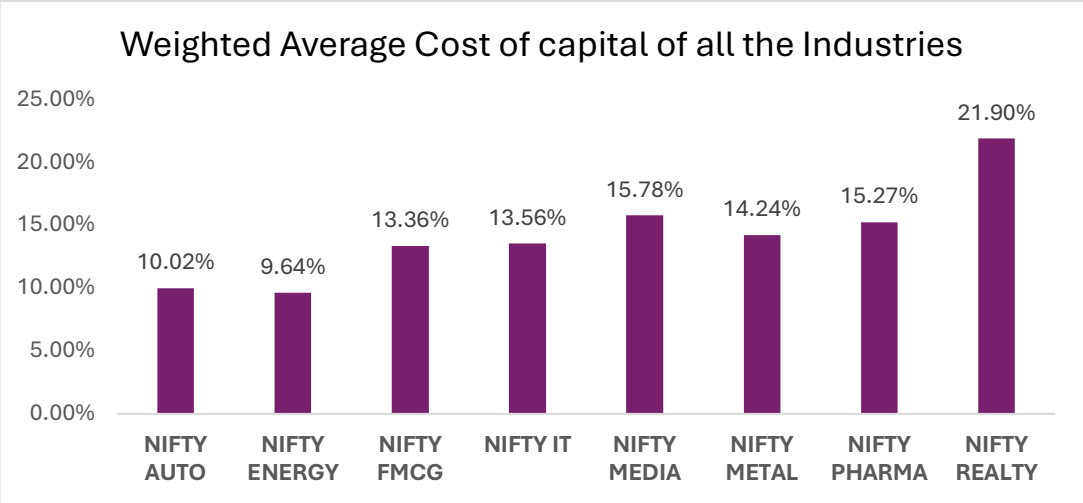

Figure 4.1 Weighted Average Cost of capital of all the Industries

Source: Author's own contribution

It has been inferred from Table 4.1 that the Average WACC is 13.54. NIFTY Realty comprising of 9 companies' records the highest weighted average cost of capital as

21.90% and Nifty Energy with 9 companies has the lowest weighted average cost of capital as 9.64% as shown in Figure 4.1. Thus, it has been noted that WACC ranges from 9.64% to 21.90% among the 8 industries. Five industries, namely, Metal, Media, Pharma, IT and Realty industries have the WACC substantially higher than its overall average. The IT Industry has the weighted average cost of capital approximately equal to the average mean. Energy and Automobile industries indicate weighted average cost of capital lower than the average mean. The high weighted average cost of capital may be due to the large portion of funds obtained from equity source. A high Weighted Average Cost of Capital (WACC) can be attributed to several factors across different industries.

The industry wise analysis of cost of capital is done separately as follows.

4.2. Weighted Average Cost of Capital - Industry-wise Analysis

In this section, the 14-year weighted average cost of capital for the sample units of 8 sectors namely Auto, Energy, FMCG, Metal, Media, Pharma, IT and Realty under NIFTY50 index is shown. It consolidates the findings for each sector showing the variation in WACC company wise within the sector.

4.2.1. Weighted Average Cost of capital of NIFTY AUTO Industry

India's automotive industry ranked as the fourth largest globally in terms of production and valuation with a valuation of over $100 billion as per the IBEF[4] reports, contributing significantly to the nation's GDP and exports, is a key player in the global market. By 2023, it emerged as the third-largest automobile market worldwide based on sales figures marking the testament of its dynamism and potential.

The WACC of all the companies in Nifty Auto is expressed in Table 4.2. The 14 years average of the sample units is 10.02 percent. The Amara Raja Batteries Limited has the highest weighted average cost of capital while the Bajaj Auto Limited has the lowest percentage of the same. Seven companies namely, Tata Motors, MRF Limited,

4. India Brand Equity Foundation ibef.org

Maruti Suzuki India Ltd, Amara Raja Batteries, Apollo Tyres ltd, Ashok Leyland and Exide industries Limited have the WACC substantially larger than its overall average. There are seven units which have the weighted average cost of capital far less than the overall average of 10.02 percent. Among them, Bajaj Auto Ltd and Hero MotoCorp have the lowest weighted average cost of capital hovering around 4.35 percent. The WACC of majority companies in AUTO industry is near to its overall average or lesser except for Amara Raja Batteries Limited which has a WACC of 17.66 percent which is far higher than its overall average. The automotive industry requires significant investments in research and development, manufacturing facilities, and technology upgrades. Fluctuations in demand, changes in consumer preferences, and the financing choice can increase the perceived risk, leading to higher costs of capital. The findings will be further validated from the capital structure perspective also. Among those six units Bharat Forge Limited, Bosch Limited, Mahindra & Mahindra Limited and Hero Motocorp Limited reveals the major reliance on borrowed funds in capital structure composition. Thus, showing the impact of debt usage on the WACC.

Table 4.2 Weighted Average Cost of capital of the companies under NIFTY AUTO

Sr.no	Companies	WACC in percentage
1	Amara Raja Batteries Limited	17.66%
2	Apollo Tyres Limited	13.39%
3	Ashok Leyland Limited	11.28%
4	Bajaj Auto Limited	4.35%
5	Bharat Forge Limited	7.35%
6	Bosch Limited	5.67%
7	Eicher Motors Limited	8.47%
8	Exide Industries Limited	10.73%
9	Hero MotoCorp Limited	4.48%
10	Mahindra & Mahindra Limited	5.79%

11	Maruti Suzuki India Limited	12.14%
12	MRF Limited	16.83%
13	Tata Motors Limited	13.90%
14	TVS Motor Company Limited	8.18%

Average: 10.02

Source: Author's own contribution

4.2.2. Weighted Average Cost of capital of NIFTY ENERGY Industry

India ranks as the third largest energy producer globally. As per the *statistical review of world energy report 2021*[5], the country generated a total of 1,949 TWh of electricity, with utilities contributing 1,734 TWh during the fiscal year 2023–24. In FY2015, agricultural energy consumption in India was the highest worldwide at 17.89%. The nation possesses substantial potential in solar, wind, hydro (including pumped storage), and biomass energy. Additionally, as of January 2011, India had approximately 38 trillion cubic feet of proven natural gas reserves, making it the 26th largest reserve globally.

The analysis conducted to understand the WACC of the Energy sector reveals that the 14 years average of the sample units is 9.64 percent. The WACC of all the companies in Nifty Energy is expressed in Table 4.3. The Oil & Natural Gas Corporation Limited has the highest weighted average cost of capital while the Power Grid Corporation of India Limited has the lowest percentage of the same. The WACC of the companies in this sector is near to its overall average except for the companies namely Bharat Petroleum Corporation Limited, Indian Oil Corporation Limited and Oil & Natural Gas Corporation Limited. There are five units which have the weighted average cost of capital far less than the overall average of 9.64 percent. Among them NTPC Limited, and Power Grid Corporation of India Limited have the lowest weighted average cost of capital hovering around 4.31 percent. It has been noticed that Energy sector is more debt driven. Among those five units NTPC Limited, Hindustan Petroleum Corporation Limited, Power Grid Corporation of India Limited and

5. https://www.energyinst.org/statistical-review

Reliance Industries Limited reveals the major reliance on borrowed funds in capital structure composition. Energy companies often require substantial investments in infrastructure and technology. The cost of equity financing is significantly higher than the cost of debt, contributing to a higher WACC.

Table 4.3 Weighted Average Cost of capital of the companies under NIFTY ENERGY

Sr.no	Companies	WACC in percentage
1	Bharat Petroleum Corporation Limited	13.81%
2	GAIL (India) Limited	8.84%
3	Hindustan Petroleum Corporation Limited	7.75%
4	Indian Oil Corporation Limited	12.31%
5	NTPC Limited	4.31%
6	Oil & Natural Gas Corporation Limited	18.28%
7	Power Grid Corporation of India Limited	5.07%
8	Reliance Industries Limited	5.22%
9	Tata Power Company Limited	11.20%

Average: 9.64

Source: Author's own contribution

4.2.3. Weighted Average Cost of capital of NIFTY FMCG Industry

The fast-moving consumer goods (FMCG) sector primarily focuses on the production, distribution, and marketing of fast-moving consumer goods. It is the fourth largest sector in the Indian economy. Within the industry, household and personal care products contribute to 50% of sales, healthcare products account for 31-32%, and the food and beverage segment makes up the remaining 18-19% as per *Indian consumer products industry report*[6]. The following is the analysis related to WACC.

6. https://www.reuters.com/world/india/

The WACC of all the companies in Nifty FMCG is expressed in Table 4.4. The 14 years average of the sample units is 13.36 percent. The Nestle India Limited has the highest weighted average cost of capital while the Hindustan Unilever Limited has the lowest percentage of the same. Five companies namely Britannia Industries Limited, Godrej Industries Limited, Nestle India Limited, United Breweries Limited and United Spirits Limited have the WACC substantially larger than its overall average. There are eight units which have the weighted average cost of capital far less than the overall average of 13.36 percent. Hindustan Unilever ltd having least WACC is 100% equity funded while the Godrej Industries limited is prominently funded from long term borrowings has 22.16% WACC. The FMCG sector is highly competitive, with numerous players vying for market share. This competition can lead to higher costs as companies invest in innovation, advertising, and promotions to differentiate their products.

Table 4.4 Weighted Average Cost of capital of the companies under NIFTY FMCG

Sr.no	Companies	WACC in percentage
1	Britannia Industries Limited	18.48%
2	Colgate Palmolive (India) Limited	4.32%
3	Dabur India Limited	5.66%
4	Emami Limited	10.16%
5	Godrej Consumer Products Limited	5.57%
6	Godrej Industries Limited	22.16%
7	Hindustan Unilever Limited	2.02%
8	ITC Limited	9.37%
9	Jubilant Foodworks Limited	8.02%
10	Nestle India Limited	47.29%
11	Tata Global Beverages Limited	5.48%
12	United Breweries Limited	16.21%
13	United Spirits Limited	18.97%

Average: 13.36

Source: Author's own contribution

4.2.4. Weighted Average Cost of capital of NIFTY IT Industry

India's information technology (IT) industry includes both IT services and business process outsourcing (BPO). In FY 2022, the IT-BPM sector contributed 7.4% to India's GDP. The top three Indian IT companies, TCS, Wipro, and Infosys, are major employers, offering numerous job opportunities due to the increasing demand for talent. Indian IT firms have delivery centres worldwide, providing services across various verticals such as BFSI (Banking, Financial Services, and Insurance), telecom, and retail. The industry is at the forefront of digital transformation, with a focus on innovative digital applications and strategic alliances. The Indian government has implemented policies to support the IT sector, including significant budget allocations for IT and telecom. Table 4.5 gives the WACC analysis of this sector.

The WACC of all the companies in Nifty IT is expressed in Table 4.5. The 14 years average of the sample units is 13.56 percent. The Wipro Limited has the highest weighted average cost of capital while Tata Elxsi Limited has the lowest percentage of the same. The Tata Elxsi Limited and Infosys Limited is financed 100% through equity capital having the WACC lower than the overall average while Wipro limited is significantly financed through borrowings having highest WACC than the average. The IT sector is subject to various regulations related to data privacy, cybersecurity, and intellectual property. Compliance with these regulations can increase operational costs and, consequently, the WACC.

Table 4.5 Weighted Average Cost of capital of the companies under NIFTY IT

Sr.no	Companies	WACC in percentage
1	HCL Technologies Limited	18.85%
2	Infosys Limited	6.63%
3	Tata Consultancy Services Limited	9.52%
4	Tata Elxsi Limited	4.91%

5	Tech Mahindra Limited	12.90%
6	Wipro Limited	28.55%

Average: 13.56

Source: Author's own contribution

4.2.5. Weighted Average Cost of capital of NIFTY MEDIA Industry

The Indian media industry is experiencing rapid growth and transformation The industry is expected to grow at a compound annual growth rate (CAGR) of 8.3%, reaching approximately Rs 3.65 trillion (USD 19.2 billion) by 2028 as per the *media and entertainment industry report* 2023[7]. The Indian government has implemented policies to support the Media sector, including increasing the foreign direct investment (FDI) limit and auctioning spectrum to improve connectivity. With a large young population and affordable data, India is uniquely positioned to capitalize on innovations in the Media and entertainment sector. Here is the analysis of Media sector on certain dimensions.

The WACC of all the companies in Nifty Media is expressed in Table 4.6. The 14 years average of the sample units is 15.78 percent. The Zee Entertainment Enterprises Limited has the highest weighted average cost of capital while Sun TV Network Limited has the lowest percentage of the same. Six companies namely Dish TV India Limited, Network18 Media & Investments Limited, PVR Limited, Zee Entertainment Enterprises Limited and Zee Media Corporation Limited have the WACC substantially larger than its overall average. There are five units which have the weighted average cost of capital far less than the overall average of 15.78 percent. Sun TV Network Limited and Balaji Telefilms Limited is financed 100% through equity capital and having the WACC lower than the overall average while Dish TV India Limited and Jagran Prakashan Limited is significantly financed through borrowings having WACC 17.83% and 10.05% respectively close to the overall average. The media sector requires significant investments in technology, content creation, and distribution networks. This high capital expenditure can increase the overall cost of capital.

7.https://www.pwc.com/

Table 4.6 Weighted Average Cost of capital of the companies under NIFTY MEDIA

Sr.no	Companies	WACC in percentage
1	Balaji Telefilms Limited	5.77%
2	Dish TV India Limited	17.83%
3	Jagran Prakashan Limited	10.05%
4	Network18 Media & Investments Limited	18.54%
5	PVR Limited	22.22%
6	Saregama India Limited	8.12%
7	Sun TV Network Limited	4.36%
8	TV Today Network Limited	8.11%
9	TV18 Broadcast Limited	15.99%
10	Zee Entertainment Enterprises Limited	38.72%
11	Zee Media Corporation Limited	23.84%

Average: 15.78

Source: Author's own contribution

4.2.6. Weighted Average Cost of capital of NIFTY METAL Industry

The Metal sector in India is a crucial component of the country's industrial landscape. The Metal sector significantly contributes to India's GDP and industrial growth. It supports infrastructure development, manufacturing, and various end-use industries like automotive, construction, and power. India is rich in metallic minerals such as iron ore, bauxite, chromite, and manganese. The country is largely self-sufficient in these minerals, which are essential for steel production and other industrial applications. India is a major exporter of iron and steel. In FY 2022, the export value of iron and steel was approximately $17.62 billion. The sector has seen a compound annual growth rate (CAGR) of 17.15% in exports from FY 2016 to FY 2022.The growth of the metal sector is driven by rising infrastructure development, automotive production, and the demand for steel in residential and commercial building project. Here is the analysis of Metal sector on certain dimensions.

The WACC of all the companies in the Nifty Metal Industry is expressed in the Table 4.7. The 14 years average of the sample units is 14.24 percent. The APL Apollo Tubes Limited has the highest weighted average cost of capital while Hindalco Industries Limited has the lowest percentage of the same. Five companies namely APL Apollo Tubes Limited, Hindustan Copper Limited, National Aluminium Company Limited, Ratnamani Metals & Tubes Limited and Vedanta Limited have the WACC substantially larger than its overall average. There are nine units which have the weighted average cost of capital far less than the overall average of 14.24 percent. Hindalco Industries Limited and Tata Steel Limited is largely financed through long term borrowings having the lowest WACC. This industry is largely financed through borrowings excluding two companies namely MOIL Limited and National Aluminium Company Limited which is 100% financed through Equity share capital. Companies with an optimal mix of debt and equity financing can achieve a lower WACC. Debt is generally cheaper than equity due to tax benefits, so a higher proportion of debt can reduce the overall cost of capital.

Table 4.7 Weighted Average Cost of capital of of the companies under NIFTY METAL

Sr.no	Companies	WACC in percentage
1	APL Apollo Tubes Limited	35.17%
2	Coal India Limited	13.31%
3	Hindalco Industries Limited	7.39%
4	Hindustan Copper Limited	15.25%
5	Hindustan Zinc Limited	8.50%
6	Jindal Steel & Power Limited	11.28%
7	JSW Steel Limited	9.19%
8	MOIL Limited	13.35%
9	National Aluminium Company Limited	18.89%
10	Ratnamani Metals & Tubes Limited	16.15%
11	Steel Authority of India Limited	12.33%
12	Tata Steel Limited	7.45%

13	Vedanta Limited	17.42%
14	Welspun Corp Limited	13.69%

Average: 14.24

Source: Author's own contribution

4.2.7. Weighted Average Cost of capital of NIFTY PHARMA Industry

The Indian Pharmaceutical Industry has witnessed a robust growth over the past few years moving on from a turnover of approx. US $ 1 billion in 1990 to over US $30 billion in 2015 of which the export turnover is approximately US $ 15 billion. The country now ranks 3rd world-wide by volume of production and 14th by value, thereby accounting for around 10% of world's production by volume and 1.5% by value. Globally, it ranks 4th in terms of generic production and 17th in terms of export value of bulk actives and dosage forms. Indian exports are destined to more than 200 countries around the globe including highly regulated markets of US, West Europe, Japan and Australia. Here is the analysis of Pharma sector on certain dimensions.

The WACC of all the companies in the Nifty Pharma Industry is expressed in Table 4.8. The 14 years average of the sample units is 13.74 percent. The Piramal Enterprises Limited has the highest weighted average cost of capital while Divi's Laboratories Limited has the lowest percentage of the same. Five companies namely Piramal Enterprises Limited, Lupin Limited, Cipla Limited, Sun Pharmaceutical Industries Limited and Aurobindo Pharma Limited have the WACC substantially larger than its overall average. There are four units which have the weighted average cost of capital far less than the overall average of 13.74 percent. Aurobindo Pharma Limited and Sun Pharmaceutical Industries Limited is largely financed through long term borrowings having the WACC close to overall average while Piramal Enterprises Limited having highest WACC is majorly financed through long term borrowings. The pharmaceutical sector requires substantial investments in R&D to develop new drugs and therapies. These high costs can increase the overall cost of capital.

Table 4.8 Weighted Average Cost of capital of of the companies under NIFTY PHARMA

Sr.no	Companies	WACC in percentage
1	Aurobindo Pharma Limited	13.62%
2	Biocon Limited	7.64%
3	Cipla Limited	18.35%
4	Divi's Laboratories Limited	7.48%
5	Dr. Reddy's Laboratories Limited	11.80%
6	Glenmark Pharmaceuticals Limited	9.47%
7	Lupin Limited	18.52%
8	Piramal Enterprises Limited	35.84%
9	Sun Pharmaceutical Industries Limited	14.69%

Average: 13.74

Source: Author's own contribution

4.2.8. Weighted Average Cost of capital of NIFTY REALTY Industry

The real estate industry in India is a dynamic and rapidly growing sector, contributing significantly to the country's economy. The real estate market in India is expected to reach USD 1 trillion by 2030, up from USD 200 billion in 2021. The sector is projected to grow at a CAGR of 9.2% from 2023 to 2028.The industry comprises four main sub-sectors namely residential, commercial, retail, and hospitality. Each sub-sector is experiencing significant growth due to urbanization and rising demand for infrastructure. The Indian real estate sector attracts substantial foreign investment. The government has allowed 100% FDI for townships and settlement development projects. Here is the analysis of Realty sector on certain dimensions.

The WACC of all the companies in the Nifty Realty Industry is expressed in Table 4.9. The 14 years average of the sample units is 19.71 percent. The Sobha Limited has the highest weighted average cost of capital while Mahindra Lifespace Developers Limited has the lowest percentage of the same. Three companies namely Godrej Properties Limited, Prestige Estates Projects Limited and Sobha Limited have the

WACC substantially larger than its overall average. There are six units which have the weighted average cost of capital far less than the overall average of 19.71 percent. Mahindra Lifespace Developers Limited is largely financed through long term borrowings having the lowest WACC while Sobha Limited having the highest weighted average cost of capital is also majorly financed through long term borrowings. Interest payments on debt are tax-deductible, providing a financial incentive for companies to use debt financing, which can lower the overall cost of capital.

Table 4.9 Weighted Average Cost of capital of of the companies under NIFTY REALTY

Sr.no	Companies	WACC in percentage
1	Brigade Enterprises Limited	9.58%
2	DLF Limited	19.54%
3	Godrej Properties Limited	28.21%
4	Mahindra Lifespace Developers Limited	5.49%
5	Oberoi Realty Limited	8.53%
6	Prestige Estates Projects Limited	25.92%
7	Sobha Limited	74.71%
8	Sunteck Realty Limited	16.02%
9	The Phoenix Mills Limited	9.09%

Average: 19.71

Source: Author's own contribution

4.3. Analysis of Capital structure

Capital Structure' refers to long-term sources of finance, including preference share capital, debentures, long-term debts, and equity share capital, alongside reserves and surplus. It excludes short-term debts. The capital structure is composed of both owned and borrowed funds. Owned funds encompass equity share capital and free reserves and surplus, while borrowed funds consist of debentures and long-term borrowings

from various financial institutions. In the current study, the analysis of capital structure focuses on long-term sources such as Equity Share Capital and Long-term Borrowings. This is due to the lack of adequate information regarding the involvement of preference share capital and debentures in the industries' capital structures. Additionally, efforts have been made to ensure data uniformity throughout the analysis and interpretation.

Table 4.10 presents an exhaustive analysis of debt-equity ratios across various industries within the sample, shedding light on the capital structure preferences prevalent in these sectors. Notably, the Auto and Energy industries exhibit the highest debt-equity ratios, with debt comprising a substantial 91% of their capital structure. This heavy reliance on debt underscores the capital-intensive nature of these industries, which frequently depend on significant borrowing to support expansive operations and infrastructure investments.

Conversely, the Information Technology (IT) industry showcases the lowest debt-equity ratio at 27%, indicating a predominant dependence on equity financing. This lower level of debt is likely attributed to the IT sector’s asset-light business model, rapid cash flow generation, and reduced need for external funding in comparison to more capital-heavy industries. This contrast highlights the diverse financial strategies employed by companies across different sectors.

The debt-equity ratios of the sample companies range from 27% to 91%, illustrating considerable variation in capital structure decisions influenced by industry-specific factors such as operational requirements, growth strategies, and risk tolerance. For example, the Fast-Moving Consumer Goods (FMCG) and pharmaceutical industries maintain debt-equity ratios of 60:40 and 85:15, respectively, reflecting a moderate reliance on debt.

In contrast, the Metal and Realty industries display higher debt levels with ratios of 89:11 and 88:12, respectively, indicative of their dependence on substantial external funding for large-scale projects and working capital needs.

Figure 4.2. further emphasizes the predominance of debt in the capital structures of most industries. However, the IT and Media sectors stand out as notable exceptions, exhibiting relatively lower debt content in their capital structures. The IT sector’s ratio of 27:73 (debt to equity) and the Media sector’s 49:51 ratio underscores a greater

inclination toward equity financing, driven by lower capital expenditure requirements and enhanced operational agility.

This industry-specific analysis provides a nuanced understanding of how capital structures vary significantly across sectors, reflecting their unique operational dynamics, financial strategies, and risk management practices. These insights contribute to a deeper comprehension of the strategic financial decisions made by companies in different industries, illuminating broader trends influencing corporate finance in contemporary markets.

Table 4.10 Capital structure of all the industries

Sr. no	Industries	Equity Share Capital	Long Term Borrowings
1	NiFTY AUTO	9%	91%
2	NIFTY ENERGY	9%	91%
3	NIFTY FMCG	40%	60%
4	NIFTY IT	73%	27%
5	NIFTY MEDIA	51%	49%
6	NIFTY METAL	11%	89%
7	NIFTY PHARMA	12%	88%
8	NIFTY REALTY	15%	85%

Source: Author's own contribution

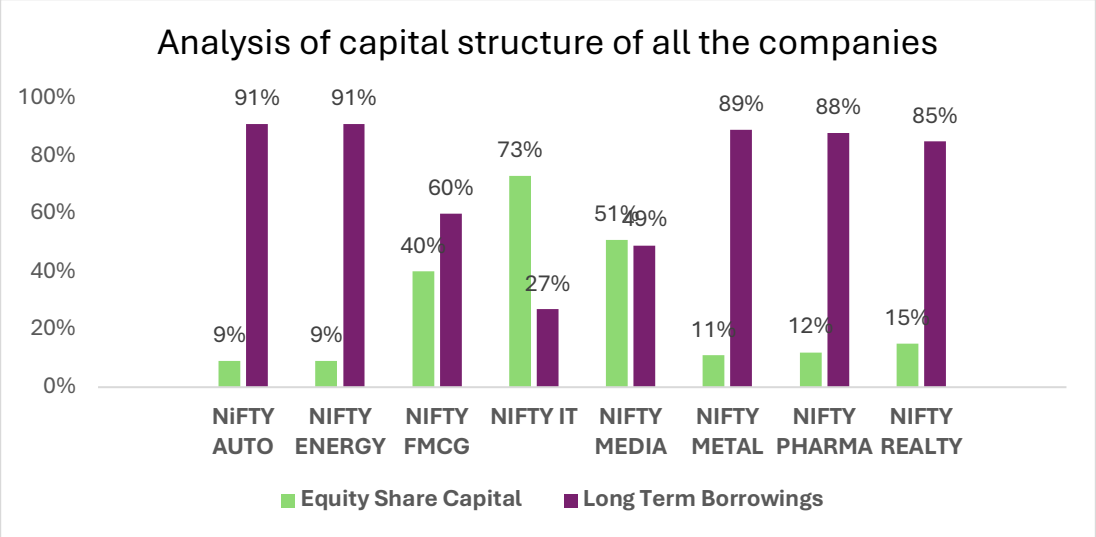

Figure: 4.2 Analysis of capital structure of all the industries

Source: Author's own contribution

4.4. Capital Structure -Industry-wise analysis

4.4.1. Capital Structure of NIFTY AUTO Industry

Table 4.11 shows the capital structure of the NIFTY AUTO industry. The Auto industry is found to be largely debt driven. Most of the companies in the Auto industry are primarily financed through long-term borrowings. Four companies namely Exide Industries Limited, Eicher Motors Limited, Maruti Suzuki India Limited and Bajaj Auto Limited have the debt ratio less than 50 % and the remaining ten companies under this sector is financed through long term borrowings with the debt ratio above 70%. On analysis of WACC it was revealed that the companies largely financed with debt marks the low WACC. The established automotive companies often have a strong market position and brand recognition, which can lead to lower costs of equity and debt. Interest payments on debt are tax-deductible, which can provide a financial incentive for companies to use debt financing over equity financing. The automotive industry requires significant investments in research and development, manufacturing

facilities, and technology upgrades. This necessitates substantial capital, often leading to higher debt usage

Table 4.11 Capital Structure of companies under NIFTY AUTO

Sr.no	Company	Equity Share Capital	Long Term Borrowing
1	Amara Raja Batteries Limited	23.81%	76.19%
2	Apollo Tyres Limited	3.00%	97.00%
3	Ashok Leyland Limited	12.08%	87.92%
4	Bajaj Auto Limited	67.22%	32.78%
5	Bharat Forge Limited	4.71%	95.29%
6	Bosch Limited	28.73%	71.27%
7	Eicher Motors Limited	63.93%	36.07%
8	Exide Industries Limited	93.42%	6.58%
9	Hero MotoCorp Limited	17.37%	82.63%
10	Mahindra & Mahindra Limited	12.93%	87.07%
11	Maruti Suzuki India Limited	56.88%	43.12%
12	MRF Limited	0.41%	99.59%
13	Tata Motors Limited	5.64%	94.36%
14	TVS Motor Company Limited	6.00%	94.00%

Source: Author's own contribution

4.4.2. Capital Structure of NIFTY ENERGY Industry

Table 4.12 shows the capital structure of the companies under Nifty Energy industry. The Energy industry is found to be largely debt driven. Most of the companies in the Energy industry are primarily financed through long-term borrowings having debt content above 60%. Two companies namely Oil & Natural Gas Corporation Limited and GAIL (India) Limited have the debt ratio 33% and 65% respectively and rest of the companies under this sector have the debt usage above 80%. On relating the WACC

with its capital structure it has been noted that the WACC of the companies under this sector is near to the overall average. Thus, on analysing its impact on capital structure it is observed that companies having higher usage of debt in their capital structure has lower WACC. Companies using higher debt namely HPCL, PGCIL and Reliance Industries have the WACC lower than the overall average. TPCL records the highest debt content in the capital structure in this sector with high WACC. It is observed from the traditional theory of capital structure that the benefit of debt usage diminishes on increasing its usage beyond certain level. Thus, directing the appropriate use of debt in the capital structure marks the benefit of lesser WACC.

Table 4.12 Capital Structure of the Companies under NIFTY ENERGY

Sr.no	Company	Equity Share Capital	Long Term Borrowing
1	Bharat Petroleum Corporation Limited	9.26%	90.74%
2	GAIL (India) Limited	35.05%	64.95%
3	Hindustan Petroleum Corporation Limited	4.95%	95.05%
4	Indian Oil Corporation Limited	16.05%	83.95%
5	NTPC Limited	8.25%	91.75%
6	Oil & Natural Gas Corporation Limited	66.60%	33.40%
7	Power Grid Corporation of India Limited	5.87%	94.13%
8	Reliance Industries Limited	4.53%	95.47%
9	Tata Power Company Limited	2.77%	97.23%

Source: Author's own contribution

4.4.3. Capital Structure of NIFTY FMCG Industry

Table 4.13 shows the capital structure of NIFTY FMCG companies. The FMCG industry experiences 0 to 97% debt in their capital structure. Companies namely Hindustan Unilever Limited and Bajaj Finserv Limited and ITC Limited functions with 100% and 97% equity share capital while other companies in this sector have debt

ranging from 13% to 97%. There is a mixed ratio of debt and equity in this sector. Companies like Britannia Industries Ltd and Godrej Industries Ltd has debt usage above 90% while Hindustan Unilever Limited functions with 0 debt. The WACC also marks the higher rate above the overall average for majority of companies. The FMCG sector often requires significant investments in production facilities, marketing, and distribution networks. This high capital expenditure can cause an increase in the overall cost of capital.

Table 4.13 Capital Structure of the companies under NIFTY FMCG

Sr.no	Company	Equity Share Capital	Long Term Borrowing
1	Britannia Industries Limited	6.16%	93.84%
2	Colgate Palmolive (India) Limited	79.85%	20.15%
3	Dabur India Limited	63.10%	36.90%
4	Emami Limited	42.57%	57.43%
5	Godrej Consumer Products Limited	65.67%	34.33%
6	Godrej Industries Limited	2.70%	97.30%
7	Hindustan Unilever Limited	100.00%	0.00%
8	ITC Limited	96.70%	3.30%
9	Jubilant Foodworks Limited	86.97%	13.03%
10	Nestle India Limited	74.92%	25.08%
11	Tata Global Beverages Limited	40.06%	59.94%
12	United Breweries Limited	10.26%	89.74%
13	United Spirits Limited	14.48%	85.52%

Source: Author's own contribution

4.4.4. Capital Structure of NIFTY IT Industry

Table 4.14 shows the pattern of capital structure in this sector. The IT industry experiences 0 to 43% debt in their capital structure. Companies namely Infosys Limited and Tata Elxsi Limited functions with 100% equity share capital while other companies in this sector have debt ranging from 11% to 44%. The company's debt usage in this sector is comparatively less than other sectors. While interest payments on debt are tax-deductible, the benefits may not always outweigh the risks and costs

associated with taking on debt. Equity financing does not require repayment and can be a more attractive option, despite the higher cost compared to debt, as it does not impose mandatory financial obligations. It suggests that IT companies prefer to maintain financial flexibility to quickly adapt to market changes and invest in new technologies without the constraints of debt repayments.

Table 4.14 Capital Structure of of the companies under NIFTY IT

Sr.no	Company	Equity Share Capital	Long Term Borrowing
1	HCL Technologies Limited	56.34%	43.66%
2	Infosys Limited	100.00%	0.00%
3	Tata Consultancy Services Limited	88.06%	11.94%
4	Tata Elxsi Limited	100.00%	0.00%
5	Tech Mahindra Limited	64.83%	35.17%
6	Wipro Limited	56.31%	43.69%

Source: Author's own contribution

4.4.5. Capital Structure of NIFTY MEDIA Industry

Table 4.15 shows the capital structure of all the companies under MEDIA sector in India. The Media industry has mixed debt equity ratio in the capital structure. It experiences 0 to 93% debt in their capital structure. Companies namely Balaji Telefilms Limited and Sun TV Network Limited functions with 100% equity share capital while other companies namely Balaji Telefilms Limited and PVR Limited has debt ranging of 0% and 93% respectively. This sector is found largely dependent on equity capital. The Indian media sector is characterized by high growth potential, driven by increasing consumer demand and digital transformation. Equity financing allows companies to raise capital without the obligation of repayment, supporting their expansion and innovation efforts. Indian media companies often have high market

valuations, making equity financing an attractive option. Investors are willing to invest in these companies due to their growth prospects and potential returns.

Table 4.15 Capital Structure of the companies under NIFTY MEDIA

Sr.no	Company	Equity Share Capital	Long Term Borrowing
1	Balaji Telefilms Limited	100.00%	0.00%
2	Dish TV India Limited	33.66%	66.34%
3	Jagran Prakashan Limited	30.32%	69.68%
4	Network18 Media & Investments Limited	87.17%	12.83%
5	PVR Limited	7.23%	92.77%
6	Saregama India Limited	90.67%	9.33%
7	Sun TV Network Limited	100.00%	0.00%
8	TV Today Network Limited	77.97%	22.03%
9	TV18 Broadcast Limited	85.50%	14.50%
10	Zee Entertainment Enterprises Limited	74.34%	25.66%
11	Zee Media Corporation Limited	36.43%	63.57%

Source: Author's own contribution

4.4.6. Capital Structure of NIFTY METAL Industry

Table 4.16 shows the capital structure of Metal industry in India. The Metal industry has mixed debt equity ratio in the capital structure. It experiences 0 to 98% debt in their capital structure. Companies namely MOIL Limited and Balaji Telefilms Limited functions with 100% equity share capital while other companies namely Coal India Limited and Jindal Steel & Power Limited has debt ranging from 5% and 99%

respectively. The metal sector requires significant investments in infrastructure, technology, and production facilities. This necessitates substantial capital, often leading to higher debt usage. Interest payments on debt are tax-deductible, providing a financial incentive for companies to use debt financing over equity financing.

Table 4.16 Capital Structure of the Companies under NIFTY METAL

Sr.no	Company	Equity Share Capital	Long Term Borrowing
1	APL Apollo Tubes Limited	22.57%	77.43%
2	Coal India Limited	95.14%	4.86%
3	Hindalco Industries Limited	1.40%	98.60%
4	Hindustan Copper Limited	71.26%	28.74%
5	Hindustan Zinc Limited	50.17%	49.83%
6	Jindal Steel & Power Limited	0.83%	99.17%
7	JSW Steel Limited	1.03%	98.97%
8	MOIL Limited	100.00%	0.00%
9	National Aluminium Company Limited	100.00%	0.00%
10	Ratnamani Metals & Tubes Limited	16.79%	83.21%
11	Steel Authority of India Limited	19.53%	80.47%
12	Tata Steel Limited	3.92%	96.08%
13	Vedanta Limited	1.64%	98.36%
14	Welspun Corp Limited	8.99%	91.01%

Source: Author's own contribution

4.4.7. Capital Structure of NIFTY PHARMA Industry

Table 4.17 shows the capital structure of Pharma companies in India. The Pharmaceutical industry has mixed debt-equity ratio in the capital structure. Companies namely Cipla Limited and Divi's Laboratories Limited functions with 99% and 94% equity share capital while other companies have debt ranging from 5% and 99% respectively. The pharmaceutical sector requires significant investments in research and development, manufacturing facilities, and technology upgrades. This necessitates substantial capital, often leading to higher debt usage. Interest payments

on debt are tax-deductible, providing a financial incentive for companies to use debt financing over equity financing.

Table 4.17 Capital Structure of the companies under NIFTY PHARMA

Sr.no	Company	Equity Share Capital	Long Term Borrowing
1	Aurobindo Pharma Limited	11.56%	88.44%
2	Biocon Limited	52.25%	47.75%
3	Cipla Limited	99.53%	0.47%
4	Divi's Laboratories Limited	94.10%	5.90%
5	Dr. Reddy's Laboratories Limited	19.46%	80.54%
6	Glenmark Pharmaceuticals Limited	1.97%	98.03%
7	Lupin Limited	69.39%	30.61%
8	Piramal Enterprises Limited	1.51%	98.49%
9	Sun Pharmaceutical Industries Limited	7.58%	92.42%

Source: Author's own contribution

4.4.8. Capital Structure of NIFTY REALTY

Table 4.18 shows the capital structure of Realty industry in India. The Realty industry has mixed debt equity ratio in the capital structure. It is found to be majorly inclined towards debt in their capital structure with debt content exceeding 60% of the capital structure. Companies namely DLF Limited and The Phoenix Mills Limited functions with 93% debt capital. Real estate projects require significant investments in land acquisition, construction, and infrastructure development. This necessitates substantial capital, often leading to higher debt usage. Real estate companies may use debt to finance expansion projects, acquisitions, and other growth initiatives. Interest payments on debt are tax-deductible, providing a financial incentive for companies to use debt financing over equity financing.

Table 4.18 Capital Structure of the companies under NIFTY REALTY

Sr.no	Company	Equity Share Capital	Long Term Borrowing
1	Brigade Enterprises Limited	12.53%	87.47%
2	DLF Limited	6.89%	93.11%
3	Godrej Properties Limited	19.24%	80.76%
4	Mahindra Lifespace Developers Limited	27.77%	72.23%
5	Oberoi Realty Limited	40.34%	59.66%
6	Prestige Estates Projects Limited	33.82%	66.18%
7	Sobha Limited	22.66%	77.34%
8	Sunteck Realty Limited	13.17%	86.83%
9	The Phoenix Mills Limited	6.74%	93.26%

Source: Author's own contribution

Following the analysis of the Weighted Average Cost of Capital (WACC) and capital structure patterns, this study delves into examining the relationship between capital structure and its influencing factors. Building on the insights gleaned from the literature review, the key determinants identified as influencing the capital structure of companies include tangibility, non-debt tax shields (NDTS), liquidity, profitability, and WACC. The subsequent sections of this study offer an in-depth investigation into how each of these determinants impacts the capital structure decisions within various industries.

4.5. Analysis of the relation between D/E and the determinants

The study examines the relationship between the capital structure, represented by the Debt-Equity (D/E) ratio, and its determinants to understand how these identified factors influence the D/E ratios of different industries. To explore this relationship,

regression analysis is employed as it facilitates hypothesis testing and identifies correlations between dependent and independent variables. Specifically, multiple regression analysis is utilized to assess the effects of one or more independent variables on a single dependent variable. For instance, the analysis considers how factors such as a firm's liquidity and profitability (independent variables) impact the Debt-Equity ratio (dependent variable).

In this analysis, the D/E ratio serves as the dependent variable, while tangibility, non-debt tax shields (NDTS), liquidity, profitability, and the Weighted Average Cost of Capital (WACC) are the independent variables. This approach helps determine which factors influence the capital structures of various industries. The correlation between variables is assessed using Karl Pearson's coefficient of correlation, a linear correlation coefficient that ranges from -1 to +1. A value of -1 indicates a strong negative correlation, +1 signifies a strong positive correlation, and 0 indicates no correlation (Panneerselvam, 2014). The Pearson correlation coefficient is an inferential statistic used to test the significance of the relationship between an independent and a dependent variable.

Before applying multiple linear regression, key prerequisites such as the normality test and multicollinearity test are considered. The normality test checks whether sample data comes from a normally distributed population, using the Kolmogorov-Smirnov (K-S) normality test. The hypotheses for this test are:

- **H0**: The data follows a normal distribution.
- **H1**: The data does not follow a normal distribution.

Multicollinearity is assessed using the Variance Inflation Factor (VIF), which measures how much the variance of a regression coefficient is inflated due to multicollinearity. A VIF of 1 indicates no multicollinearity, while values exceeding 5 or 10 indicate high multicollinearity among the variables. Additionally, the Durbin-Watson statistic is used to detect autocorrelation in the residuals of a regression model. Autocorrelation occurs when residuals are correlated rather than independently distributed, which can render regression coefficients inefficient and lead to inaccurate hypothesis tests and confidence intervals. The Durbin-Watson statistic ranges from 0 to 4, with values near 2 indicating no autocorrelation, values close to 0 suggesting

positive autocorrelation, and values close to 4 indicating negative autocorrelation. Homoscedasticity or homogeneity of variances is tested through graphical analysis which is an assumption of equal or similar variances in different groups being compared.

4.5.1. Auto Industry

Table 4.19a: Auto Sector Correlation matrix

		D/E	Tangibility	NDTS	Liquidity	Profitability	WACC
D/E	Pearson Corr	1	0.47	0.318	0.415	0.578	-0.341
	Sig. (1-tailed)	-	0.038	0.124	0.062	0.012	0.106
	N	15	15	15	15	15	15
Liquidity	Pearson Corr	0.415	0.589	0.434	1	-0.286	-0.221
	Sig. (1-tailed)	0.062	0.01	0.053	-	0.151	0.215
	N	15	15	15	15	15	15
NDTS	Pearson Corr	0.318	0.729	1	0.434	0.013	-0.034
	Sig. (1-tailed)	0.124	0.001	-	0.053	0.481	0.452
	N	15	15	15	15	15	15
Profitability	Pearson Corr	0.578	0.014	0.013	-0.286	1	-0.15
	Sig. (1-tailed)	0.012	0.48	0.481	0.151	-	0.297
	N	15	15	15	15	15	15
Tangibility	Pearson Corr	0.47	1	0.729	0.589	0.014	-0.518
	Sig. (1-tailed)	0.038	-	0.001	0.01	0.48	0.024
	N	15	15	15	15	15	15
WACC	Pearson Corr	-0.341	-0.518	-0.034	-0.221	-0.15	1
	Sig. (1-tailed)	0.106	0.024	0.452	0.215	0.297	-
	N	15	15	15	15	15	15

Source: Author's own contribution

Table 4.19a shows the Auto sector correlation matrix, it is found that tangibility, liquidity, NDTS, profitability and WACC is positively correlated with the debt ratio at 1% significance level. Profitability and tangibility are found to have significant relations as its sig. value is .012 and .038 respectively. Thus, it may be said that profitability and tangibility have correlation with the Debt Equity Ratio of the Auto sector.

Table 4.19b: Auto Sector Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.578[a]	0.334	0.283	40.33442	
2	.837[b]	0.7	0.65	28.16665	
3	.846[c]	0.715	0.557	31.6996	2.317

Source: Author's own contribution

Table 4.19c: Auto Sector Annova

Model		Sum of Squares	Degree of Freedom	Mean Square	F	Sig.
1	Regression	10604.092	1	10604.092	6.518	.024[b]
	Residual	21149.254	13	1626.866		
	Total	31753.346	14			
2	Regression	22233.027	2	11116.513	14.012	.001[c]
	Residual	9520.32	12	793.36		
	Total	31753.346	14			
3	Regression	22709.566	5	4541.913	4.52	.024[d]
	Residual	9043.78	9	1004.864		
	Total	31753.346	14			

Source: Author's own contribution

Table 4.19d: Auto Sector Regression Coefficients

Model	Model Predictors	B	Std. Error	Beta	t	Sig.	Tolerance	Variance Inflating Factor
1	Constant	223.225	53.014		4.211	0.001		
	Profitability	60.556	23.719	0.578	2.553	0.024	1	1
2	Constant	-203.691	117.493		-1.734	0.109		
	Profitability	79.45	17.283	0.758	4.597	0.001	0.918	1.089
	Liquidity	19.096	4.988	0.631	3.829	0.002	0.918	1.089
3	Constant	-225.987	210.816		-1.072	0.312		
	Profitability	76.028	20.309	0.726	3.744	0.005	0.842	1.187
	Liquidity	16.416	7.166	0.543	2.291	0.048	0.564	1.774
	Tangibility	24.57	69.38	0.146	0.354	0.731	0.187	5.343
	NDTS	-37.025	347.622	-0.034	-0.107	0.918	0.302	3.312
	WACC	-4.544	31.107	-0.038	-0.146	0.887	0.456	2.193

Source: Author's own contribution

In Table 4.19d, DR is the dependent variable, and constant, tangibility, NDTS, liquidity, profitability, WACC are the predictors. Table 4.19b shows R^2 value in the range of .334, meaning that nearly 33% of the variations occurred in DR is explained by the independent variables. Table 4.19c provides the ANOVA analysis where the table includes sum of squares, degree of freedom, mean square, F, and Sig.; the value of F and P are 6.52 and .024, respectively, showing that the model is statistically significant. Overall, the independent variables are statistically significant, and so is the model. Table 4.19d, which includes the regression coefficients, shows that profitability has significant relation with DR.

It was found that there is no multicollinearity as the values are less than 5 and the value of VIF <5 is moderate and acceptable. These results mark the positive influence of liquidity on the debt equity ratio of the firm.

Rest of the variables like liquidity, NDTS, tangibility and WACC do not have significant correlation with debt ratio, and therefore, with increase in them, the debt ratio decreases and vice versa.

The Auto sector has a mixed proportion of debt and equity in the capital structure. The positive impact of profitability is noticed by the debt equity ratio in this industry sector. Auto companies often require substantial capital for manufacturing facilities, technology, and research and development. Profitable auto companies are more likely to take on debt to leverage the tax shield benefits without a significant risk of financial distress. . The Trade-Off Theory suggests that companies balance the benefits and costs of debt to determine their optimal capital structure. Thus, a profitable auto company may have a higher debt-equity ratio because it can afford to balance the costs and benefits effectively.

4.5.2. Energy Industry

Table 4.20a: Energy Sector Correlation matrix

		D/E	Tangibility	NDTS	Liquidity	Profitability	WACC
D/E	Pearson Corr	1	0.458	0.035	-0.003	-0.245	-0.53
	Sig. (1-tailed)	-	0.043	0.45	0.496	0.189	0.021
	N	15	15	15	15	15	15
Liquidity	Pearson Corr	-0.003	-0.741	-0.371	1	0.361	-0.073
	Sig. (1-tailed)	0.496	0.001	0.086	-	0.093	0.398
	N	15	15	15	15	15	15
NDTS	Pearson Corr	0.035	0.552	1	-0.371	0.066	0.477
	Sig. (1-tailed)	0.45	0.016	-	0.086	0.407	0.036
	N	15	15	15	15	15	15
Profitability	Pearson Corr	-0.245	-0.25	0.066	0.361	1	0.118
	Sig. (1-tailed)	0.189	0.184	0.407	0.093	-	0.337
	N	15	15	15	15	15	15
Tangibility	Pearson Corr	0.458	1	0.552	-0.741	-0.25	-0.128
	Sig. (1-tailed)	0.043	-	0.016	0.001	0.184	0.324
	N	15	15	15	15	15	15
WACC	Pearson Corr	-0.53	-0.128	0.477	-0.073	0.118	1
	Sig. (1-tailed)	0.021	0.324	0.036	0.398	0.337	-
	N	15	15	15	15	15	15

Source: Author's own contribution

Table 4.20a shows the Energy sector correlation matrix. It is found that tangibility, liquidity, NDTS, profitability and WACC are positively correlated with the debt ratio at 1% significance level. WACC and tangibility are found to have significant relation as its sig. value is .021 and .043 respectively. Thus, it may be said that WACC and tangibility have correlation with the Debt Equity Ratio of the FMCG sector industry.

Table 4.20b: Energy Sector Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.801[a]	0.642	0.443	20.2421	1.172913468

Source: Author's own contribution

Table 4.20c: Energy Sector Regression Coefficients

Model		B	Std. Error	Beta	T	Sig.	Tolerance	VIF
1	Constant	-377.272	219.626		-1.718	0.12		
	Tangibility	104.085	48.454	0.914	2.148	0.06	0.22	4.547
	NDTS	-41.497	427.666	-0.033	-0.097	0.925	0.338	2.962
	Liquidity	10.48	4.833	0.726	2.168	0.058	0.355	2.813
	Profitability	-51.626	47.58	-0.24	-1.085	0.306	0.817	1.224
	WACC	-31.829	29.573	-0.315	-1.076	0.31	0.464	2.156

Source: Author's own contribution

Table 4.20d: Energy Sector Annova

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	6602.353	5	1320.471	3.223	.061[b]
	Residual	3687.685	9	409.743		
	Total	10290.038	14			

Source: Author's own contribution

In Table 4.20c, DR is the dependent variable, and constant, Tang, NDTS, LIQ, Profitability, WACC are the predictors. Table 4.5.2b shows R^2 value to be in the range of .642, meaning that nearly 64% of the variations occurred in DR is explained by the independent variables. Table 4.20d provides the ANOVA analysis where the table includes sum of squares, degree of freedom, mean square, F, and Sig.; the value of F and P are 3.23 and .061, respectively, showing that the model is statistically significant. Overall, the independent variables are statistically significant, and so is the model. Table 4.20d, which includes the regression coefficients, shows that tangibility and liquidity have significant relation with DR.

It is found that there is no multicollinearity as the values are less than 5 and the value of VIF <5 is moderate and acceptable. These results mark the positive influence of liquidity on the debt equity ratio of the firm.

The rest of the variables like NDTS, profitability and WACC does not have significant correlation with debt ratio.

The Energy sector has major reliance on debt in the capital structure. The positive impact of tangibility and liquidity is notified on debt equity ratio in this sector. The Trade-Off Theory posits that companies balance the benefits and costs of debt to determine their optimal capital structure. Tangible assets provide collateral value, which can reduce the cost of borrowing. Energy companies often have significant tangible assets, such as infrastructure, equipment, and natural resources. These assets can be used as collateral, making it easier and cheaper for these companies to secure debt. Consequently, companies with higher tangibility are more likely to have higher

debt-equity ratios, as they can leverage their assets to obtain financing at favourable terms.

4.5.3. FMCG Industry

Table 4.21a: FMCG Sector Correlation matrix

		D/E	Tangibility	NDTS	Liquidity	Profitability	WACC
D/E	Pearson Corr	1	0.614	-0.221	0.138	-0.326	0.184
	Sig. (1-tailed)	-	0.007	0.214	0.313	0.118	0.256
	N	15	15	15	15	15	15
Liquidity	Pearson Corr	0.138	0.27	0.531	1	0.087	0.556
	Sig. (1-tailed)	0.313	0.165	0.021	-	0.379	0.016
	N	15	15	15	15	15	15
NDTS	Pearson Corr	-0.221	0.485	1	0.531	-0.231	0.36
	Sig. (1-tailed)	0.214	0.034	-	0.021	0.203	0.094
	N	15	15	15	15	15	15
Profitability	Pearson Corr	-0.326	-0.341	-0.231	0.087	1	0.024
	Sig. (1-tailed)	0.118	0.106	0.203	0.379	-	0.467
	N	15	15	15	15	15	15
Tangibility	Pearson Corr	0.614	1	0.485	0.27	-0.341	0.143
	Sig. (1-tailed)	0.007	-	0.034	0.165	0.106	0.306
	N	15	15	15	15	15	15
WACC	Pearson Corr	0.184	0.143	0.36	0.556	0.024	1
	Sig. (1-tailed)	0.256	0.306	0.094	0.016	0.467	-
	N	15	15	15	15	15	15

Source: Author's own contribution

Table 4.21a provides FMCG sector correlation matrix, it is found that tangibility, liquidity, NDTS, Profitability and WACC is positively correlated with the debt ratio at 1% significance level. Tangibility is found to have significant relation as its significance value is .007. Thus, it may be said that tangibility has correlation with the Debt Equity Ratio of the FMCG sector industry.

Table 4.21b: FMCG Sector Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.614[a]	0.377	0.329	34.43155	
2	.854[b]	0.729	0.684	23.62668	
3	.959[c]	0.919	0.875	14.88245	2.314

Source: Author's own contribution

Table 4.21c: FMCG Sector Annova

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	9326.203	1	9326.203	7.867	.015[b]
	Residual	15411.913	13	1185.532		
	Total	24738.115	14			
2	Regression	18039.473	2	9019.736	16.158	.000[c]
	Residual	6698.642	12	558.22		
	Total	24738.115	14			
3	Regression	22744.73	5	4548.946	20.538	.000[d]
	Residual	1993.386	9	221.487		
	Total	24738.115	14			

Source: Author's own contribution

Table 4.21d: FMCG Sector Regression Coefficients

Model		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	Constant	-250.773	113.898		-2.202	0.046		
	Tangibility	73.903	26.349	0.614	2.805	0.015	1	1
2	Constant	-155.057	81.825		-1.895	0.082		
	Tangibility	113.489	20.671	0.943	5.49	0	0.765	1.307
	NDTS	-560.722	141.925	-0.679	-3.951	0.002	0.765	1.307

Source: Author's own contribution

In Table 4.21d, DR is the dependent variable, and constant, tangibility and NDTS are the predictors. Table 4.21b shows R^2 value in the range of .377, meaning that nearly 38% of the variations occurred in DR is explained by the independent variables. Table 4.21c provides the ANOVA analysis where the table includes sum of squares, degree of freedom, mean square, F, and Sig.; the value of F and P are 7.87 and .015, respectively, showing that the model is statistically significant. Overall, the independent variables are statistically significant, and so is the model. Table 4.21d, which includes the regression coefficients, shows that tangibility has significant relation with DR.

It is found that there is no multicollinearity as the values are less than 5 and the value of VIF <5 is moderate and acceptable. These results mark the positive influence of liquidity on the debt equity ratio of the firm.

The rest of the variables like liquidity, NDTS, profitability and WACC do not have correlation with debt ratio, and therefore, with increase in them, the debt ratio decreases and vice versa.

The FMCG sector has a mixed proportionate of debt and equity in the capital structure. The positive impact of liquidity is noticed on the debt equity ratio in this industry sector. FMCG companies with high liquidity can comfortably handle debt repayments due to their strong cash flow management. This reduces the perceived risk to lenders and can lead to more favourable borrowing terms. Therefore, companies with high

liquidity might still opt for debt to benefit from the tax shield, resulting in a higher debt-equity ratio compared to firms with lower liquidity.

4.5.4. IT Industry

Table 4.22a: IT Sector Correlation matrix

		D/E	Tangibility	NDTS	Liquidity	Profitability	WACC
D/E	Pearson Corr	1	0.558	0.495	-0.675	-0.248	-0.305
	Sig. (1-tailed)	-	0.015	0.03	0.003	0.186	0.134
	N	15	15	15	15	15	15
Liquidity	Pearson Corr	-0.675	-0.595	-0.81	1	-0.131	0.074
	Sig. (1-tailed)	0.003	0.01	0	-	0.321	0.397
	N	15	15	15	15	15	15
NDTS	Pearson Corr	0.495	0.671	1	-0.81	0.206	0.006
	Sig. (1-tailed)	0.03	0.003	-	0	0.231	0.491
	N	15	15	15	15	15	15
Profitability	Pearson Corr	-0.248	-0.377	0.206	-0.131	1	0.206
	Sig. (1-tailed)	0.186	0.083	0.231	0.321	-	0.231
	N	15	15	15	15	15	15
Tangibility	Pearson Corr	0.558	1	0.671	-0.595	-0.377	-0.109
	Sig. (1-tailed)	0.015	-	0.003	0.01	0.083	0.349
	N	15	15	15	15	15	15
WACC	Pearson Corr	-0.305	-0.109	0.006	0.074	0.206	1
	Sig. (1-tailed)	0.134	0.349	0.491	0.397	0.231	-
	N	15	15	15	15	15	15

Source: Author's own contribution

Table 4.22a shows the IT sector correlation matrix, it is found that tangibility, liquidity, NDTS, profitability and WACC is positively correlated with the debt ratio at 1% significance level. Liquidity is found to have significant relations as its significance value is.003. Thus, it may be said that liquidity has correlation with the Debt Equity Ratio of the IT sector industry.

Table 4.22b: IT Sector Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.675[a]	0.456	0.414	4.43487	
2	.779[b]	0.607	0.388	4.5304	0.8109772

Source: Author's own contribution

Table 4.22c: IT Sector Annova

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	214.126	1	214.126	10.887	.006[b]
	Residual	255.685	13	19.668		
	Total	469.811	14			
2	Regression	285.09	5	57.018	2.778	.087[c]
	Residual	184.721	9	20.525		
	Total	469.811	14			

Source: Author's own contribution

Table 4.22d: IT Sector Regression Coefficients

Model	Model Predictors	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	Constant	23.01	5.781		3.98	0.002		
	Liquidity	-1.082	0.328	-0.675	-3.3	0.006	1	1
2	Constant	54.99	43.817		1.255	0.241		
	Liquidity	-1.148	0.58	-0.716	-1.98	0.079	0.334	2.993
	Tangibility	2.587	21.864	0.048	0.118	0.908	0.269	3.712
	NDTS	-12.677	99.054	-0.0588523	-0.128	0.901	0.2065991	4.8402919
	Profitability	-16.6	18.686	-0.273	-0.888	0.397	0.464	2.157
	WACC	-5.377	6.072	-0.191	-0.885	0.399	0.941	1.062

Source: Author's own contribution

In Table 4.22d, Debt Equity Ratio is the dependent variable, and constant, Tang, NDTS, LIQ, Profitability, WACC are the predictors. Table 4.22b shows that R^2 value is found to be in the range of .456, meaning that nearly 46% of the variations occurred in DR is explained by the independent variables. Table 4.22c provides the ANOVA analysis which includes sum of squares, degree of freedom, mean square, F, and Sig.; the value of F and P are 10.88 and .006, respectively, showing that the model is statistically significant. Overall, the independent variables are statistically significant, and the so is the model. Table 4.22d, which includes the regression coefficients, shows that liquidity, has significant relation with DR.

It is found that there is no multicollinearity as the values are less than 5 and the value of VIF <5 is moderate and acceptable. These results mark the positive influence of liquidity on the debt equity ratio of the firm.

Rest of the variables like Tang, NDTS, Profit and WACC do not have correlation with debt ratio, and therefore, with increase in them, the debt ratio decreases and vice versa. The IT sector has mixed proportionate of debt and equity in the capital structure. The positive impact of liquidity is notified on debt equity ratio in the IT sector industry. Although IT companies have high liquidity, they typically operate with an asset-light business model, which reduces their need for large capital expenditures. As a result, they may not benefit as much from the tax shield provided by debt. Therefore, despite their ability to handle debt repayments, IT companies with high liquidity might still opt for lower debt levels, leading to a lower debt-equity ratio.

4.5.5. Media Industry

Table 4.23a: Media Sector Correlation matrix

		D/E	Tangibility	NDTS	Liquidity	Profitability	WACC
D/E	Pearson Corr	1	0.206	0.316	0.536	0.027	-0.444
	Sig. (1-tailed)	-	0.231	0.126	0.02	0.462	0.049
	N	15	15	15	15	15	15
Liquidity	Pearson Corr	0.536	0.114	0.202	1	0.2	-0.332
	Sig. (1-tailed)	0.02	0.343	0.235	-	0.237	0.114
	N	15	15	15	15	15	15
NDTS	Pearson Corr	0.316	0.693	1	0.202	0.313	-0.137
	Sig. (1-tailed)	0.126	0.002	-	0.235	0.128	0.313
	N	15	15	15	15	15	15
Profitability	Pearson Corr	0.027	0.292	0.313	0.2	1	-0.131
	Sig. (1-tailed)	0.462	0.146	0.128	0.237	-	0.321
	N	15	15	15	15	15	15
Tangibility	Pearson Corr	0.206	1	0.693	0.114	0.292	0.319
	Sig. (1-tailed)	0.231	-	0.002	0.343	0.146	0.124
	N	15	15	15	15	15	15
WACC	Pearson Corr	-0.444	0.319	-0.137	-0.332	-0.131	1
	Sig. (1-tailed)	0.049	0.124	0.313	0.114	0.321	-
	N	15	15	15	15	15	15

Source: Author's own contribution

Table 4.23a shows the correlation matrix of the Media sector. From Table4.23a, it is found that tangibility, liquidity, NDTS, profitability and WACC is positively correlated with the debt ratio at 1% significance level. Liquidity and WACC are found to have significant relation as its significance value is.020 and 0.049 respectively. Thus, it may be said that liquidity and WACC has correlation with the Debt Ratio of the Media sector industry.

Table 4.23b: Media Sector Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.536[a]	0.287	0.232	4.34578	
2	.695[b]	0.483	0.196	4.44696	1.8792136

Source: Author's own contribution

Table 4.23c: Media Sector Annova

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	98.874	1	98.874	5.235	.040[b]
	Residual	245.515	13	18.886		
	Total	344.389	14			
2	Regression	166.41	5	33.282	1.683	.234[c]
	Residual	177.979	9	19.775		
	Total	344.389	14			

Source: Author's own contribution

Table 4.23d: Media Regression coefficients

Model		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	Constant	-0.886	9.258		-0.096	0.925		
	Liquidity	0.724	0.316	0.536	2.288	0.04	1	1
2	Constant	3.787	12.977		0.292	0.777		
	Liquidity	0.516	0.356	0.382	1.449	0.181	0.828	1.208
	Tangibility	4.769	4.926	0.409	0.968	0.358	0.322	3.11
	NDTS	-1.445	13.337	-0.042	-0.108	0.916	0.375	2.666
	Profitability	-2.739	3.253	-0.219	-0.842	0.422	0.851	1.175
	WACC	-4.904	3.275	-0.482	-1.497	0.169	0.555	1.802

Source: Author's own contribution

In Table 4.23d, Debt Equity Ratio is the dependent variable, and constant, tangibility, NDTS, liquidity, profitability and WACC are the predictors. R^2 value is found to be in the range of .287, meaning that nearly 29% of the variations occurred in DR is explained by the independent variables. Table 4.23c provides the ANOVA analysis which includes sum of squares, degree of freedom, mean square, F, and Sig.; the value of F and P are 5.235and .040, respectively, showing that the model is statistically significant. Overall, the independent variables are statistically significant, and the so is the model. Table 4.23d, which includes the regression coefficients, shows that liquidity has significant relation with DR.

It is found that there is no multicollinearity as the values are less than 5 and the value of VIF <5 is moderate and acceptable. These results mark the positive influence of liquidity on the debt equity ratio of the firm. Rest of the variables like tangibility, NDTS, Profitability and WACC do not have correlation with debt ratio, and therefore, with increase in them, the debt ratio decreases and vice versa.

The Media sector has mixed debt equity proportion in their capital structure. They are observed not to rely heavily on debt for their capital structure requirement. The positive impact of liquidity is notified on debt equity ratio in Media sector industry. While media companies with high liquidity can handle debt repayments efficiently due to their strong cash flow management, they might not require as much debt due to lower capital expenditure needs compared to other sectors. As a result, even though they have the capacity to manage debt, they might still prefer to maintain lower debt levels, leading to a lower debt-equity ratio.

4.5.6. Metal Industry

Table 4.24a: Metal Sector Correlation matrix

		D/E	Tangibility	NDTS	Liquidity	Profitability	WACC
D/E	Pearson Corr	1	0.835	0.646	-0.171	-0.378	0.29
	Sig. (1-tailed)	-	0	0.005	0.271	0.083	0.147
	N	15	15	15	15	15	15
Liquidity	Pearson Corr	-0.171	-0.449	-0.622	1	-0.234	-0.348
	Sig. (1-tailed)	0.271	0.046	0.007	-	0.201	0.102
	N	15	15	15	15	15	15
NDTS	Pearson Corr	0.646	0.772	1	-0.622	0.097	0.386
	Sig. (1-tailed)	0.005	0	-	0.007	0.366	0.078
	N	15	15	15	15	15	15
Profitability	Pearson Corr	-0.378	-0.252	0.097	-0.234	1	0.183
	Sig. (1-tailed)	0.083	0.182	0.366	0.201	-	0.257
	N	15	15	15	15	15	15
Tangibility	Pearson Corr	0.835	1	0.772	-0.449	-0.252	0.367
	Sig. (1-tailed)	0	-	0	0.046	0.182	0.089
	N	15	15	15	15	15	15
WACC	Pearson Corr	0.29	0.367	0.386	-0.348	0.183	1
	Sig. (1-tailed)	0.147	0.089	0.078	0.102	0.257	-
	N	15	15	15	15	15	15

Source: Author's own contribution

Table 4.24a provides the correlation matrix of Metal Sector. From Table 4.24a, it is found that tangibility and NDTS are significantly correlated with the debt ratio at 1% significance level. Tangibility and NDTS are found to have significant relation as its significance value is 0 and 0.005. Thus, it may be said that tangibility and NDTS have correlation with the Debt Equity Ratio of the Metal sector industry.

Table 4.24b: Metal Sector Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.835[a]	0.697	0.674	53.33914	
2	.889[b]	0.79	0.674	53.37653	1.6310487

Source: Author's own contribution

Table 4.24c: Metal Sector Annova

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	85260.261	1	85260.261	29.968	.000[b]
	Residual	36985.827	13	2845.064		
	Total	122246.089	14			
2	Regression	96604.605	5	19320.921	6.782	.007[c]
	Residual	25641.484	9	2849.054		
	Total	122246.089	14			

Source: Author's own contribution

Table 4.24d: Metal Sector Regression Coefficients

Model		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	Constant	-505.041	159.452		-3.167	0.007		
	Tangibility	155.891	28.477	0.835	5.474	0	1	1
2	Constant	-565.523	302.657		-1.869	0.095		
	Tangibility	120.44	53.957	0.645	2.232	0.053	0.279	3.585
	NDTS	449.804	400.217	0.33	1.124	0.29	0.271	3.688
	Liquidity	3.565	2.372	0.3029936	1.503	0.167	0.5736494	1.7432251
	Profitability	-44.306	44.478	-0.188	-0.996	0.345	0.653	1.531
	WACC	26.13	68.916	0.066	0.379	0.713	0.775	1.291

Source: Author's own contribution

Table 4.24d shows that tangibility, NDTS, liquidity, profitability and WACC are the predictors of debt ratio. R^2 value is found to be in the range of .697, meaning that nearly 70% of the variations occurred in DR is explained by the independent variables as shown in Table 4.24b. Table 4.24c provides the ANOVA analysis where the table includes sum of squares, degree of freedom, mean square, F, and Sig.; the value of F and P are 29.9 and .00, respectively, showing that the model is statistically significant. Overall, the independent variables are statistically significant, and so is the model. Table 4.24d, which includes the regression coefficients, shows that tangibility, has significant relation with DR.

It is found that there is no multicollinearity as the values are less than 5 and the value of VIF <5 is moderate and acceptable. These results mark the positive influence of tangibility on the debt equity ratio of the firm while no association with WACC is notified.

Rest of the variables like NDTS, profitability, liquidity and WACC do not have correlation with debt ratio, and therefore, with increase in them, the debt ratio decreases and vice versa.

The Metal sector is largely financed by debt in their capital structure. The positive impact of tangibility on debt equity ratio represents that this sector can fetch long-term borrowings in their capital structure with the considerable influence of fixed assets. The Trade-Off Theory suggests that companies balance the benefits and costs of debt to determine their optimal capital structure. Tangible assets provide collateral value, which can reduce the cost of borrowing. Metal companies often have substantial tangible assets, such as machinery, equipment, and raw materials. These assets can be used as collateral, making it easier and cheaper for these companies to secure debt. Consequently, companies with higher tangibility are more likely to have higher debt-equity ratios, as they can leverage their assets to obtain financing at favourable terms.

4.5.7. Pharma Industry

Table 4.25a: Pharma Sector Correlation matrix

		D/E	Tangibility	NDTS	Liquidity	Profitability	WACC
D/E	Pearson Corr	1	-0.667	-0.172	0.426	-0.509	-0.352
	Sig. (1-tailed)	-	0.003	0.27	0.057	0.026	0.099
	N	15	15	15	15	15	15
Liquidity	Pearson Corr	0.426	-0.704	-0.117	1	0.067	-0.802
	Sig. (1-tailed)	0.057	0.002	0.338	-	0.406	0
	N	15	15	15	15	15	15
NDTS	Pearson Corr	-0.172	0.14	1	-0.117	0.058	0.012
	Sig. (1-tailed)	0.27	0.309	-	0.338	0.418	0.482
	N	15	15	15	15	15	15
Profitability	Pearson Corr	-0.509	0.359	0.058	0.067	1	-0.061
	Sig. (1-tailed)	0.026	0.094	0.418	0.406	-	0.414
	N	15	15	15	15	15	15
Tangibility	Pearson Corr	-0.667	1	0.14	-0.704	0.359	0.366
	Sig. (1-tailed)	0.003	-	0.309	0.002	0.094	0.09
	N	15	15	15	15	15	15
WACC	Pearson Corr	-0.352	0.366	0.012	-0.802	-0.061	1
	Sig. (1-tailed)	0.099	0.09	0.482	0	0.414	-
	N	15	15	15	15	15	15

Source: Author's own contribution

Table 4.25a shows the Pharma sector correlation matrix, it is found that liquidity is positively correlated with the debt ratio at 1% significance level and the rest of the variables are negatively correlated. Tangibility is found to have significant relation as its significance value is less than 0.005, Thus, it may be said that tangibility and liquidity have correlation with the Debt Equity Ratio of the Pharma sector industry.

Table 4.25b: Pharma Sector Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.667[a]	.445	.402	55.55346	
2	.767[b]	.588	.359	57.52085	1.476743463

Source: Author's own contribution

Table 4.25c: Pharma Sector Annova

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	32162.784	1	32162.784	10.422	.007[b]
	Residual	40120.428	13	3086.187		
	Total	72283.213	14			
2	Regression	42505.381	5	8501.076	2.569	.104[c]
	Residual	29777.831	9	3308.648		
	Total	72283.213	14			

Source: Author's own contribution

Table 4.25d: Pharma Sector Regression Coefficients

Model		B	Std. Error	Beta	T	Sig.	Tolerance	VIF
1	Constant	508.834	114.914		4.428	.001		
	Tangibility	-190.111	58.890	-.667	-3.228	.007	1.000	1.000
2	Constant	886.731	525.433		1.688	.126		
	Tangibility	-195.451	127.271	-.686	-1.536	.159	.230	4.357
	NDTS	-527.483	1114.928	-.103	-0.473	.647	.962	1.039
	Liquidity	-5.955	9.343	-0.407868969	-0.637	.540	0.111799289	8.9446007
	Profitability	-46.265	50.741	-.256	-0.912	.386	.580	1.724
	WACC	-50.627	50.046	-.443	-1.012	.338	.238	4.195

Source: Author's own contribution

In Table 4.25d it shows tangibility as the predictor. R^2 value is found to be in the range of 0.445, meaning that nearly 44.5% of the variations occurred in DR is explained by the independent variables shown in Table 4.25b. Table 4.25c provides the ANOVA analysis where the table includes sum of squares, degree of freedom, mean square, F, and Sig.; the value of F and P are 10.422 and .007, respectively, showing that the model is statistically significant. Overall, the independent variables are statistically significant, and so is the model. Table 4.25d, which includes the regression coefficients, shows that tangibility, has significant relation with DR.

It is found that there is no multicollinearity as the values are less than 5 and the value of VIF <5 is moderate and acceptable. These results mark the positive influence of tangibility on the debt equity ratio of the firm while no association with WACC is notified. Rest of the variables like NDTS, profitability, liquidity and WACC do not have correlation with debt ratio, and therefore, with increase in them, the debt ratio decreases and vice versa.

The Pharma sector is largely financed by debt in their capital structure. The positive impact of tangibility on debt equity ratio represents that this sector can fetch long-term borrowings in their capital structure with the considerable influence of fixed assets. Pharmaceutical companies often possess significant tangible assets, such as manufacturing plants, laboratories, and equipment. These assets can be used as collateral, reducing the risk for lenders and subsequently lowering borrowing costs.

The reduced cost of debt makes it an attractive option, leading to higher debt usage. Additionally, the interest tax shield benefits of debt can be maximized when tangible assets back the borrowing.

4.5.8. Realty Industry

Table 4.26a: Reality Sector Correlation matrix

		D/E	Tangibility	NDTS	Liquidity	Profitability	WACC
D/E	Pearson Corr	1	0.043	-0.169	0.178	-0.208	-0.208
	Sig. (1-tailed)	-	0.439	0.274	0.262	0.229	0.229
	N	15	15	15	15	15	15
Liquidity	Pearson Corr	0.178	0.356	-0.475	1	-0.023	-0.023
	Sig. (1-tailed)	0.262	0.096	0.037	-	0.467	0.467
	N	15	15	15	15	15	15
NDTS	Pearson Corr	-0.169	0.478	1	-0.475	0.655	0.655
	Sig. (1-tailed)	0.274	0.036	-	0.037	0.004	0.004
	N	15	15	15	15	15	15
Profitability	Pearson Corr	-0.208	0.643	0.655	-0.023	1	1
	Sig. (1-tailed)	0.229	0.005	0.004	0.467	-	0
	N	15	15	15	15	15	15
Tangibility	Pearson Corr	0.043	1	0.478	0.356	0.643	0.643
	Sig. (1-tailed)	0.439	-	0.036	0.096	0.005	0.005
	N	15	15	15	15	15	15
WACC	Pearson Corr	-0.208	0.643	0.655	-0.023	1	1
	Sig. (1-tailed)	0.229	0.005	0.004	0.467	0	-
	N	15	15	15	15	15	15

Source: Author's own contribution

Table 4.26a shows the Realty sector correlation matrix. This table provides an analysis where the correlation value can be observed in each cell; signs denote the correlation direction. Minus and plus signs indicate the negative correlation and positive correlation, respectively. Significant tests for each correlation can be noticed in the second row of each cell. It indicates the probability of a particular correlation. If the significance level is less than 0.005, statistically high significance is considered for that correlation. N (in the third row) indicates the number of cases taken part in this study/analysis.

Thus, from Table 4.26a, it is found that tangibility and liquidity are positively correlated with the debt ratio at 1% significance level and rest of the variables are negatively correlated.

Thus, it may be said that tangibility and liquidity have correlation with the Debt Equity Ratio of the Realty sector industry.

Table 4.26b: Reality Sector Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.319[a]	0.102	-0.257	10.51037	1.58295205

Source: Author's own contribution

Table 4.26c Reality Sector Annova

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	125.207	4	31.302	0.283	.882[b]
	Residual	1104.679	10	110.468		
	Total	1229.887	14			

Source: Author's own contribution

Table 4.26d: Reality Sector Regression coefficients

Model		B	Std. Error	Beta	T	Sig.	Tolerance	VIF
1	(Constant)	61.72	38.651		1.597	0.141		
	Tangibility	7.77	15.56	0.271	0.499	0.628	0.304	3.286
	NDTS	-46.84	692.556	-0.041	-0.068	0.947	0.244	4.095
	Liquidity	0.091	0.874	0.054	0.104	0.92	0.33	3.031
	WACC	-20.95	27.184	-0.354	-0.771	0.459	0.426	2.349

Source: Author's own contribution

In Table 4.26d tangibility, NDTS, liquidity and WACC are the predictors. Table 4.26b shows R^2 value to be in the range of 0.102, meaning that nearly 10% of the variations occurred in DR is only explained by independent variables. Table 4.26c provides the ANOVA analysis where the table includes sum of squares, degree of freedom, mean square, F, and Sig.; the value of F and P are .283 and .882, respectively, showing that the model is statistically significant. Overall, the independent variables are statistically significant, and so is the model. Table 4.26d, which includes the regression coefficients, shows that tangibility, and liquidity shows positive sign and are significant at 6.3% and 9.2% level, respectively, NDTS and WACC are sharing negative sign with DR.

The variance-inflating factor for each variable is included to check the multicollinearity (Gujarati &Sangeetha, 2007). It was found that the values show that there is no multicollinearity as the values are less than 5 and the value of VIF <5 is moderate and acceptable. These results mark the positive influence of tangibility and liquidity on the debt ratio of the firm while no association with WACC is notified.

Rest of the variables like NDTS and WACC have negative correlation with debt ratio, and therefore, with increase in them, the debt ratio decreases and vice versa, leading to raise more concern among the lenders.

The Realty sector is financed by debt in their capital structure. The positive impact of tangibility and liquidity on debt equity ratio represents that this sector can fetch long-term borrowings in their capital structure with the considerable influence of fixed assets and liquidity. Real estate companies typically possess significant tangible assets, such as land, buildings, and infrastructure. These assets can be used as collateral, lowering the risk for lenders and reducing borrowing costs. Trade-Off Theory suggests that tangible assets provide collateral value, which can reduce the cost of borrowing. The availability of substantial collateral makes debt a more attractive and accessible financing option, leading to higher debt usage in the realty sector.

4.6. Results and Findings

This study was undertaken to understand the capital structure pattern and cost of capital of the selected industries under NIFTY index and determines the relation of debt equity with the selected variables namely tangibility, NDTS, liquidity, profitability and WACC. The capital structure pattern reveals the higher usage of debt in comparison to equity in majorly every sector except IT industry which has higher equity capital than debt capital. The capital structure pattern is not same for all the industries, it varies from industry to industry. Debt usage ranges from 20% to 100 %. The debt usage in Auto, Energy, Metal, Pharma and Realty range is 80% and above. The WACC varies from industry to industry. The weighted average cost of capital of Auto and Energy industry is recorded as 10.02 and 9.64 respectively which is the least in comparison to other industries WACC.

The cost of capital and capital structure pattern analysis has built an informative background in the study. The WACC analysis has shown the highest to lowest along with overall average of WACC of the industries. It has shown that Realty industry has the highest and the Energy industry has the lowest WACC. On scrutinising the capital structure pattern of the industries, it was revealed that Realty industry and Energy industry is exposed to higher debt usage in its capital structure and majority of companies under these sectors relies on debt financing. Further there is a positive relation of WACC, tangibility and liquidity with Debt-Equity ratio while tangibility and liquidity have significant relation with the Debt Equity ratio of the Energy sector. There is no significant association observed of the identified independent variables in case of Realty Sector on the debt equity ratio. Real estate markets are highly cyclical, with periods of boom and bust. Fluctuations in property values and rental incomes can lead to higher risk premiums, increasing the cost of capital. Thus, representing the impact of other factors which influence its capital structure. There is more than 85% of debt financing in every sector except IT having 27%, Media 49% and FMCG 60% debt financing to raise capital of the companies. The WACC of Auto, Energy, FMCG and IT industries is 10.02%, 9.64%, 13.36% and 13.56% respectively which is near to or approximately less than the overall average of the industries which is computed as 13.54%. Thus, the higher debt financing in Auto, Energy and FMCG is yielding the

lower WACC. IT and Media industry has the lowest debt financing as 73% and 51% respectively in their capital structure and Media marks the high WACC after Realty sector as 15.78. IT companies often rely on equity financing due to their high growth potential and the need for substantial upfront investments without the pressure of regular interest payments.

The findings also reveals that all the mentioned variables have a considerable impact on the capital structure of the firm. No single variable can be held solely responsible for having an impact on the capital structure of the firm. WACC did not prove to have a significant impact on the debt ratio due to its low explanatory value, while tangibility, liquidity, NDTS and profitability played a considerable role as interpreted under specific Tables. Tangibility is found impacting the debt equity ratio in Pharma industry. Tangibility and NDTS has an impact in Metal industry. Liquidity has an impact in Media and IT industry. Tangibility, NDTS and profitability has an impact in FMCG industry. Tangibility, NDTS, profitability and WACC has an impact in Energy Industry and profitability and liquidity has a positive association with debt equity ratio in Auto industry. This shows that tangibility and liquidity are majorly the important variables in explaining the debt ratio of the industries, then other identified variables. This result conveys the identified variables have the significant association explaining the debt equity ratio of the industries. Most of the sectors studied has the impact of these variables on their debt equity ratio except for Real Estate Industry which does not has any significant impact on its debt equity thus demanding to identify other variables which has an association with financial leverage. It shows that large multiproduct firms are less exposed to risk, which allows them to tolerate higher debt ratios than small one-product firms, and that larger firms are more likely to take the advantage of tax deductions for debt and firms can use large amount of tangible assets as collateral to raise debt at cheaper interest rates. Therefore, there is a direct relationship between tangibility/collateral value and leverage of a firm and according to trade off theory profitable firms having greater liquidity are considered less risky may issue cheaper debt and has a direct relationship of leverage with tangibility and liquidity.

CHAPTER 5

SUMMARY AND CONCLUSION

5.1. Summary and Conclusion of the study

This study was undertaken to understand the capital structure pattern and cost of capital of the selected industries namely Auto, Energy, FMCG, IT, Media, Metal, Pharma and Realty under NIFTY index and determine the relationship of debt equity with the selected variables namely Weighted Average Cost of Capital (WACC), Tangibility, Non-Debt Tax Shield (NDTS), Liquidity and Profitability. The foundational study of capital structure originated with the Modigliani-Miller (MM) theorem in 1958, which explored the cost of capital and its relationship to capital structure. Since then, numerous researchers have investigated capital structure from various perspectives. Insights from these studies indicate that the cost of capital does not significantly impact a firm's capital structure. However, there is substantial ambiguity in identifying the variables that influence a firm's capital structure and in understanding the relationship between cost of capital and capital structure. No single theory has gained unanimous acceptance in determining a firm’s optimal capital structure. Most studies have focused on reaching a consensus on other factors, such as market types or diverse accounting measures, as determinants of capital structure. Nevertheless, the relationship between capital structure and cost of capital remains largely unexplored. Amid these complexities, the present study provides a comprehensive examination of the cost of capital, capital structure, and the determinants that influence a firm’s capital structure. This study also thoroughly reviews various prevailing theories that predict the capital structure financing of firms. Although general theories exist, there is limited research on the sector-specific impacts of capital structure on the cost of capital. Moreover, most existing studies concentrate on developed economies, leaving a gap in understanding how capital structure

decisions affect the cost of capital in emerging markets, where financial systems and market conditions vary significantly.

The study aimed to examine the cost of capital and capital structure of selected Indian companies. It assessed the cost of capital across various industries and individual companies to understand the patterns and trends within each sector. The capital structure analysis included both equities share capital and long-term borrowings for all industries and individual companies, providing a comprehensive view of capital structure patterns across different sectors.

The findings indicated that capital structure patterns vary significantly between industries. Most sectors exhibited a higher reliance on debt compared to equity, except for the IT, Media, and FMCG industries, which showed a greater proportion of equity capital than debt. The usage of debt ranged from 20% to 100%, with industries such as Auto, Energy, Metal, Pharma, and Realty demonstrating debt levels above 80%. The Weighted Average Cost of Capital (WACC) also varied across industries, with the IT and Auto sectors having the lowest WACC, around 8%, compared to other industries.IT companies, characterized by high growth potential but often lacking immediate profits, tend to prefer equity financing. This approach allows them to raise capital without the burden of regular interest payments. Media companies, which typically have multiple revenue streams such as advertising, subscriptions, and licensing, also favour equity financing. This supports their need to invest in new technologies and platforms to remain competitive. FMCG companies, on the other hand, maintain low debt levels to ensure financial stability, making equity financing their preferred choice. Several studies support these findings. For instance, Graham & Harvey (2001) highlighted that IT companies rely on equity financing due to their high growth potential and substantial upfront investments, which alleviate the pressure of regular interest payments. Myers (1984) discussed the importance of venture capital and equity financing for startups and high-growth firms in the IT sector. Dittmar & Mahrt-Smith (2007) showed that equity financing in media firms funds diverse revenue streams and maintains financial flexibility. Mitra & Mordani (2012) emphasized the role of equity financing in supporting growth and expansion in the competitive FMCG market.

In contrast, the capital-intensive nature of the metal industry necessitates substantial investments in machinery and plants, leading to higher debt usage. Chen (2021) explored debt financing strategies for new energy vehicle enterprises, highlighting the importance of debt in managing capital needs and optimizing financial structures. Tang & Zhou (2023) investigated the link between energy regulation and the cost of debt financing, underscoring the role of debt in managing compliance costs and uncertainties.

After analyzing the cost of capital and capital structure of the selected Indian companies, the study investigates the association (positive or negative) of the identified determinants with financial leverage by employing multiple regression analysis. The findings reveal that tangibility significantly influences the debt-equity ratio in the Pharma industry. Both tangibility and non-debt tax shields (NDTS) impact the capital structure in the Metal industry. Liquidity plays a crucial role in the Media and IT industries, whereas tangibility, NDTS, and profitability are influential in the FMCG sector. The Energy sector's debt-equity ratio is affected by tangibility, NDTS, profitability, and the Weighted Average Cost of Capital (WACC). In the Auto industry, profitability and liquidity positively correlate with the debt-equity ratio.

These results indicate that tangibility and liquidity are the most critical variables in explaining the debt ratios across various industries. Notably, the study did not find a significant association between the identified variables and the debt-equity ratio in the Realty sector. The Realty sector is highly debt-driven and exhibits the highest WACC among the industries studied. Real estate markets are highly cyclical, experiencing periods of boom and bust. During downturns, companies may increase their debt to maintain operations and invest in new projects when market conditions improve. Fluctuations in property values and rental incomes can lead to higher risk premiums, thereby increasing the cost of capital.

Cvijanović (2014) examines the impact of real estate prices on firm capital structure decisions, finding that firms significantly alter their debt structures in response to fluctuations in real estate prices, leading to increased debt capital. Rampini & Viswanathan (2013) argue that changes in real estate asset values directly impact the value of collateral, thus affecting the debt capacity of firms. This adjustment can result in higher costs of capital. Ghosh & Petrova (2017) analyze the relationship between

capital expenditures and property performance in commercial real estate, identifying capital expenditures as a significant determinant of property returns and a contributor to higher capital costs. Feng & Hardin (2023) highlight the impact of capital investment intensity and strategic location choices on the cost of capital in commercial real estate, noting that higher capital investments and prime locations can lead to increased market valuations and consequently higher costs of raising capital.

The findings demonstrate that the examined variables collectively influence a firm's capital structure, with no single variable dominating the impact. Interestingly, the Weighted Average Cost of Capital (WACC) did not significantly affect the debt ratio, indicating its low explanatory power. Conversely, tangibility, liquidity, Non-Debt Tax Shields (NDTS), and profitability emerged as pivotal factors. This observation suggests that large multiproduct firms, which are less susceptible to risk, can sustain higher debt ratios compared to smaller, single-product firms. Moreover, larger firms tend to benefit from tax deductions on debt and can leverage a substantial amount of tangible assets as collateral to secure debt at lower interest rates.

Supporting this, Rajan & Zingales (1995) found that firms with more tangible assets in the G7 countries tend to use more debt, leveraging these assets as collateral. Booth et al. (2001) confirmed this positive impact of tangibility on leverage in developing countries due to the collateral value of assets. Profitable companies are more likely to take on debt to leverage the tax shield benefits without a significant risk of financial distress. The Trade-Off Theory suggests that companies balance the benefits and costs of debt to determine their optimal capital structure. Thus, profitable companies may have a higher debt-equity ratio because it can afford to balance the costs and benefits effectively. The positive impact of liquidity on debt equity ratio represents that high liquidity can comfortably handle debt repayments due to their strong cash flow management. This reduces the perceived risk to lenders and can lead to more favourable borrowing terms. Therefore, companies with high liquidity might still opt for debt to benefit from the tax shield, resulting in a higher debt-equity ratio compared to firms with lower liquidity.

5.2. Implications of the study

- **Corporate Finance Managers:** They can use the findings to make informed decisions about the optimal mix of debt and equity, aiming to minimize the cost of capital and maximize firm value. The cost of capital serves as a benchmark for evaluating investment opportunities. Projects with returns exceeding the cost of capital are generally considered favourable. It helps in assessing the performance of different business units by comparing their returns to the cost of capital. Finding the right balance between debt and equity financing is crucial. An optimal capital structure minimizes the WACC, thereby maximizing shareholder value. well-structured capital mix can help manage financial risk. Too much debt can increase bankruptcy risk, while too much equity can dilute ownership. Investors and analysts closely scrutinize a company's capital structure. A balanced structure can enhance market confidence and potentially improve stock prices. Maintaining a flexible capital structure allows companies to take advantage of new opportunities and respond to market changes effectively.

- **Investors and Shareholders**: The cost of capital and capital structure is vital for investors and shareholders as it directly influences their decision-making and the valuation of their investments. Understanding capital structure can help investors assess the financial health and risk profile of companies, aiding in better investment decisions. The cost of capital reflects the risk profile of the company. Investors can use the information to evaluate whether a company is likely to generate sufficient returns to justify their investment. A lower cost of capital suggests that the company can fund its operations and growth at a lower cost, potentially leading to higher returns. Investors use the cost of capital as a discount rate in valuation models like the Discounted Cash Flow (DCF) analysis. It helps in determining the present value of future cash flows and thus the intrinsic value of the company’s shares. The information related to capital structure is beneficial as the mix of debt and equity financing affects the overall return on investment. An optimal capital structure that minimizes the Weighted Average Cost of Capital (WACC) can enhance shareholder returns.

- **Policy Makers and Regulators:** Insights from the study can guide policy formulation regarding corporate financing practices and regulations to ensure a stable financial environment. Understanding the implications of the cost of capital and capital structure is vital for policy makers and regulators as it influences economic stability, growth, and investor protection. A lower cost of capital can encourage investment and economic growth, while a higher cost can signal economic risks. Policy makers monitor these trends to implement supportive fiscal and monetary policies. Regulators use the cost of capital to assess the attractiveness of the investment climate. By creating favorable conditions, they can attract both domestic and foreign investments. Regulators set guidelines for optimal capital structures to ensure companies are not excessively leveraged, which reduces the risk of financial crises. Policies that enforce transparency and accountability in corporate financial practices help maintain investor confidence and market integrity. A balanced capital structure supports sustainable business growth, which contributes to overall economic development. Regulators can incentivize such structures through targeted policies.
- **Academicians and Researchers:** The study of cost of capital and capital structure is essential for academicians and researchers, offering profound insights and implications for theoretical and practical applications. The study provides empirical data and analysis that can be used for further research and teaching in the fields of finance and economics. e study helps in developing and refining theoretical models that explain how companies determine their cost of capital and capital structure. Insights from these studies are integral to creating comprehensive and relevant curricula for finance and business courses. They provide a foundational understanding for students pursuing careers in finance. Research in this area enables empirical testing of theoretical models, allowing researchers to validate or challenge existing theories based on real-world data. These studies often intersect with other fields such as economics, accounting, and management, fostering interdisciplinary research that broadens understanding and applications. Researchers can explore new

financial strategies and instruments that optimize capital structure and reduce the cost of capital, contributing to the advancement of financial practices.

- **Credit Rating Agencies:** The cost of capital and capital structure study has significant implications for credit rating agencies. They can use the information to evaluate the creditworthiness of companies more accurately, considering their capital structure and cost of capital. The cost of capital reflects the risk associated with a company's operations and financial practices. Credit rating agencies use it to assess the risk profile of a company, influencing its credit rating. By examining the cost of debt, rating agencies can evaluate a company's ability to service its debt. A lower cost of capital often indicates a stronger ability to meet debt obligations. The mix of debt and equity financing (debt-equity ratio) is a crucial metric for rating agencies. A balanced capital structure indicates prudent financial management and lowers default risk, leading to better credit ratings. Rating agencies assess whether a company has sufficient capital to absorb losses and continue operations. Strong capital adequacy ratios contribute to higher credit ratings.
- **Financial Analysts:** The cost of capital and capital structure study is essential for financial analysts as it influences their analysis, recommendations, and overall strategic insights. Analysts can incorporate the study's findings into their financial models to provide more accurate forecasts and recommendations. Financial analysts can use the cost of capital to discount future cash flows when valuing a company. This helps in determining the intrinsic value of the company's equity and making investment recommendations. Understanding the cost of capital helps analysts evaluate a company's risk profile. A higher cost of capital may indicate higher risk, influencing investment decisions and recommendations. Analysts can assess a company's capital structure to determine its financial health and stability. A well-balanced structure indicates prudent financial management and reduces the risk of financial distress. Based on the analysis of capital structure, financial analysts can provide strategic recommendations to optimize the mix of debt and equity financing. This may include advising on refinancing, issuing new equity, or debt reduction strategies.

5.3. Limitations of the Study

This research is subject to several limitations, primarily due to the reliance on secondary data and the constraints related to time and data availability.

- **Secondary data:** The study utilizes secondary data sourced from the National Stock Exchange (NSE) Directory. While secondary data provides a valuable and accessible resource for analysis, it also comes with certain limitations. The accuracy and completeness of the data depend on the original sources. Any errors or omissions in the NSE Directory could affect the findings of this study. The research focuses on companies listed on the NSE, which primarily includes firms operating in India. Therefore, the findings may not be applicable to firms in other countries with different regulatory environments and market conditions.

- **Lack of Control Over Data Collection:** Since the data was collected by external entities, the researcher has no control over the data collection process, which may introduce biases or inconsistencies. Access to consistent and accurate financial data for all NIFTY companies can be a challenge. Missing or incomplete data can lead to biased results and limit the study's reliability.

- **Sample size:** The study is restricted to a sample of 85 companies. While this sample size is sufficient for certain analyses, it may not fully represent the entire population of firms listed on the NSE. Consequently, the findings may not be generalizable to all companies. Over time, market conditions, regulatory environments, and economic factors change. This sample size of 85 companies may not fully capture these dynamics, making it harder to account for temporal variations. Different companies and sectors are affected differently by economic cycles. A smaller sample may not adequately represent these cyclical variations, affecting the study's conclusions.

- **Time Period:** The choice of the time-period for the study can impact the results. Economic conditions, regulatory changes, and market dynamics vary over time, affecting capital structure decisions. The research covers a fourteen-year period. Although this duration allows for the observation of trends and patterns over time, it may not capture long-term effects or changes that occur beyond this period. Additionally, any significant events or economic shifts occurring outside this timeframe are not considered in the analysis. While longer time period provides the bases for robust analysis it also comes with certain limitations. Over 14 years, economies go through various cycles of growth, recession, and recovery. These fluctuations can significantly impact companies' capital structures, making it difficult to attribute changes to specific strategies or policies. Technological advancements can change business models and financing needs. For instance, the rise of fintech and digital transformation can alter capital requirements and financing strategies. Companies that have gone bankrupt or been acquired during the period may not be included in the study, potentially skewing the results.
- **Heterogeneity**: NIFTY sector companies span various industries, each with unique financial characteristics and capital structure norms. This heterogeneity can complicate the analysis and make it challenging to draw general conclusions. Different industries have varying risk profiles, growth opportunities, and financing needs. These industry-specific factors can affect capital structure and may not be fully captured in a broad study. Companies across various industries have distinct financial needs and capital structures. A technology firm might rely heavily on equity to finance innovation, while a manufacturing company might use more debt for capital-intensive projects. The risks associated with each industry vary significantly. The consumer goods companies might face different market risks compared to energy or metal firms. These variations affect capital structure decisions. Growth prospects and capital requirements differ widely among industries. High-growth sectors like pharmaceuticals might prefer equity to avoid debt burdens, whereas stable sectors like utilities might use more debt. Collecting consistent and comparable

data across diverse industries can be difficult. Inconsistent data can skew analysis and conclusions.

- **Other factors**: Factors such as changes in government policies, interest rates, and global economic conditions can influence capital structure decisions. Isolating the impact of these external factors can be difficult. Investor sentiment and market conditions can influence capital structure decisions. These subjective factors are difficult to quantify and incorporate into the analysis. Changes in regulatory policies and compliance requirements can impact capital structure decisions. Keeping up with these changes and understanding their implications can be challenging.

5.4. Recommendations for Future Research

The study on the cost of capital and capital structure of NIFTY companies from 2010-2024 offers significant insights that can benefit a wide range of stakeholders. This research not only contributes to academic knowledge but also has practical implications for the financial industry and broader economy.

Companies should aim to find a balance between debt and equity to minimize the cost of capital while maximizing firm value. This involves regular assessment and adjustment of their capital structure based on market conditions and company performance. Sector-specific analysis conduct in-depth studies focused on individual sectors within the Nifty index. Each sector has unique characteristics, risk profiles, and capital requirements that influence optimal capital structure decisions. Tailored studies can provide more relevant and actionable insights. Time-Series Analysis can be performed in future to understand how the capital structure evolves over different economic cycles. This can help identify patterns and the impact of macroeconomic factors on capital structure decisions. The comparative study of the capital structure of Nifty companies with those in other major stock indices globally can be undertaken. This can help highlight differences and commonalities that may be influenced by regional regulations, market conditions, and industry practices. The corporate governance study can also be taken up in this direction to understand the role of

corporate governance in shaping the capital structure. This will assess the governance practices, board composition, and ownership structures impact on financing decisions in the pursuit of an optimal capital structure. Policymakers should consider creating guidelines that encourage companies to maintain a healthy balance between debt and equity, promoting financial stability and growth. Firms should implement robust risk management strategies to mitigate the risks associated with high levels of debt, such as interest rate fluctuations and economic downturns. Companies should enhance transparency and communication with investors regarding their capital structure decisions and the rationale behind them. This can build investor confidence and potentially lower the cost of equity. By understanding the determinants of capital structure and their impact on the cost of capital, companies can achieve financial efficiency and stability, investors can make better decisions, and policymakers can create supportive regulatory environments. Future research can explore how macroeconomic variables like inflation, interest rates, and economic growth influence the cost of capital and capital structure decisions of the firm. Investigating how advancements in financial technology (FinTech) influence capital structure decisions and the cost of capital could be a valuable area of research. Incorporating primary data collection can also be considered as it can add value in the study from the insights received by the industry people. Future studies can aim to expand the sample size and extend the study period which can also enhance the robustness and generalizability of the findings.

REFERENCES

- Abor, J. (2005). The effect of capital structure on profitability: an empirical analysis of listed firms in Ghana. *The Journal of Risk Finance, 6*(5), 438-445.
- Abor, J., & Biekpe, N. (2009). How do we explain the capital structure of SMEs in sub-Saharan Africa? Evidence from Ghana. *Journal of economic studies, 36*(1), 83-97.
- Agyei-Boapeah, H., Osei, D., & Franco, M. (2019). Leverage deviations and acquisition probability in the UK: The moderating effect of firms' internal capabilities and deal diversification potential. *European Management Review, 16*(4), 1059-1077.
- Ahmad, T. (2014). Impact of capital structure on profitability: an empirical analysis of cement sector of Pakistan. Research *Journal of Finance and Accounting, 5*(17), 49-54.
- Al-Fayoumi, N. A., & Abuzayed, B. M. (2009). Ownership structure and corporate financing. *Applied Financial Economics, 19*(24), 1975-1986.
- Aljamaan, B. E. (2018). Capital structure: Definitions, determinants, theories and link with performance literature review. *European Journal of Accounting, Auditing and Finance Research, 6*(2), 49-72.
- Al-Najjar, B., & Taylor, P. (2008). The relationship between capital structure and ownership structure: New evidence from Jordanian panel data. *Managerial Finance, 34*(12), 919-933.
- Amidu, M. (2007). Determinants of capital structure of banks in Ghana: an empirical approach. *Baltic journal of management, 2*(1), 67-79.
- Anderson, R. W., & Carverhill, A. (2012). Corporate liquidity and capital structure. *The Review of Financial Studies, 25*(3), 797-837.

- Antoniou, A., Guney, Y., & Paudyal, K. (2008). The determinants of capital structure: capital market-oriented versus bank-oriented institutions. J*ournal of financial and quantitative analysis, 43*(1), 59-92.
- Bajaj, Y., Kashiramka, S., & Singh, S. (2021). Application of capital structure theories: a systematic review. *Journal of Advances in Management Research, 18*(2), 173-199.
- Baker, M. and Wurgler, R. (2002). Market Timing and Capital Structure. *Journal of Finance, 57*, 1-32.
- Barclay, M. J., & Smith Jr, C. W. (1999). The capital structure puzzle: another look at the evidence. *Journal of Applied Corporate Finance, 12*(1), 8-20.
- Barges, A. (1962). The Effect of Capital Structure on the Cost of Capital. *The Journal of Finance, 17*(3), 548-550.
- Ben-Shahar, H. (1968). The capital structure and the cost of capital: a suggested exposition. *The Journal of Finance, 23*(4), 639-653.
- Berens, J. L., & Cuny, C. J. (1995). The capital structure puzzle revisited. *The Review of Financial Studies, 8*(4), 1185-1208.
- Bierman, H. (1993). Capital budgeting in 1992: a survey. *Financial Management, 22*(3), 24-24.
- Booth, L., Aivazian, V., Demirguc-Kunt, A., & Maksimovic, V. (2001). Capital structures in developing countries. *The Journal of Finance, 56*(1), 87-130.
- Brusov, P., & Filatova, T. (2023). Capital structure theory: Past, present, future. *Mathematics, 11*(3), 616.
- Cassar, G., & Holmes, S. (2003). Capital structure and financing of SMEs: Australian evidence. *Accounting & Finance, 43*(2), 123-147.

- Chadha, S., & Sharma, A. K. (2015). Determinants of capital structure: an empirical evaluation from India. *Journal of Advances in Management Research, 12*(1), 3-14.
- Chaklader, B., & Chawla, D. (2016). A study of determinants of capital structure through panel data analysis of firms listed in NSE CNX 500. *Vision, 20*(4), 267-277.
- Chakrabarti, A., & Chakrabarti, A. (2019). The capital structure puzzle–evidence from Indian energy sector. *International Journal of Energy Sector Management, 13*(1), 2-23.
- Chawla, D., & Sodhi, N. (2011). Research methodology: Concepts and cases. Vikas Publishing House. https://books.google.com/books?hl=en&lr=&id=MjxDDAAAQBAJ&oi=fnd&pg=PR7&dq=research+methodology&ots=ucfT81HwrP&sig=s21bdB7UjhRhzCSARCJLBEKQwQ0
- Chen, J. J. (2004). Determinants of capital structure of Chinese-listed companies. *Journal of Business Research, 57*(12), 1341-1351.
- Chen, P. (2023). Research on Debt Financing Strategy of New Energy Vehicle Enterprises: Taking BYD Company as an Example. Highlights in Business, *Economics and Management, 8*, 296-308.
- Chiang, Y. H., Cheng, E. W., & Lam, P. T. (2010). Epistemology of capital structure decisions by building contractors in Hong Kong. *Construction Innovation, 10*(3), 329-345.
- Chittenden, F., Hall, G., & Hutchinson, P. (1996). Small firm growth, access to capital markets and financial structure: Review of issues and an empirical investigation. *Small business economics, 8,* 59-67
- Cvijanović, D. (2014). Real estate prices and firm capital structure. *The Review of Financial Studies, 27*(9), 2690-2735.

- Dakua, S. (2019). Effect of determinants on financial leverage in I ndian steel industry: A study on capital structure. *International Journal of Finance & Economics, 24*(1), 427-436.
- De Jong, A., & Van Dijk, R. (2007). Determinants of leverage and agency problems: A regression approach with survey data. *The European Journal of Finance, 13*(6), 565-593.
- DeAngelo, H., & Masulis, R. W. (1980). Optimal capital structure under corporate and personal taxation. *Journal of financial economics, 8*(1), 3-29.
- Deesomsak, R., Paudyal, K., & Pescetto, G. (2004). The determinants of capital structure: evidence from the Asia Pacific region. *Journal of Multinational Financial Management, 14*(4-5), 387-405.
- Deloof, M., & Van Overfelt, W. (2008). Were modern capital structure theories valid in Belgium before World War I?. *Journal of Business Finance & Accounting, 35*(3-4), 491-515.
- Dittmar, A., & Mahrt-Smith, J. (2007). Corporate governance and the value of cash holdings. *Journal of financial economics, 83*(3), 599-634.
- Dobrowolski, Z., Drozdowski, G., Panait, M., & Babczuk, A. (2022). Can the economic value added Be used as the universal financial metric? *Sustainability,* 14, 2967.
- Driffield, N., Mahambare, V., & Pal, S. (2007). How does ownership structure affect capital structure and firm value? Recent evidence from East Asia. *Economics of transition, 15*(3), 535-573.
- Du, J., & Dai, Y. (2005). Ultimate corporate ownership structures and capital structures: Evidence from East Asian economies. *Corporate Governance: An International Review, 13*(1), 60-71.

- Durand, D. (1952, January). Costs of debt and equity funds for business: trends and problems of measurement. In Conference on research in business finance (pp. 215-262). NBER.
- Ebeh Ezeoha, A. (2011). Firm versus industry financing structures in Nigeria. *African Journal of Economic and Management Studies, 2*(1), 42-55.
- Eriotis, N., Vasiliou, D., & Ventoura-Neokosmidi, Z. (2007). How firm characteristics affect capital structure: an empirical study. *Managerial finance, 33*(5), 321-331.
- Fama, E. F., & French, K. R. (2002). Testing trade-off and pecking order predictions about dividends and debt. *Review of financial studies*, 1-33.
- Feng, Z., & Hardin III, W. G. (2023). Investment and Capital Improvements in Commercial Real Estate: The Case of REITs. *The Journal of Real Estate Finance and Economics*, 1-32.
- Fischer, EO, Heinkel, R & Zechner, J. (1989). 'Dynamic capital structure choice: theory and tests', *The Journal of Finance, 44*(1), 19-40.
- Frank, M. Z., & Goyal, V. K. (2003). Testing the pecking order theory of capital structure. *Journal of financial economics, 67*(2), 217-248.
- Fukui, T., Mitton, T., & Schonlau, R. (2023). Determinants of capital structure: An expanded assessment. *Journal of Financial and Quantitative Analysis, 58*(6), 2446-2488.
- Ghardallou, W. (2022). Capital structure decisions and corporate performance: does firm's profitability matter?. *Journal of Scientific & Industrial Research, 81*(08), 859-865.
- Ghosh, C., & Petrova, M. T. (2017). The impact of capital expenditures on property performance in commercial real estate. *The Journal of Real Estate Finance and Economics, 55,* 106-133.

- Gitman, L. J., & Mercurio, V. A. (1982). Cost of capital techniques used by major US firms: Survey and analysis of Fortune's 1000. *Financial management*, 21-29.
- González, V. M., & González, F. (2012). Firm size and capital structure: Evidence using dynamic panel data. *Applied Economics, 44*(36), 4745-4754.
- Gordon, M. J. (1967). Some estimates of the cost of capital to the electric utility industry, 1954-57: Comment. *The American Economic Review, 57*(5), 1267-1278.
- Graham, J. R. (1996). Debt and the marginal tax rate. *Journal of financial Economics, 41*(1), 41-73.
- Graham, J. R., & Harvey, C. R. (2001). The theory and practice of corporate finance: Evidence from the field. *Journal of financial economics, 60*(2-3), 187-243.
- Gujarati, D. and Sangeetha, N. (2007) Basic Econometrics. Fourth Edition, Tata McGraw-Hill, New Delhi.
- Gupta, M. C. (1969). The effect of size, growth, and industry on the financial structure of manufacturing companies. *The Journal of Finance, 24*(3), 517-529.
- Handoo, A., & Sharma, K. (2014). A study on determinants of capital structure in India. *IIMB Management review, 26*(3), 170-182.
- Harris, M., & Raviv, A. (1991). The theory of capital structure. *The Journal of Finance, 46*(1), 297-355.
- Heshmati, A. (2001). *The dynamics of capital structure: Evidence from Swedish micro and small firms (No. 0440)*. Stockholm School of Economics.
- Hirshleifer, J. (1964). Efficient allocation of capital in an uncertain world. *The American Economic Review, 54*(3), 77-85.

- Hoque, H., & Pour, E. K. (2018). Bank-level and country-level determinants of bank capital structure and funding sources. *International Journal of Finance & Economics, 23*(4), 504-532.
- Hossain, M. S. (2021). A revisit of capital structure puzzle: Global evidence and analysis. *International Review of Economics & Finance, 75,* 657-678.
- Hovakimian, A. (2004). The role of target leverage in security issues and repurchases. *The Journal of Business, 77*(4), 1041-1072.
- Huang, G. (2006). The determinants of capital structure: Evidence from China. *China economic review, 17*(1), 14-36.
- Iacobucci, D. (2010). Structural equations modeling: Fit indices, sample size, and advanced topics. *Journal of Consumer Psychology, 20*(1), 90–98.
- Jairo, I. (2008). The use of structural equation modelling (SEM) in capital structure empirical analysis. *KCA Journal of Business Management, 1(*1).
- Jaworski, J., & Czerwonka, L. (2022). Which determinants matter for working capital management in energy industry? The case of European Union economy. *Energies, 15*(9), 3030.
- Jensen, M. C. (1986). Agency costs of free cash flow, corporate finance and takeovers. *American Economic Review*.
- Jensen, M. C. (1996). Agency costs of free cash flow, corporate finance, and takeovers. *Corporate bankruptcy, 76*(2), 11-16.
- Jensen, M. C., & Meckling, W. H. (2019). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Corporate governance,* 77-132.
- Karadeniz, E., Yilmaz Kandir, S., Balcilar, M., & Beyazit Onal, Y. (2009). Determinants of capital structure: evidence from Turkish lodging companies. *International Journal of Contemporary Hospitality Management, 21*(5), 594-609.

- Khan, M. and Jain, P. (2014), *Financial Management- Text, Problems and Cases*, McGraw Hill Education (India) Private Limited, New Delhi, Vol. 7.
- Kraus, A., & Litzenberger, R. H. (1973). A state-preference model of optimal financial leverage. *The Journal of Finance, 28*(4), 911-922.
- Kulikov, A., Alabed Alkader, N., Panaedova, G., Ogorodnikov, A., & Rebeka, E. (2023). Modelling Optimal Capital Structure in Gas and Oil Sector by Applying Simulation Theory and Programming Language of Python (Qatar Gas Transport Company). *Energies, 16*(10), 4067.
- Kumar, R. (2011). *Research methodology*. London: SAGE publications. http://222.254.35.8/handle/TLU/6310
- Kurshev, A., & Strebulaev, I. A. (2015). Firm size and capital structure. *Quarterly Journal of Finance, 5*(03), 1550008.
- Lasfer, M. A. (1999). *Debt structure, agency costs and firm's size: An empirical investigation*. City University, Business School.
- Lee, I., Lochhead, S., Ritter, J., & Zhao, Q. (1996). The costs of raising capital. *Journal of Financial Research, 19*(1), 59-74.
- Leland, H. E., & Pyle, D. H. (1977). Informational asymmetries, financial structure, and financial intermediation. *The Journal of Finance, 32*(2), 371-387.
- Lemmon, M. L., & Zender, J. F. (2010). Debt capacity and tests of capital structure theories. *Journal of financial and quantitative analysis, 45*(5), 1161-1187.
- Li, H., & Stathis, P. (2017). Determinants of capital structure in Australia: an analysis of important factors. *Managerial Finance, 43*(8), 881-897.
- Li, L., & Islam, S. Z. (2019). Firm and industry specific determinants of capital structure: Evidence from the Australian market. *International Review of Economics & Finance, 59*, 425-437.

- Lious, N. A., Cecilio, H. G., & Felix, P. G. (2016). Capital structure determinants: Evidence from Spanish listed firms. *Corporate Ownership & Control*, 13-4.
- Lipson, M. L., & Mortal, S. (2009). Liquidity and capital structure. *Journal of financial markets, 12*(4), 611-644.
- Marsh, P. (1982). The choice between equity and debt: An empirical study. *The Journal of finance, 37*(1), 121-144.
- Mazanec, J. (2023). Capital Structure Theory in the Transport Sector: Evidence from Visegrad Group. *Mathematics, 11*(6), 1343.
- Mishra, S. B., & Alok, S. (2011). *Handbook of research methodology*. http://61.2.46.60:8088/jspui/bitstream/123456789/1034/1/BookResearchMethodology.pdf
- Mitra, A., & Mordani, K. (2012). Equity Research in FMCG Sector (F & B) in India: A Study of KRBL Limited and Britannia Industries. *The Management Accountant, 47*(12), 1446-1458.
- Mitton, T. (2008). Why have debt ratios increased for firms in emerging markets?. *European Financial Management, 14*(1), 127-151.
- Modigliani, F., & Miller, M. H. (1958). The cost of capital, corporation finance and the theory of investment. *The American economic review, 48*(3), 261-297.
- Modigliani, F., & Miller, M. H. (1963). Corporate income taxes and the cost of capital: a correction. *The American economic review, 53*(3), 433-443.
- Molwus, J. J., Erdogan, B., & Ogunlana, S. O. (2013). Sample Size and Model Fit Indices for Structural Equation Modelling (SEM): The Case of Construction Management Research. ICCREM 2013, 338–347. https://doi.org/10.1061/9780784413135.032

- Moore, J. S., & Reichert, A. K. (1983). An analysis of the financial management techniques currently employed by large US corporations. *Journal of Business Finance & Accounting, 10*(4), 623-645.
- Myers, S. C. (1977). Determinants of corporate borrowing. *Journal of financial economics, 5*(2), 147-175.
- Myers, S. C. (2001). Capital structure. *Journal of Economic perspectives, 15*(2), 81-102.
- Myers, S. C., & Majluf, N. S. (1984). Corporate Financing and Investment Decisions When Firms have Information that Investors do not have. *Journal of Financial Economics, 13*, 187-221.
- Myers, Stewart C. 1984. The Capital Structure Puzzle. *Journal of Finance. 39*(3), 575–92.
- Ooi, J. (1999). The determinants of capital structure evidence on UK property companies. *Journal of Property Investment & Finance, 17*(5), 464-480.
- Ørngreen, R., & Levinsen, K. T. (2017). Workshops as a research methodology. *Electronic Journal of E-Learning, 15*(1), 70–81.
- Pandey, I.M., *The Cost of Capital and Capital Structure*, Vikas Publishing House, New Delhi, 1981.
- PANNEERSELVAM, R. (2014). Research methodology. PHI Learning Pvt. Ltd. https://books.google.com/books?hl=en&lr=&id=-pBeBAAAQBAJ&oi=fnd&pg=PP1&dq=research+methodology&ots=W38xz-0fNt&sig=bfU4EoWD3-9hHZp_R-ahKvsOVJE
- Parsons, C., & Titman, S. (2009). Empirical capital structure: A review. *Foundations and Trends® in Finance, 3*(1), 1-93.

- Rajagopal, S. (2011). The portability of capital structure theory: Do traditional models fit in an emerging economy?. *Journal of Finance and Accountancy, 5*, 1.
- Rajan, R. G., & Zingales, L. (1995). What do we know about capital structure? Some evidence from international data. *The Journal of Finance, 50*(5), 1421-1460
- Rampini, A. A., & Viswanathan, S. (2013). Collateral and capital structure. *Journal of Financial Economics, 109*(2), 466-492.
- Rao, C. U., & Litzenberger, R. H. (1971). Leverage and the cost of capital in a less developed capital market: Comment. *The Journal of Finance, 26*(3), 777-782.
- Robichek, A. A., & Myers, S. C. (1966). Problems in the theory of optimal capital structure. *Journal of Financial and Quantitative Analysis, 1*(2), 1-35.
- Sarma, L. V. L. N., & Rao, K. H. (1969). Leverage and the Value of the Firm. *The Journal of Finance*, 673-677.
- Saunders M, Lewis P and Thornhill A. (2019). *Research methods for business students.* Eighth edition. London: Pearson.
- Schwartz, E., & Aronson, J. R. (1967). Some surrogate evidence in support of the concept of optimal financial structure. *The Journal of Finance, 22*(1), 10-18.
- Shahzad, A., Azeem, M., Nazir, M. S., Vo, X. V., & Linh, N. T. (2021). The determinants of capital structure: Evidence from SAARC countries. *International Journal of Finance & Economics, 26*(4), 6471-6487.
- Sheikh, N. A., & Wang, Z. (2011). Determinants of capital structure: An empirical study of firms in manufacturing industry of Pakistan. *Managerial finance, 37*(2), 117-133.

- Snyder, H. (2019). Literature review as a research methodology: An overview and guidelines. *Journal of Business Research, 104*, 333–339.
- Sogorb-Mira, F. (2005). How SME uniqueness affects capital structure: Evidence from a 1994–1998 Spanish data panel. *Small business economics, 25*, 447-457.
- Suto, M. (2003). Capital structure and investment behaviour of Malaysian firms in the 1990s: A study of corporate governance before the crisis. *Corporate Governance: An International Review, 11*(1), 25-39.
- Synn, C., & Williams, C. D. (2024). Financial reporting quality and optimal capital structure. *Journal of Business Finance & Accounting, 51*(5-6), 885-910.
- Tang, S., Qi, S., & Zhou, C. (2023). Impact of dual control system of energy consumption and intensity on cost of debt financing: micro-evidence from Chinese listed companies. *Environmental Science and Pollution Research, 30*(19), 56969-56983.
- Teker, D., Tasseven, O., & Tukel, A. (2009). Determinants of capital structure for Turkish firms: A panel data analysis. *International Research Journal of Finance and Economics, 29*, 179-187.
- Titman, S., & Wessels, R. (1988). The determinants of capital structure choice. *The Journal of finance, 43*(1), 1-19.
- Trahan, E. A., & Gitman, L. J. (1995). Bridging the theory-practice gap in corporate finance: a survey of chief financial officers. *The Quarterly Review of Economics and Finance, 35*(1), 73-87.
- Tse, A. S. (2020). Dividend policy and capital structure of a defaultable firm. *Mathematical Finance, 30*(3), 961-994.

- Viviani, J. L. (2008). Capital structure determinants: an empirical study of French companies in the wine industry. *International journal of wine business research, 20*(2), 171-194.
- Ward, C. (1999). Estimating the cost of capital. *Journal of Corporate Real Estate, 1*(3), 287-293.
- West, S. G., Taylor, A. B., & Wu, W. (2012). Model fit and model selection in structural equation modeling. Handbook of Structural Equation Modeling, 1, 209–231.
- Weston, J. F. (1963). A test of cost of capital propositions. *Southern Economic Journal*, 105-112.
- Yang, H., Lee, K., & Lim, S. (2022). A comparative study of the determinants of capital structure in shipping companies: the case of Korea and Greece. *Maritime Policy & Management, 49*(4), 528-539.
- Yu, D. D., & Aquino, R. Q. (2009). Testing capital structure models on Philippine listed firms. *Applied Economics, 41*(15), 1973-1990.

Appendix I

Details of the Sample Study

TABLE 1: NIFTY AUTO

S. No.	Company Name	Industry	Symbol	Series	ISIN Code
1	**Amara Raja Batteries Limited**	Automobile and Auto Components	ARE&M	EQ	INE885A01032
2	**Apollo Tyres Ltd.**	Automobile and Auto Components	APOLLOTYRE	EQ	INE438A01022
3	**Ashok Leyland Ltd.**	Capital Goods	ASHOKLEY	EQ	INE208A01029
4	**Bajaj Auto Ltd.**	Automobile and Auto Components	BAJAJ-AUTO	EQ	INE917I01010
5	**Bharat Forge Ltd.**	Automobile and Auto Components	BHARATFORG	EQ	INE465A01025
6	**Bosch Ltd.**	Automobile and Auto Components	BOSCHLTD	EQ	INE323A01026
7	**Eicher Motors Ltd.**	Automobile and Auto Components	EICHERMOT	EQ	INE066A01021
8	**Exide Industries Ltd.**	Automobile and Auto Components	EXIDEIND	EQ	INE302A01020

9	**Hero MotoCorp Ltd.**	Automobile and Auto Components	HEROMOTOCO	EQ	INE158A01026
10	**Mahindra & Mahindra Ltd.**	Automobile and Auto Components	M&M	EQ	INE101A01026
11	**Maruti Suzuki India Ltd.**	Automobile and Auto Components	MARUTI	EQ	INE585B01010
12	**MRF Ltd.**	Automobile and Auto Components	MRF	EQ	INE883A01011
13	**Tata Motors Ltd.**	Automobile and Auto Components	TATAMOTORS	EQ	INE155A01022
14	**TVS Motor Company Ltd.**	Automobile and Auto Components	TVSMOTOR	EQ	INE494B01023

TABLE 2: NIFTY ENERGY

S. No.	Company Name	Industry	Symbol	Series	ISIN Code
1	**Bharat Petroleum Corporation Ltd.**	Oil Gas & Consumable Fuels	BPCL	EQ	INE029A01011
2	**GAIL (India) Ltd.**	Oil Gas & Consumable Fuels	GAIL	EQ	INE129A01019
3	**Hindustan Petroleum Corporation Ltd.**	Oil Gas & Consumable Fuels	HINDPETRO	EQ	INE094A01015
4	**Indian Oil Corporation Ltd.**	Oil Gas & Consumable Fuels	IOC	EQ	INE242A01010
5	**NTPC Limited**	Oil Gas & Consumable Fuels	NTPC	EQ	INE733E01010
6	**Oil & Natural Gas Corporation Ltd.**	Oil Gas & Consumable Fuels	ONGC	EQ	INE213A01029
7	**Power Grid Corporation of India Limited**	Oil Gas & Consumable Fuels	POWERGRID	EQ	INE752E01010
8	**Reliance Industries Ltd.**	Oil Gas & Consumable Fuels	RELIANCE	EQ	INE002A01018
9	**Tata Power Company Limited**	Oil Gas & Consumable Fuels	TATAPOWER	EQ	INE245A01021

TABLE 3: NIFTY FMCG

S. No.	Company Name	Industry	Symbol	Series	ISIN Code
1	**Britannia Industries Ltd.**	Fast Moving Consumer Goods	BRITANNIA	EQ	INE216A01030
2	**Colgate Palmolive (India) Ltd.**	Fast Moving Consumer Goods	COLPAL	EQ	INE259A01022
3	**Dabur India Ltd.**	Fast Moving Consumer Goods	DABUR	EQ	INE016A01026
4	**Emami Limited**	Fast Moving Consumer Goods	EMAMI	EQ	INE548C01032
5	**Godrej Consumer Products Ltd.**	Fast Moving Consumer Goods	GODREJCP	EQ	INE102D01028
6	**Godrej Industries Limited**	Fast Moving Consumer Goods	GODREJIND	EQ	INE233A01035
7	**Hindustan Unilever Ltd.**	Fast Moving Consumer Goods	HINDUNILVR	EQ	INE030A01027
8	**ITC Ltd.**	Fast Moving Consumer Goods	ITC	EQ	INE154A01025
9	**Jubilant Foodworks Limited**	Fast Moving Consumer Goods	JUBLFOOD	EQ	INE797F01020

10	**Nestle India Ltd.**	Fast Moving Consumer Goods	NESTLEIND	EQ	INE239A01024
11	**Tata Consumer Products Ltd.**	Fast Moving Consumer Goods	TATACONSUM	EQ	INE192A01025
12	**United Breweries Ltd.**	Fast Moving Consumer Goods	UBL	EQ	INE686F01025
13	**United Spirits Ltd.**	Fast Moving Consumer Goods	UNITDSPR	EQ	INE854D01024

TABLE 4: NIFTY IT

S. No.	Company Name	Industry	Symbol	Series	ISIN Code
1	**HCL Technologies Ltd.**	Information Technology	HCLTECH	EQ	INE860A01027
2	**Infosys Ltd.**	Information Technology	INFY	EQ	INE009A01021
3	**Tata Consultancy Services Ltd.**	Information Technology	TCS	EQ	INE467B01029
4	**Tata Elxsi Limited**	Information Technology	TATAELXSI	EQ	INE670A01012
5	**Tech Mahindra Ltd.**	Information Technology	TECHM	EQ	INE669C01036
6	**Wipro Ltd.**	Information Technology	WIPRO	EQ	INE075A01022

TABLE 5: NIFTY MEDIA

S. No.	Company Name	Industry	Symbol	Series	ISIN Code
1	**Balaji Telefilms Limited**	Media Entertainment & Publication	BALAJITELE	EQ	INE794B01026
2	**Dish TV India Ltd.**	Media Entertainment & Publication	DISHTV	EQ	INE836F01026
3	**Jagran Prakashan Limited**	Media Entertainment & Publication	JAGRAN	EQ	INE199G01027
4	**Network18 Media & Investments Ltd.**	Media Entertainment & Publication	NETWORK18	EQ	INE870H01013
5	**PVR INOX Ltd.**	Media Entertainment & Publication	PVRINOX	EQ	INE191H01014
6	**Saregama India Ltd**	Media Entertainment & Publication	SAREGAMA	EQ	INE979A01025
7	**Sun TV Network Ltd.**	Media Entertainment & Publication	SUNTV	EQ	INE424H01027
8	**TV Today Network Limited**	Media Entertainment & Publication	TVTODAY	EQ	INE038F01029
9	**TV18 Broadcast Limited**	Media Entertainment & Publication	TV18BRDCST	EQ	INE886H01027

10	**Zee Entertainment Enterprises Ltd.**	Media Entertainment & Publication	ZEEL	EQ	INE256A01028
11	**Zee Media Corporation Limited**	Media Entertainment & Publication	ZEEMEDIA	EQ	INE966H01019

TABLE 6: NIFTY METAL

S. No.	Company Name	Industry	Symbol	Series	ISIN Code
1	**APL Apollo Tubes Ltd.**	Capital Goods	APLAPOLLO	EQ	INE702C01027
2	**Coal India Limited**	Metals & Mining	COALINDIA	EQ	INE522F01014
3	**Hindalco Industries Ltd.**	Metals & Mining	HINDALCO	EQ	INE038A01020
4	**Hindustan Copper Ltd.**	Metals & Mining	HINDCOPPER	EQ	INE531E01026
5	**Hindustan Zinc Ltd.**	Metals & Mining	HINDZINC	EQ	INE267A01025
6	**Jindal Steel & Power Ltd.**	Metals & Mining	JINDALSTEL	EQ	INE749A01030
7	**JSW Steel Ltd.**	Metals & Mining	JSWSTEEL	EQ	INE019A01038
8	**MOIL Limited**	Metals & Mining	MOIL	EQ	INE490G01020
9	**National Aluminium Co. Ltd.**	Metals & Mining	NATIONALUM	EQ	INE139A01034
10	**Ratnamani Metals & Tubes Ltd.**	Capital Goods	RATNAMANI	EQ	INE703B01027
11	**Steel Authority of India Ltd.**	Metals & Mining	SAIL	EQ	INE114A01011
12	**Tata Steel Ltd.**	Metals & Mining	TATASTEEL	EQ	INE081A01020

13	**Vedanta Ltd.**	Metals & Mining	VEDL	EQ	INE205A01025
14	**Welspun Corp Ltd.**	Capital Goods	WELCORP	EQ	INE191B01025

TABLE 7: NIFTY PHARMA

S. No.	Company Name	Industry	Symbol	Series	ISIN Code
1	**Aurobindo Pharma Ltd.**	Healthcare	AUROPHARMA	EQ	INE406A01037
2	**Biocon Ltd.**	Healthcare	BIOCON	EQ	INE376G01013
3	**Cipla Ltd.**	Healthcare	CIPLA	EQ	INE059A01026
4	**Divi's Laboratories Ltd.**	Healthcare	DIVISLAB	EQ	INE361B01024
5	**Dr. Reddy's Laboratories Ltd.**	Healthcare	DRREDDY	EQ	INE089A01031
6	**Glenmark Pharmaceuticals Ltd.**	Healthcare	GLENMARK	EQ	INE935A01035
7	**Lupin Ltd.**	Healthcare	LUPIN	EQ	INE326A01037
8	**Piramal Enterprises Limited**	Healthcare	PPLPHARMA	EQ	INE0DK501011
9	**Sun Pharmaceutical Industries Ltd.**	Healthcare	SUNPHARMA	EQ	INE044A01036

TABLE 8: NIFTY REALTY

S. No.	Company Name	Industry	Symbol	Series	ISIN Code
1	**Brigade Enterprises Ltd.**	Realty	BRIGADE	EQ	INE791I01019
2	**DLF Ltd.**	Realty	DLF	EQ	INE271C01023
3	**Godrej Properties Ltd.**	Realty	GODREJPROP	EQ	INE484J01027
4	**Mahindra Lifespace Developers Ltd.**	Realty	MAHLIFE	EQ	INE813A01018
5	**Oberoi Realty Ltd.**	Realty	OBEROIRLTY	EQ	INE093I01010
6	**Prestige Estates Projects Ltd.**	Realty	PRESTIGE	EQ	INE811K01011
7	**Sobha Ltd.**	Realty	SOBHA	EQ	INE671H01015
8	**Sunteck Realty Limited**	Realty	SUNTECK	EQ	INE805D01034
9	**The Phoenix Mills Ltd.**	Realty	PHOENIXLTD	EQ	INE211B01039

Source : - www.nseindia.com

PUBLICATIONS :

1.Capital Structure Study: A Systematic Review and Bibliometric Analysis. https://doi.org/10.1177/09722629221130453 Published in *Vision: The Journal of Business Perspective*, Publisher: Sage in 2022

2.Exploring Sustainable Finance: A Review and Future Research Agenda. https://doi.org/10.1177/09722629231209177 Published in *Vision: The Journal of Business Perspective*, Publisher: Sage in 2023

3.Effect of Determinants on Financial Leverage in FMCG Industry: An Empirical Study of Capital Structure Prior to COVID-19. https://doi.org/10.1177/2319510X231178408 Published in *Asia-Pacific Journal of Management Research and Innovation*, Publisher: Sage in 2023

4.Book Chapter: Exploring Economic Development with Corporate Social Responsibility: A Review and Future Research Direction. ISBN: 978-81-19567-13-3. Published By: *Eureka Publications (A Division of EnTo Tech Pvt. Ltd.) in 2023.*

CONFERENCES AND FDPS

1. Presented Paper titled COVID-19 and Capital Structure of the Oil and Natural Gas Corporation Limited in International Management Conference 2021, Centre for Management Studies Jamia Millia Islamia, New Delhi, India. (Online mode)
2. Presented paper titled Determinants of the Capital Structure to Demonstrate Financing Pattern – A Determinants of the Capital Structure to Demonstrate Financing Pattern – An Empirical Study of NIFTY FMCG Companies in India Prior To COVID-19" in 6th International Conference on Business, Management and Economics (2022), Nice, France.
3. Presented Research paper titled Exploring Economic Development with Corporate Social Responsibility: A Review and Future Research Direction in Global Entrepreneurship & Management Summit 'AAROHAN-2023', ATLAS SKILL TECH UNIVERSITY. (Online mode)
4. Faculty Development Programme on "Advanced Financial Statement Analysis" at Indian Institute of Management, Kozhikode held on Nov 06-10, 2017.
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