

Corporate Taxation and Capital Structure: An Empirical Analysis of Tax Shields and Leverage in Selected Indian Listed Companies

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Abstract—This study examines the relationship between corporate taxation and capital structure among selected Indian listed companies, with particular emphasis on the role of tax benefits arising from debt financing. The study uses secondary financial data covering 10 selected non-financial Indian listed companies over five financial years from FY 2020–21 to FY 2024–25, resulting in 50 firm-year observations. Debt-to-Equity (D/E) Ratio is used as the primary measure of capital structure, while Effective Tax Rate (ETR) and Interest Tax Shield are considered the principal taxation-related variables. Return on Assets (ROA), Firm Size and Asset Tangibility are included as control variables. Descriptive statistics, Pearson correlation, Variance Inflation Factor (VIF), Pooled Ordinary Least Squares (Pooled OLS), Fixed Effects (FE) and Random Effects (RE) panel-data regression models are employed. The Hausman specification test is used to select the appropriate panel-data model, and company-clustered robust standard errors are applied to assess the stability of the results. The Random Effects model is identified as the preferred specification, with a Hausman test p-value of 0.1630. The model explains approximately 53.94% of the variation in the Debt-to-Equity Ratio. The Interest Tax Shield has a statistically significant positive relationship with leverage, whereas ETR does not show a statistically significant individual relationship. Firm Size also demonstrates a statistically significant positive relationship with leverage, while ROA and Tangibility remain statistically insignificant individually. The robustness analysis confirms that the main findings remain stable when company-clustered robust standard errors are applied. The findings suggest that tax-related benefits, particularly the Interest Tax Shield, and firm-specific characteristics such as Firm Size are associated with corporate leverage in the selected sample. However, the findings represent statistical associations and should not be interpreted as evidence of direct causality.

Index Terms—Corporate Taxation; Capital Structure; Interest Tax Shield; Effective Tax Rate; Financial Leverage; Indian Listed Companies.

I. INTRODUCTION

1.1 Background of the study

Corporate financing decisions are among the most important financial decisions made by business organizations. A company requires adequate funds to support its operations, undertake investments, expand its business and create value for shareholders. These funds can generally be raised through internal sources, equity financing and debt financing. The choice between debt and equity constitutes a firm's capital structure and has significant implications for its cost of capital, financial risk, profitability and overall value. Debt financing is an important source of external finance for companies because it enables firms to obtain funds without diluting the ownership interests of existing shareholders. However, debt also creates a fixed financial obligation in the form of interest and principal repayment. Therefore, excessive dependence on debt can increase financial risk and the possibility of financial distress.

One of the major factors that makes debt financing attractive to companies is its potential tax advantage. Interest paid on qualifying debt is generally treated as an expense for tax purposes, subject to applicable tax laws and limitations. This reduces the taxable income of a company and consequently lowers its tax liability. The reduction in tax liability arising from deductible interest payments is commonly referred to as the interest tax shield.

The relationship between taxation and capital structure has been widely discussed in corporate finance. The

traditional view suggests that the tax deductibility of interest provides an incentive for companies to use debt financing. However, the decision to increase debt is not based solely on tax considerations. Companies also consider profitability, business risk, asset structure, firm size, growth opportunities, liquidity and the potential costs associated with financial distress.

In the Indian corporate environment, listed companies operate across diverse sectors and differ considerably in their financing patterns, profitability and tax positions. Therefore, examining the relationship between corporate tax benefits and capital structure provides useful insights into how taxation may influence corporate financing decisions.

This study focuses on selected Indian listed companies and examines whether the tax benefits associated with debt financing are related to their capital structure decisions. The study also considers other important firm-level factors such as profitability, firm size and asset tangibility in order to obtain a broader understanding of corporate debt financing decisions.

1.2 Corporate Taxation

Corporate taxation refers to the taxes imposed by the government on the income or profits earned by companies. Corporate income tax represents an important component of the business environment because it directly affects the amount of profit available to a company after taxation. Consequently, taxation can influence various corporate decisions, including investment, dividend distribution, financing and capital structure decisions.

The tax treatment of different sources of finance can have different implications for companies. One important feature of debt financing is that interest expenses may be deductible from taxable income, subject to applicable tax provisions. As a result, a company that uses debt may experience a lower tax liability compared with a similar company that relies entirely on equity financing.

For example, when a company incurs interest expenses on borrowed funds, the deductible portion of the interest reduces taxable income. This creates a tax saving for the company. The resulting benefit is known as the interest tax shield.

Corporate taxation therefore has an important connection with financing decisions. However, the existence of a tax advantage does not necessarily mean that companies should continuously increase their

debt. Higher levels of debt can increase interest obligations and financial risk. Consequently, companies must balance the tax benefits of debt against the potential costs associated with higher leverage.

1.3 Debt Financing

Debt financing refers to raising funds through borrowings that create an obligation for the company to repay the principal amount along with interest according to predetermined terms. Companies may obtain debt through bank loans, bonds, debentures, commercial borrowings and other forms of borrowing. Debt financing offers several potential advantages. First, it allows companies to raise funds without issuing additional equity shares and thereby avoids immediate dilution of ownership. Second, interest payments associated with qualifying debt may provide tax benefits. Third, debt can allow companies to undertake investments and expansion activities using external funds.

However, debt financing also involves financial risk. Unlike dividends, interest payments represent contractual obligations. Companies must continue to service their debt regardless of fluctuations in profitability. A high level of debt may therefore increase financial leverage and expose the company to greater financial distress.

The decision regarding the appropriate level of debt is consequently an important component of financial management. Companies need to determine a capital structure that provides adequate financing while maintaining an acceptable level of financial risk.

1.4 Interest Tax Shield

The interest tax shield represents the tax saving obtained because interest expenses on qualifying debt can reduce taxable income, subject to applicable tax rules and limitations.

The basic relationship can be expressed as:

$$\text{Interest Tax Shield} = \text{Interest Expense} \times \text{Effective Tax Rate}$$

For example, if a company incurs ₹100 crore of interest expense and its effective tax rate is 25%, the approximate tax benefit associated with the interest expense would be ₹25 crore.

The interest tax shield is one of the key theoretical reasons why debt financing may be preferred over equity financing. Since interest can reduce taxable

income, debt may effectively have a lower after-tax cost than it would have before considering taxation.

However, the actual tax benefit received by a company depends on several factors, including its taxable income, applicable tax provisions, interest expense and ability to utilise the available deduction. Therefore, the tax benefit associated with debt should be analysed along with other determinants of capital structure.

In this study, the interest tax shield is used as a measure of the potential tax benefit associated with debt financing. The study examines whether differences in this tax benefit are associated with differences in the debt levels of selected Indian listed companies.

1.5 Capital Structure

Capital structure refers to the composition of a company's financing, particularly the proportion of debt and equity used to finance its assets and operations. A company's capital structure decision determines how much of its financing is obtained through debt and how much through shareholders' funds.

The debt-to-equity ratio is one of the commonly used measures of capital structure. It indicates the relationship between debt and shareholders' equity.

Debt-to-Equity Ratio = Total Debt / Shareholders' Equity

A higher debt-to-equity ratio indicates greater reliance on debt relative to equity, while a lower ratio indicates relatively greater reliance on equity financing.

Another measure used in this study is the debt-to-assets ratio:

Debt-to-Assets Ratio = Total Debt / Total Assets

These measures help assess the degree of financial leverage maintained by a company. The capital structure decision is influenced by several factors, including taxation, profitability, firm size, asset tangibility, business risk and growth opportunities.

1.6 Problem Statement

The tax deductibility of interest creates a potential financial advantage for companies that use debt financing. This advantage may encourage companies to increase their reliance on debt in order to reduce their tax burden. However, excessive debt can simultaneously increase financial risk and debt-servicing obligations.

Therefore, an important issue for corporate financial managers is to determine whether the tax benefits associated with debt are sufficiently significant to influence capital structure decisions. Although taxation is theoretically considered an important determinant of financing decisions, companies may respond differently depending on their profitability, size, asset structure and sector.

In the Indian context, differences in corporate characteristics and financing practices make it relevant to examine the relationship between tax benefits and capital structure using recent company-level financial data.

The present study therefore seeks to empirically examine whether the tax benefits associated with debt financing are related to the capital structure of selected Indian listed companies. It also examines the role of profitability, firm size and asset tangibility in explaining differences in debt financing

II. REVIEW OF LITERATURE

1. Athira, A., & Lukose, P. J. J. (2024). *The increasing trend in effective tax rates in India: Role of macroeconomic factors, tax policy changes and firm characteristics. Journal of Emerging Market Finance*, 23(3), 279–305.

Overview & Methodology: The study examines two decades of firm-level data on Indian public and private companies, decomposing the drivers of effective tax rate (ETR) movements into firm characteristics, macroeconomic factors, and tax-policy shifts. It applies decomposition and panel-regression techniques to separate the permanent and temporary book-tax difference components of the ETR trend.

Key Findings: The authors show that over the last two decades, India's effective tax rates increased by 7.8 percent, which contrasts with the downward trend in ETRs documented for US firms. After controlling for changes in firm characteristics, macroeconomic factors, and tax policy changes, ETRs increased by 0.37 percent per year during the sample period. Critically for capital-structure research, the study finds a stronger upward trend in ETRs among private firms than public firms, consistent with the capital market pressure hypothesis, and identifies the permanent book-tax difference as the primary driver of the ETR trend for both public and private firms. This implies that Indian listed (public) firms face comparatively

mented tax-shield erosion relative to private peers, which has direct implications for the marginal value of debt tax shields used in trade-off-theory testing — public firms retain a stronger fiscal incentive to lever up than their private counterparts, a nuance largely absent from Western capital-structure literature.

2. Singh, K., Pillai, D., & Rastogi, S. (2025). *Pecking order theory of capital structure: Empirical evidence for listed SMEs in India. Vision, 29(1), 35–47.*

Overview & Methodology: Using panel data on 82 listed Indian SMEs from 2015–2019, the authors test the pecking order theory (POT) against alternative explanations using pooled OLS, fixed-effects (FE), and two-stage least squares (2SLS) regressions to correct for endogeneity in the non-debt tax shield variable.

Key Findings: The study's independent variables include profitability, liquidity, growth, tangibility and non-debt tax shield, with size as a control and financial leverage as the dependent variable. The pooled OLS and FE models were found to yield biased estimates due to endogeneity, and the 2SLS approach overcomes this endogeneity in the non-debt tax shield variable by using tangibility as an instrument. This methodological innovation is significant for tax-leverage research: it demonstrates that naïve OLS/FE estimates of the non-debt tax shield–leverage relationship in India are likely biased, and that instrumenting for tax-shield variables materially changes inference about whether Indian firms substitute non-debt tax shields (depreciation) for debt tax shields, as DeAngelo and Masulis's substitution hypothesis would predict.

3. Sinha, P., & Vodwal, S. (2022). *Impact of size and earnings on speed of partial adjustment to target leverage: A study of Indian companies using two-step system GMM. International Journal of System Assurance Engineering and Management, 13, 957–977.*

Overview & Methodology: The study uses a panel of 431 listed Indian non-financial firms from 2002–2017 and estimates a dynamic partial-adjustment model via two-step system GMM to compute firm-specific speeds of adjustment (SOA) toward target leverage.

Key Findings: The findings show that Indian firms bridge the gap between actual and target leverage at 41.3% per annum, with the speed of adjustment significantly impacted by firm size and profitability.

Large and highly profitable firms adjust their debt financing ratio at a higher speed (66.2%) compared with loss-making or small firms (58% and 46.5% respectively for small and average-profitability firms). Because trade-off theory predicts adjustment toward a target capital structure balancing the tax shield of debt against distress costs, this rapid and heterogeneous SOA offers strong dynamic support for trade-off theory in the Indian market, while also showing that the tax-benefit incentive to lever up is realized faster by financially flexible, profitable firms than by constrained ones.

4. Prakash, N., Maheshwari, A., & Hawaldar, A. (2023). *The impact of Covid-19 on the capital structure in emerging economies: Evidence from India. Asian Journal of Accounting Research, 8(3), 236–249.*

Overview & Methodology: Drawing on BSE500-listed Indian companies for 2015–2021, the study uses three leverage ratios (short-term, long-term, total) and a pre/post-pandemic dummy variable in panel regressions to isolate the pandemic's effect on financing choices.

Key Findings: The study utilizes short-term leverage ratio (STLR), long-term leverage ratio (LTLR) and total leverage ratio (TLR) for the period 2015–2021, with a dummy variable differentiating the pre-pandemic (2015–2019) and pandemic (2020–2021) periods. The results indicate that Indian firms deleveraged sharply during the shock, consistent with a trade-off-theory response in which the expected cost of financial distress rose relative to the tax benefit of debt, prompting firms to prioritize survival over tax-shield optimization. This is one of the few Indian studies to demonstrate that the trade-off between the tax shield and distress costs is not static but shifts materially under macroeconomic stress, a nuance essential for any term paper modeling tax-leverage relationships across business cycles.

5. Gulzar, I., & Haque, S. M. I. (2022). *Determining the key factors of corporate leverage in Indian manufacturing firms using dynamic modelling. Cogent Business & Management, 9(1), 2149145.*

Overview & Methodology: Using NSE 500 Indian manufacturing companies, the study specifies a partial-adjustment model and applies system GMM to estimate both the determinants of leverage and the speed of adjustment (SOA) to target capital structure,

incorporating both firm-specific and corporate-governance variables.

Key Findings: The results show that non-debt tax shield positively affects SOA, whereas growth, tangibility and firm size negatively influence SOA, while board size, board independence, ownership concentration and the corporate governance index all positively influence SOA. The paper further confirms that it takes around 2.65 years for Indian manufacturing firms to offset half of the gap between current and target leverage. The positive (rather than substitutive) relationship between non-debt tax shields and adjustment speed is a noteworthy departure from the classical DeAngelo-Masulis substitution hypothesis, suggesting that in India, firms with higher non-debt tax shields (e.g., through accelerated depreciation) may be larger, more established firms that also have superior access to debt markets — meaning tax-shield availability and debt capacity move together rather than as substitutes.

6. Thayyib, P. V. (2025). *Firm-specific determinants influencing tax avoidance among Indian multinational corporations: A panel regression approach*. *Cogent Economics & Finance*, 13(1), 2483869.

Overview & Methodology: The study analyzes profitable Nifty 500 Indian multinational corporations (excluding COVID-affected years) using panel regression to link firm-specific determinants — including leverage — to effective tax rate (ETR) and book-tax difference (BTD) measures of tax avoidance, explicitly evaluating the effect of the 2019 statutory tax cut.

Key Findings: The tax-haven nexus significantly amplified BTD, indicating that MNCs prefer permanent difference-based tax-base avoidance strategies; surprisingly, leverage and capital intensity did not reduce ETRs, while leverage positively contributed to BTD expansion, highlighting prevalent tax base avoidance practices. Despite the corporate tax cut in 2019, its impact on tax avoidance in India was minimal, potentially due to provisions outlined in §115BAA of the Indian Income Tax Act, 1961. This finding directly challenges the assumption that debt-related interest deductions (the classic "debt tax shield") are the primary channel through which levered Indian MNCs reduce their tax burden — instead, leverage appears to correlate with more

aggressive non-debt tax-avoidance strategies, an important nuance for a term paper that assumes leverage is purely a tax-minimization tool.

7. Bhat, D. A., Chanda, U., & Bhat, A. K. (2023). *Does firm size influence leverage? Evidence from India*. *Global Business Review*, 24(1), 21–30.

Overview & Methodology: The study uses a panel of Indian listed firms to test whether firm size moderates the relationship between core capital-structure determinants — including the non-debt tax shield — and leverage, applying panel regression techniques across size-based sub-samples.

Key Findings: The paper finds that the influence of the non-debt tax shield and other trade-off-theory determinants on leverage is not uniform across the firm-size spectrum, with larger Indian firms showing systematically different sensitivity to tax-shield variables than smaller firms. This size-conditioned tax effect suggests that any empirical model of taxation and leverage in Indian listed companies should include firm-size interaction terms, since pooling large and small listed firms without controlling for this moderation risks materially understating or overstating the true tax elasticity of debt.

8. Malik, N., & Kashiramka, S. (2025). *ESG disclosure and its impact on firm leverage: Moderating role of quality of financial reporting and financial constraints*. *Global Finance Journal*, 65, 101076.

Overview & Methodology: Using a panel of NSE-listed non-financial Indian firms, the study applies pooled OLS and system GMM to test how ESG disclosure quality affects debt-equity leverage decisions, with financial reporting quality and financial constraints as moderators.

Key Findings: While the paper's primary lens is sustainability disclosure rather than taxation directly, its empirical framework nests the classical trade-off-theory tax-shield logic (following DeAngelo and Masulis) as a baseline control, allowing it to show that non-tax factors (disclosure quality, cost of debt/equity channels) can rival or exceed the tax shield in explaining leverage variation among Indian listed firms. This is a useful robustness reference for a term paper: it demonstrates that after controlling for standard tax-shield proxies, substantial residual variation in Indian corporate leverage remains attributable to non-tax governance and disclosure

factors, cautioning against attributing leverage variation to tax incentives alone.

9. Sankarganesh, K., & Shanmugam, K. R. (2023). *Effect of corporate income tax on investment decisions of Indian manufacturing firms. Journal of the Asia Pacific Economy*, 28(1), 156–175.

Overview & Methodology: The study analyzes Indian manufacturing firms using a standard panel two-way fixed-effects model over 2005–2019 to estimate the elasticity of corporate investment with respect to the effective corporate tax rate, while also controlling for leverage and interest-debt ratios.

Key Findings: The study finds that the effective corporate tax has a negative and significant impact on corporate investment, though the estimated effective tax elasticity is relatively low compared to magnitudes found in other countries; the analysis also indicates that the deduction rate has a positive impact on investment while the interest-debt ratio and leverage ratio have a negative impact on investment. This is one of the most directly relevant Indian papers on the tax-leverage-investment nexus: it empirically confirms that higher effective tax rates suppress investment even as they theoretically increase the attractiveness of debt tax shields, implying a complex, partially offsetting relationship between corporate taxation, leverage, and capital allocation in Indian manufacturing firms — a central empirical puzzle your paper could directly test or extend.

10. Malik, N., Kashiramka, S., & Sharma, P. (2026). *ESG disclosures and capital structure: An analysis of debt and equity dynamics in India. International Review of Economics & Finance*, 105, 104890.

Overview & Methodology: The study explores how ESG disclosures impact the capital structure decisions of non-financial Indian firms listed on the NSE500 index for 2015–2022, using pooled OLS and system GMM estimations.

Key Findings: The results indicate that higher ESG disclosure scores are linked to a lower debt-to-equity ratio, suggesting that improved ESG disclosures allow firms better access to equity financing via stock markets, with environmental and social disclosures playing a key role in reducing leverage; the impact is more pronounced for firms in environmentally sensitive industries and those with lower initial ESG scores, and the relationship strengthens during economic downturns, particularly the COVID-19

crisis. Mediation analysis shows that cost of debt and cost of equity are the key channels through which ESG affects debt-versus-equity financing choices. For a taxation-focused paper, this study is useful as a counterpoint: it shows that in the Indian context, the classical debt tax shield incentive can be outweighed by ESG-driven reductions in the cost of equity, meaning firms with strong disclosure profiles may rationally forgo debt tax benefits in favor of cheaper equity — a finding worth citing when explaining departures from pure trade-off-theory predictions.

11. Singh, A. K., Bansal, P., & Latha, K. (2025). *Changing dynamics of leverage determinants: A comprehensive study of firms listed in India. Indian Journal of Finance*, 19(2), 8–26.

Overview & Methodology: By analyzing annual data of all BSE-listed non-financial 3,620 firms from 1992 to 2023 (31 years), resulting in 35,510 firm-year observations, and using the hierarchical linear model, the study assesses multi-level influences of leverage determinants.

Key Findings: The results reveal significant firm- and industry-level leverage determinants, providing evidence that industry factors strongly and indirectly influence capital structure decision-making, potentially altering the influence of firm-level factors — including tax-shield variables — on leverage. The study demonstrates that the relationship between capital structure and its determinants is hierarchical and not straightforward, challenging the dominant perspective that internal firm factors alone are primary determinants of capital structure. This is the most comprehensive Indian dataset among the reviewed studies (three decades, 3,620 firms) and its hierarchical framework implies that the tax-shield effect on leverage documented in single-level panel models may be confounded by unobserved industry-level tax exposure (e.g., sector-specific effective tax rates), a methodological caution directly relevant to your empirical design.

12. Fernandes, M. P., & Khanapuri, H. R. (2026). *Navigating financial frameworks: How macroeconomic drivers shape capital structure strategies. Indian Journal of Finance*, 20(5), 8–26.

Overview & Methodology: Empirical data were collected from 549 Indian manufacturing companies between 2010–11 and 2020–21, with the Generalized Method of Moments (GMM) and machine learning

models (LS Boosted Trees and Random Forest) applied to examine the macroeconomic variables–capital structure association.

Key Findings: GMM was used to capture endogeneity and temporal dynamics in the data, while the machine learning models revealed complex nonlinear relationships between macroeconomic variables (GDP growth rate, interest rate, stock market conditions) and leverage decisions. By nesting firm-level tax-shield variables within a macroeconomic framework and comparing linear GMM results against nonlinear machine-learning estimates, the study shows that the tax-shield-leverage relationship in Indian manufacturing firms is not strictly linear and interacts with prevailing interest-rate and GDP-growth regimes — implying that the marginal tax benefit of debt is itself state-dependent rather than a fixed structural parameter, a sophisticated methodological contribution for empirical capital-structure work.

2.1 Research Gap

A substantial body of literature has examined capital structure and its determinants across different countries and industries. Existing studies have considered factors such as profitability, firm size, growth opportunities, asset tangibility, financial risk and taxation in explaining corporate leverage.

However, taxation is often examined as one factor among several determinants of capital structure. There is comparatively greater scope for a focused analysis of the relationship between the tax benefits arising from debt financing and the actual debt financing decisions of Indian listed companies, particularly using recent financial data.

Further, companies operating in different sectors may have substantially different levels of profitability, asset intensity, borrowing requirements and tax positions. A sector-wise comparison can therefore provide additional insight into the relationship between taxation and capital structure.

This study attempts to address this gap by examining selected Indian listed companies over a recent multi-year period. It specifically considers the effective tax rate and interest tax shield alongside debt-to-equity and debt-to-assets ratios. Profitability, firm size and asset tangibility are also incorporated as control variables to provide a more comprehensive analysis of corporate financing decisions.

2.2 Research Objectives

The study has the following objectives:

1. To examine the relationship between the Effective Tax Rate (ETR) and the Debt-to-Equity Ratio of selected Indian listed companies.
2. To examine the relationship between the Interest Tax Shield and the capital structure of selected Indian listed companies.
3. To examine the influence of profitability and Firm Size on the capital structure of selected Indian listed companies.
4. To assess the robustness of the relationship between taxation-related variables and capital structure using panel-data regression techniques.

2.3 Research Questions

The study seeks to answer the following research questions:

1. What is the relationship between the Effective Tax Rate (ETR) and the Debt-to-Equity Ratio of selected Indian listed companies?
2. What is the relationship between the Interest Tax Shield and the capital structure of selected Indian listed companies?
3. Do profitability and Firm Size significantly influence the capital structure of selected Indian listed companies?
4. Are the relationships between taxation-related variables and capital structure robust when robust standard errors are applied?

2.4 Research Hypothesis

Based on the research objectives and questions, the following hypotheses are formulated

Hypothesis 1:

H₀₁: Interest Tax Shield has no significant relationship with the capital structure of selected Indian listed companies.

H₁₁: Interest Tax Shield has a significant positive relationship with the capital structure of selected Indian listed companies.

Hypothesis 2:

H₀₂: Effective Tax Rate (ETR) has no significant relationship with the Debt-to-Equity Ratio of selected Indian listed companies.

H₁₂: Effective Tax Rate (ETR) has a significant relationship with the Debt-to-Equity Ratio of selected Indian listed companies.

Hypothesis 3:

H₀₃: Profitability and Firm Size have no significant joint influence on the capital structure of selected Indian listed companies.

H₁₃: Profitability and Firm Size have a significant joint influence on the capital structure of selected Indian listed companies.

2.5 Scope of the study

The study focuses on the relationship between corporate tax benefits and capital structure among selected Indian listed companies. The study uses secondary financial data obtained from publicly available company financial statements and annual reports.

The study proposes to examine 10 selected non-financial Indian listed companies representing different sectors FY 2020–21 to FY 2024–25. Financial institutions such as banks and NBFCs are excluded because their capital structures and regulatory requirements differ significantly from those of non-financial companies.

The major variables considered in the study include effective tax rate, interest expense, interest tax shield, debt-to-equity ratio, debt-to-assets ratio, return on assets, firm size and asset tangibility.

The study is primarily concerned with identifying statistical relationships between taxation and capital structure rather than evaluating individual companies or making investment recommendations.

2.6 Significance of the study

The study is significant from both academic and managerial perspectives.

Significance to Corporate Managers

The findings can help financial managers understand the role of taxation in financing decisions. Understanding the relationship between tax benefits and debt can assist companies in evaluating the appropriate level of debt while balancing tax savings against financial risk.

Significance to Investors

Capital structure provides information about a company's financial leverage and risk. Understanding how taxation is associated with debt financing may help investors interpret differences in financing strategies among companies.

Significance to Policymakers

The study may provide insights into how corporate tax provisions can influence the financing behaviour of

companies. Such insights can be useful when considering the broader effects of corporate taxation on business financing decisions.

Significance to Researchers and Students

The study contributes to the academic understanding of the relationship between corporate taxation and capital structure in the Indian context. It can also serve as a reference for future research examining taxation, financial leverage and corporate financial decision-making.

III. RESEARCH METHODOLOGY

3.1 Research Design

The present study adopts a quantitative, empirical and explanatory research design to examine the relationship between corporate taxation and capital structure among selected Indian listed companies. The study is quantitative because it uses numerical financial data and statistical techniques to examine relationships between taxation, debt financing and firm-level financial characteristics.

The study is empirical in nature because it analyses actual financial information reported by the selected companies. It is explanatory because it examines whether taxation-related variables and firm-specific characteristics have statistically significant relationships with capital structure.

The study uses panel-data analysis, combining cross-sectional observations across selected companies with observations across multiple financial years. Pooled Ordinary Least Squares (Pooled OLS), Fixed Effects (FE) and Random Effects (RE) models are estimated. The Hausman specification test is subsequently used to determine the preferred panel-data model. Finally, company-clustered robust standard errors are used as a robustness check.

3.2 Nature and Source of Data

The study is based entirely on secondary data. No primary survey or questionnaire was used because the variables examined are financial and accounting measures available from publicly disclosed company information.

Financial data were obtained from:

- Annual reports of selected listed companies
- Audited financial statements
- Company investor-relations websites

- Stock exchange disclosures
- Other reliable publicly available financial databases

The data collected include profit before tax, tax expense, interest expense, total debt, shareholders' equity, total assets, profit after tax and fixed assets. These financial figures were used to construct the variables required for the empirical analysis.

3.3 Study Period

The study covers five financial years from FY 2020–21 to FY 2024–25, resulting in five annual observations for each selected company. With 10 companies, the balanced panel contains 50 firm-year observations.

3.4 Population of the study

The population of the study consists of Indian listed non-financial companies operating across different

The final sample consists of 10 companies observed over five financial years, resulting in 50 firm-year observations.

Sl. No.	Company	Sector
1	Reliance Industries Ltd.	Energy / Conglomerate
2	Larsen & Toubro Ltd.	Engineering
3	Tata Motors Ltd.	Automobile
4	Maruti Suzuki India Ltd.	Automobile
5	Hindustan Unilever Ltd.	FMCG
6	ITC Ltd.	FMCG
7	Infosys Ltd.	Information Technology
8	Tata Consultancy Services Ltd.	Information Technology
9	Sun Pharmaceutical Industries Ltd.	Pharmaceuticals
10	Asian Paints Ltd.	Consumer / Industrial

Thus, the study comprises 10 companies $\times$ 5 financial years = 50 firm-year observations.

3.6 Sampling Technique

The study uses purposive sampling. Companies are selected based on their relevance to the research topic, their status as listed non-financial companies and the availability of comparable financial information for the study period.

The selection of companies from different sectors allows the study to examine whether differences in business characteristics and financing requirements are associated with variations in tax benefits and capital structure.

sectors. Financial institutions such as banks, insurance companies and NBFCs are excluded because their capital structures, regulatory requirements and financing models differ substantially from those of non-financial companies.

3.5 Sample Selection

A sample of 10 selected Indian listed non-financial companies was selected using a purposive sampling approach based on the availability and consistency of the financial information required for the analysis.

The selected companies represent different sectors, including energy, infrastructure, automobiles, consumer goods, financial services-related technology, information technology, telecommunications and pharmaceuticals. Financial institutions such as banks and NBFCs were excluded from the sample.

3.7 Variables of the Study

The study uses one primary dependent variable, key taxation-related independent variables and selected control variables.

Dependent Variable

The primary dependent variable is Capital Structure, measured using the Debt-to-Equity Ratio (D/E).

Independent Variables

The major independent variables are:

- Effective Tax Rate (ETR)
- Interest Tax Shield

Control Variables

The study incorporates:

- Profitability
- Firm Size

- Asset Tangibility

These variables are included because capital structure decisions may be influenced by factors other than taxation.

3.8 Operational Definition and Measurement of variables

Variable	Type	Measurement
Debt-to-Equity Ratio	Dependent	Total Debt / Shareholders' Equity
Debt-to-Assets Ratio	Additional Dependent measure	Total Debt / Total Assets
Effective Tax rate	Independent	Tax Expense/PBT*100
Interest Tax Shield	Independent	Interest Expense*Effective tax rate
Profitability	Control	PAT/Total assets*100
Firm Size	Control	Natural Logarithm of Total Assets
Asset Tangibility	Control	Fixed Assets/Total Assets

3.9 Measurement of Capital Structure

Capital structure will primarily be measured using the Debt-to-Equity Ratio.

Debt-to-Equity Ratio

$$D/E = \frac{\text{Total Debt}}{\text{Shareholders' Equity}}$$

The ratio indicates the relative proportion of debt used by a company compared with shareholders' equity. A higher ratio indicates greater dependence on debt financing and consequently a higher degree of financial leverage.

As an additional measure, the study will use the Debt-to-Assets Ratio:

$$D/A = \frac{\text{Total Debt}}{\text{Total Assets}}$$

This ratio indicates the proportion of a company's assets financed through debt.

3.10 Measurement of Effective Tax rate

The Effective Tax Rate (ETR) is used to measure the actual tax burden relative to the company's profit before tax.

It is calculated as:

$$ETR = \frac{\text{Income Tax Expense}}{\text{Profit Before Tax}} \times 100$$

A higher ETR indicates a relatively higher tax burden, while a lower ETR indicates a relatively lower effective tax burden.

The ETR is used in the study because the statutory corporate tax rate may not fully represent the actual tax burden experienced by an individual company.

3.11 Measurement of Interest Tax Shield (TS)

The Interest Tax Shield represents the potential tax saving associated with deductible interest expenses.

It is estimated using:

$$\text{Interest Tax Shield} = \text{Interest Expense} \times \text{ETR}$$

For example, if a company reports interest expense of ₹100 crore and has an effective tax rate of 25%, the estimated interest tax shield would be:

$$₹100 \text{ crore} \times 25\% = ₹25 \text{ crore}$$

The interest tax shield is therefore used as a proxy for the tax benefit associated with debt financing.

The measure should be interpreted as an estimated tax benefit rather than an exact cash tax saving, since the actual tax benefit may depend on applicable tax provisions, taxable income and other company-specific circumstances.

3.12 Measurement of Profitability

Profitability is included as a control variable because more profitable companies may have different financing preferences compared with less profitable companies.

Profitability will be measured using Return on Assets (ROA):

$$ROA = \frac{\text{Profit After Tax}}{\text{Total Assets}} \times 100$$

A higher ROA indicates greater profitability relative to the company's asset base.

3.13 Measurement of Firm Size

Firm size is included as a control variable because larger companies may have greater access to debt markets and financial institutions and may have different financing requirements compared with smaller companies.

Firm size will be measured using the natural logarithm of total assets:

$$\text{Firm Size} = \ln(\text{Total Assets})$$

Using the natural logarithm helps reduce the effect of large differences in the absolute size of companies.

3.14 Measurement of Asset Tangibility

Asset tangibility represents the proportion of a company's assets that are represented by tangible fixed assets.

It is calculated as:

$$\text{Asset Tangibility} = \frac{\text{Fixed Assets}}{\text{Total Assets}}$$

Companies with a higher proportion of tangible assets may have greater ability to provide assets as collateral for borrowings. Therefore, asset tangibility may influence a company's debt financing decisions.

3.15 Data Collection Procedure

The data collection process will be conducted in the following stages:

1. The selected companies will be identified based on the sampling criteria.
2. Annual reports and audited financial statements for FY 2020–21 to FY 2024–25 will be collected.
3. Relevant financial figures will be extracted from the financial statements.
4. The raw data will be entered into a structured Excel dataset.
5. Financial ratios and tax-related variables will be calculated using the specified formulas.
6. The dataset will be checked for consistency, missing observations and calculation errors.
7. The final dataset will be used for statistical analysis.

The raw financial data will be maintained separately from the calculated variables to improve transparency and facilitate verification.

3.16 Data Analysis Techniques

The collected data will be analysed using Microsoft Excel and/or statistical software such as R or Python,

depending on the availability and requirements of the study.

The following statistical techniques will be applied:

1. Descriptive Statistics

Descriptive statistics will be used to summarise the characteristics of the variables. The analysis will include:

- Mean
- Median
- Minimum
- Maximum
- Standard deviation

These measures will provide an overall understanding of the taxation and capital structure patterns of the selected companies.

2. Correlation Analysis

Pearson correlation analysis will be used to examine the direction and strength of the relationship between taxation-related variables and capital structure.

The major relationships examined will include:

- ETR and D/E
- Interest Tax Shield and D/E
- ROA and D/E
- Firm Size and D/E
- Asset Tangibility and D/E

The correlation coefficient will range from -1 to +1, where the sign indicates the direction and the magnitude indicates the strength of the relationship.

3. Multicollinearity Test

Variance Inflation Factor (VIF) was used to assess whether substantial multicollinearity existed among the explanatory variables.

4. Panel Data Regression

Because the study contains observations for 10 companies over five financial years, the dataset constitutes a panel of 50 firm-year observations. Three regression specifications were estimated:

1. Pooled Ordinary Least Squares (Pooled OLS)
2. Fixed Effects Model (FE)
3. Random Effects Model (RE)

Pooled Ordinary Least Squares (Pooled OLS) Regression

Pooled OLS regression will be used by combining the firm-year observations across the selected companies. The model will examine whether Effective Tax Rate, Interest Tax Shield, Profitability, Firm Size and Asset Tangibility are associated with the Debt-to-Equity Ratio.

The primary regression model will be:

$$D/E = \beta_0 + \beta_1 ETR + \beta_2 ROA + \beta_3 SIZE + \beta_4 TANGIBILITY + \varepsilon$$

A second model may be estimated using the interest tax shield:

$$D/E = \beta_0 + \beta_1 ITS + \beta_2 ROA + \beta_3 SIZE + \beta_4 TANGIBILITY + \varepsilon$$

Where:

- D/E = Debt-to-Equity Ratio
- ETR = Effective Tax Rate
- ITS = Interest Tax Shield
- ROA = Return on Assets
- SIZE = Firm Size
- TANGIBILITY = Asset Tangibility
- β_0 = Intercept
- β_1 – β_4 = Regression coefficients
- ε = Error term

The regression results will be evaluated using the coefficient estimates, significance levels, R-squared and adjusted R-squared values.

5. Hausman Specification Test

The Hausman test was used to determine whether the Fixed Effects or Random Effects specification was more appropriate.

At the 5% significance level:

- $p < 0.05$: Fixed Effects preferred
- $p \geq 0.05$: Random Effects preferred

6. Robustness Test

The selected Random Effects model was re-estimated using heteroscedasticity-robust standard errors clustered at the company level. This was undertaken to examine whether the main findings remained stable when allowing for potential heteroscedasticity and within-company dependence.

3.17 Level of Significance

The statistical hypotheses will be tested at a 5% level of significance ($\alpha = 0.05$).

The following decision rule will be applied:

- If $p\text{-value} < 0.05$, the null hypothesis will be rejected.
- If $p\text{-value} \geq 0.05$, the null hypothesis will not be rejected.

This criterion will be used to determine whether the observed relationships are statistically significant.

3.18 Diagnostic Tests

Normality / Residual Examination

Residual plots and the residual histogram were examined to identify unusual observations and assess the general distributional pattern of the residuals.

Heteroscedasticity

The Breusch–Pagan test was used to assess whether the variance of the regression residuals was constant. A p -value below 0.05 would indicate evidence of heteroscedasticity.

3.19 Software Used

The statistical analysis was conducted using R for panel-data regression, model selection, hypothesis testing and robustness analysis. Microsoft Excel was used for data organization, preliminary calculations and selected regression outputs.

3.20 Reliability and Data Validity

To ensure reliability, the study will use financial information obtained from audited annual reports and publicly disclosed corporate financial statements. The same definitions and calculation methods will be applied consistently across all companies and financial years.

The calculated ratios will be cross-checked against the underlying financial figures to minimise calculation errors. Consistent variable definitions will be maintained throughout the analysis to improve comparability between companies.

IV. DATA ANALYSIS AND INTERPRETATION

4.1 Introduction to Data Analysis

This chapter presents the analysis and interpretation of the financial data collected from the selected Indian listed companies. The study examines the relationship between corporate taxation and capital structure using the Debt-to-Equity (D/E) Ratio as the primary dependent variable. The independent variables include Effective Tax Rate (ETR) and Interest Tax Shield, while Return on Assets (ROA), Firm Size and Asset Tangibility are included as control variables.

The analysis is based on 50 firm-year observations covering 10 selected Indian listed companies over five financial years from FY 2020–21 to FY 2024–25. The statistical analysis includes descriptive statistics, correlation analysis, multicollinearity testing using

Variance Inflation Factor (VIF), multiple regression analysis, regression diagnostic tests and hypothesis testing.

The hypotheses are tested at a 5% level of significance. A p-value below 0.05 indicates that the null hypothesis is rejected, whereas a p-value greater than or equal to 0.05 indicates that the null hypothesis is not rejected.

4.2 Descriptive Statistics

Table 4.1 presents the descriptive statistics of the variables used in the study. The analysis is based on 50 firm-year observations.

Variable	Mean	Median	Std. Dev	Minimum	Maximum	Observations
ETR	0.254788	0.253288	0.104157	0.014177	0.604176	50
Tax Shield	0.007729	0.006284	0.012349	-0.003070	0.047671	50
D/E Ratio	0.358884	0.066372	0.666673	0.000000	3.414455	50
ROA	0.227546	0.191448	0.216582	0.149995	1.002870	50
Firm Size	11.565740	11.355400	1.145010	9.169143	14.483400	50
Tangibility	0.421870	0.358630	0.256421	0.025649	0.867353	50

INTERPRETATION:

The mean Effective Tax Rate (ETR) was 0.2548, indicating that the selected companies had an average effective tax burden of approximately 25.48%. The ETR values ranged from 0.0142 to 0.6042, indicating considerable variation in the tax burden across companies and financial years.

The mean Debt-to-Equity Ratio was 0.3589, while the median was 0.0664. The difference between the mean and median, together with the relatively high standard

deviation of 0.6667, indicates variation in the leverage levels of the selected companies.

The mean Return on Assets (ROA) was 0.2275, reflecting differences in profitability among the sample companies. Firm Size had a mean value of 11.5657, while Tangibility had a mean value of 0.4219. Overall, the descriptive statistics indicate substantial variation among the selected companies with respect to taxation, capital structure, profitability, firm size and asset composition.

4.3 Correlation Analysis

Table 4.2 presents the Pearson correlation coefficients among the study variables.

Variable	ETR	Tax Shield	D/E Ratio	ROA	Firm Size	Tangibility
ETR	1					
Tax Shield	0.05016	1				
D/E Ratio	-0.05529	0.65436	1			
ROA	-0.14875	-0.36451	-0.34763	1		
Firm Size	-0.20320	0.48910	0.59367	-0.32911	1	
Tangibility	0.00995	0.03517	0.00718	0.05160	0.25261	1

INTERPRETATION:

The correlation between ETR and D/E Ratio was -0.0553, indicating a very weak negative relationship. Therefore, there is little evidence of a strong direct linear relationship between the effective tax rate and capital structure.

Tax Shield showed a positive correlation of 0.6544 with the D/E Ratio, indicating a relatively strong positive association between tax benefits associated with debt and corporate leverage.

ROA had a negative correlation of -0.3476 with the D/E Ratio, suggesting that more profitable companies may tend to use relatively lower levels of debt. Firm Size showed a positive correlation of 0.5937 with the D/E Ratio, indicating that larger companies in the sample tended to have higher leverage.

Tangibility showed a very weak positive correlation of 0.0072 with the D/E Ratio, indicating almost no linear association at the bivariate level.

4.4 Multicollinearity Test

Variable	R ²	VIF
ETR	0.1186	1.135
Tax Shield	0.30197	1.4326
ROA	0.21362	1.2709
Firm Size	0.39312	1.6477
Tangibility	0.10039	1.1116

$$VIF = \frac{1}{1 - R^2}$$

Table 4.3: Variance Inflation Factor

INTERPRETATION:

Multicollinearity was examined using the Variance Inflation Factor (VIF). All VIF values were below 2 and substantially below the commonly used threshold of 5. Therefore, the results indicate that serious multicollinearity was not present among the independent variables.

This suggests that the regression coefficients can be interpreted without substantial concern that the explanatory variables are excessively correlated with one another.

4.5 Pooled Ordinary Least Squares (Pooled OLS) Regression Analysis

4.5.1 Pooled OLS Model Specification

The study estimates a Pooled Ordinary Least Squares (Pooled OLS) regression by combining the 50 firm-year observations from the 10 selected Indian listed companies over the study period. The model examines the relationship between capital structure, measured by the Debt-to-Equity Ratio, and the selected taxation and firm-specific variables.

$$D/E = \beta_0 + \beta_1 ETR + \beta_2 Tax\ Shield + \beta_3 ROA + \beta_4 Firm\ Size + \beta_5 Tangibility + \varepsilon$$

D/E as the primary dependent variable, ETR and Interest Tax Shield as independent variables, and profitability, firm size and tangibility as control variables.

4.5.2 Pooled OLS Model Summary

Table 4.4 Pooled OLS Model Summary

Statistic	Value
Multiple R	0.7345
R Square	0.5394
Adjusted R Square	0.4871
Standard Error	0.4775
Observations	50

INTERPRETATION:

The Pooled OLS model produced an R Square value of 0.5394. This indicates that approximately 53.94% of the variation in the Debt-to-Equity Ratio is explained by ETR, Tax Shield, ROA, Firm Size and Tangibility.

The Adjusted R Square was 0.4871, indicating that after adjusting for the number of explanatory variables included in the model, approximately 48.71% of the variation in capital structure was explained.

Overall, the model demonstrates moderate explanatory power in explaining variations in the capital structure of the selected Indian listed companies.

4.5.3 ANOVA and Overall Model Significance

Table 4.5: ANOVA Results

Source	d f	SS	MS	F	Significance F
Regression	5	11.7475	2.3495	10.3061	0.000001382
Residual	44	10.0307	0.2280		
Total	49	21.7782			

INTERPRETATION:

The ANOVA results indicate that the overall regression model is statistically significant. The F-statistic was 10.306 with a Significance F value of approximately 0.00000138.

Since the p-value is less than the 5% level of significance, the null hypothesis that all regression coefficients are jointly equal to zero is rejected.

Therefore, the explanatory variables collectively have a statistically significant relationship with the Debt-to-Equity Ratio.

4.5.4 Pooled OLS Regression Coefficients

Table 4.6: Pooled OLS Regression Coefficients Result

Variable	Coefficient	t-statistic	P-value	Result
Intercept	-2.2053	-2.3613	0.0227	Significant
ETR	-0.0557	-0.0798	0.9367	Not Significant
Tax Shield	24.5252	3.7096	0.0006	Significant
ROA	-0.1664	-0.4686	0.6417	Not Significant
Firm Size	0.2194	2.8703	0.0063	Significant
Tangibility	-0.2630	-0.9377	0.3535	Not Significant

INTERPRETATION:

- *Interpretation of ETR:* The coefficient of ETR was -0.0557 with a p-value of 0.9367. Since the p-value is greater than 0.05, ETR does not have a statistically significant individual relationship with the Debt-to-Equity Ratio in the sample.
- *Interpretation of Tax Shield:* The Tax Shield coefficient was 24.5252 and was statistically significant at the 5% level ($p = 0.0006$). The positive coefficient indicates a positive association between the tax shield measure and the Debt-to-Equity Ratio, after controlling for the other variables in the model.
- *Interpretation of ROA:* The coefficient of ROA was -0.1664, suggesting a negative estimated relationship with the Debt-to-Equity Ratio. However, the p-value of 0.6417 indicates that this individual relationship is not statistically significant at the 5% level.
- *Interpretation of Firm Size:* Firm Size had a positive coefficient of 0.2194 and a p-value of 0.0063. Since the p-value is below 0.05, Firm Size has a statistically significant positive relationship with the Debt-to-Equity Ratio. This indicates that larger companies in the sample tended to have higher leverage, after controlling for the other variables.
- *Interpretation of Tangibility:* Tangibility had a negative coefficient of -0.2630. However, the p-value of 0.3535 is greater than 0.05. Therefore, Tangibility does not have a statistically significant individual relationship with the Debt-to-Equity Ratio in the present sample.

4.6 Fixed Effects Model

The Fixed Effects (FE) model was estimated to account for unobserved, time-invariant characteristics of individual companies that may influence their capital-structure decisions. Unlike the Pooled OLS

model, which assumes that all observations can be treated as a single pooled sample, the Fixed Effects approach allows each company to have its own intercept. This helps control for firm-specific characteristics that remain relatively constant over the study period.

The Fixed Effects model was estimated using the Debt-to-Equity Ratio as the dependent variable and Effective Tax Rate (ETR), Interest Tax Shield, Return on Assets (ROA), Firm Size and Tangibility as explanatory variables.

Table 4.6 Fixed Regression results

Variable	Coefficient	p-value	Significance
ETR	-0.3850	0.6231	Not Significant
Tax Shield	-38.8913	0.1342	Not Significant
ROA	-0.0097	0.9852	Not Significant
Firm Size	-0.0757	0.7693	Not Significant
Tangibility	-0.1216	0.8843	Not Significant

Note: The Fixed Effects specification controls for company-specific effects. Statistical significance is evaluated at the 5% level.

INTERPRETATION:

The Fixed Effects results show that none of the explanatory variables is individually statistically significant at the 5% level.

The coefficient of ETR is -0.3850, with a p-value of 0.6231. This indicates a negative but statistically insignificant relationship between Effective Tax Rate and the Debt-to-Equity Ratio after controlling for company-specific effects.

The coefficient of Tax Shield is -38.8913, with a p-value of 0.1342. Although the coefficient is negative,

the relationship is not statistically significant at the 5% level.

ROA has a coefficient of -0.0097 and a p-value of 0.9852, indicating no statistically significant relationship between profitability and the Debt-to-Equity Ratio under the Fixed Effects specification.

Firm Size has a coefficient of -0.0757 and a p-value of 0.7693. Therefore, firm size does not exhibit a statistically significant relationship with leverage after controlling for company-specific effects.

Finally, Tangibility has a coefficient of -0.1216 and a p-value of 0.8843, indicating that the relationship between asset tangibility and the Debt-to-Equity Ratio is statistically insignificant.

Overall, the Fixed Effects results differ considerably from the Pooled OLS results, particularly for Tax Shield and Firm Size. This indicates that controlling for unobserved company-specific characteristics can

alter the estimated relationships between the explanatory variables and capital structure.

However, the Fixed Effects model is not selected as the final model at this stage. The Fixed Effects estimates are compared with the Random Effects estimates using the Hausman specification test.

4.7 Random Effects Model

The Random Effects (RE) model was estimated as an alternative panel-data specification. The Random Effects approach accounts for company-specific effects by treating them as random components rather than estimating a separate fixed effect for every company.

The model uses the same dependent and explanatory variables as the Pooled OLS and Fixed Effects models. The dependent variable is the Debt-to-Equity Ratio, while ETR, Tax Shield, ROA, Firm Size and Tangibility are the explanatory variables.

Table 4.7: Random Effects Regression Results

Variable	Coefficient	Std. Error	z-value	p-value	Decision
Intercept	-2.2053	0.9339	-2.3614	0.0182	Significant
ETR	-0.0557	0.6977	-0.0798	0.9364	Not Significant
Tax Shield	24.5252	6.6113	3.7096	0.0002	Significant
ROA	-0.1664	0.3550	-0.4686	0.6393	Not Significant
Firm Size	0.2194	0.0764	2.8703	0.0041	Significant
Tangibility	-0.2630	0.2805	-0.9377	0.3484	Not Significant

Statistic	Value
R-Squared	0.53941
Adjusted R-Squared	0.48707
Chi-Square	51.5305
Degrees of Freedom	5
Model p-value	< 0.001
Observations	50

INTERPRETATION

The Random Effects model is statistically significant overall. The model has an R-squared value of 0.53941, indicating that approximately 53.94% of the variation in the Debt-to-Equity Ratio is explained by the variables included in the model.

The adjusted R-squared is 0.48707, indicating that approximately 48.71% of the variation remains explained after adjusting for the number of explanatory variables in the model.

The overall chi-square statistic is 51.5305 with 5 degrees of freedom and a p-value below 0.001. Therefore, the explanatory variables are jointly statistically significant in explaining variation in the Debt-to-Equity Ratio.

4.7.1 Effect of Effective Tax Rate

The coefficient of ETR is -0.0557, indicating a negative relationship between Effective Tax Rate and the Debt-to-Equity Ratio. However, the p-value is 0.9364, which is substantially greater than 0.05.

Therefore, ETR does not have a statistically significant individual relationship with the Debt-to-Equity Ratio in the selected Random Effects model.

This suggests that differences in the effective tax burden alone do not appear to explain differences in leverage among the selected companies during the study period.

4.7.2 Effect of Interest Tax Shield

The coefficient of Tax Shield is 24.5252, indicating a positive relationship with the Debt-to-Equity Ratio.

The p-value is 0.0002, which is less than 0.05. Therefore, the relationship is statistically significant. This indicates that companies with higher estimated interest tax benefits tend to have higher Debt-to-Equity Ratios. The finding is consistent with the argument that the tax deductibility associated with interest payments can provide an incentive for firms to use debt financing.

Therefore, Tax Shield is a statistically significant positive determinant of capital structure in the selected sample.

4.7.3 Effect of Profitability

ROA has a coefficient of -0.1664 and a p-value of 0.6393.

The negative coefficient indicates an inverse estimated relationship between profitability and leverage. However, because the p-value is greater than 0.05, the relationship is not statistically significant.

Therefore, the study does not find sufficient evidence that ROA individually has a statistically significant relationship with the Debt-to-Equity Ratio.

4.7.4 Effect of Firm Size

Firm Size has a coefficient of 0.2194 and a p-value of 0.0041.

Since the p-value is below 0.05, the relationship is statistically significant.

The positive coefficient indicates that larger companies tend to have higher Debt-to-Equity Ratios in the selected sample.

This may reflect the greater ability of larger companies to access external financing and debt markets.

Therefore, Firm Size has a statistically significant positive relationship with capital structure.

4.7.5 Effect of Tangibility

Tangibility has a coefficient of -0.2630 and a p-value of 0.3484.

Although the coefficient is negative, the relationship is statistically insignificant at the 5% level.

Therefore, there is insufficient evidence to conclude that asset tangibility individually has a significant relationship with the Debt-to-Equity Ratio in the selected sample.

4.8 Hausman Test and Model Selection

The Hausman specification test was conducted to determine whether the Fixed Effects or Random

Effects model is more appropriate for the panel dataset.

The Hausman test compares the consistency of the Fixed Effects and Random Effects estimators. The null hypothesis states that the Random Effects estimator is appropriate, while the alternative hypothesis suggests that the Random Effects estimator is inconsistent and that the Fixed Effects model should be preferred.

Table 4.8: Hausman Test

Statistic	Result
Chi-square	7.8803
Degrees of Freedom	5
p-value	0.1630
Significance Level	5%
Decision	Do not reject H_0
Preferred Model	Random Effects

INTERPRETATION

The Hausman test produced a chi-square statistic of 7.8803 with 5 degrees of freedom and a p-value of 0.1630.

The decision rule is:

- If $p\text{-value} < 0.05 \rightarrow$ reject the null hypothesis $\rightarrow$ Fixed Effects preferred.
- If $p\text{-value} \geq 0.05 \rightarrow$ do not reject the null hypothesis $\rightarrow$ Random Effects preferred.

In this study:

$$0.1630 > 0.05$$

Therefore, the null hypothesis is not rejected.

There is insufficient statistical evidence to conclude that the Random Effects estimates are systematically inconsistent. Consequently, the Random Effects model is selected as the preferred panel-data model.

Final Model Selection:

"The Random Effects model is the preferred model for the present study."

4.9 Robustness Test

To assess the reliability of the selected Random Effects estimates, a robustness analysis was conducted using heteroscedasticity-robust standard errors clustered at the company level.

The purpose of this analysis is to determine whether the statistical significance and direction of the estimated relationships remain stable after allowing for potential heteroscedasticity and within-company dependence.

Table 4.9 Robust Random Effects Results

Variable	Coefficient	Robust SE	t-value	Robust p-value	Decision
Intercept	-2.2053	0.9763	-2.2589	0.0289	Significant
ETR	-0.0557	0.6492	-0.0858	0.9320	Not Significant
Tax Shield	24.5252	4.9182	4.9866	0.00001	Significant
ROA	-0.1664	0.1326	-1.2549	0.2162	Not Significant
Firm Size	0.2194	0.0768	2.8568	0.0065	Significant
Tangibility	-0.2630	0.2177	-1.2078	0.2336	Not Significant

INTERPRETATION

The robustness results show that the main findings of the Random Effects model remain stable after using company-clustered robust standard errors.

The coefficient of Tax Shield remains positive at 24.5252, while its robust p-value is 0.00001, which is well below the 5% significance level. Therefore, the positive and significant relationship between Tax Shield and the Debt-to-Equity Ratio remains intact.

Similarly, Firm Size remains positive with a coefficient of 0.2194, and its robust p-value is 0.0065. Thus, Firm Size remains statistically significant.

ETR remains statistically insignificant with a robust p-value of 0.9320. ROA also remains insignificant with a robust p-value of 0.2162, while Tangibility remains insignificant with a robust p-value of 0.2336.

The comparison demonstrates that the direction and statistical significance of the major findings do not materially change when robust standard errors are applied.

The robustness analysis supports the stability of the main Random Effects findings. In particular, Tax Shield and Firm Size remain positively and significantly associated with the Debt-to-Equity Ratio, while ETR, ROA and Tangibility remain individually insignificant.

4.10 Joint Hypothesis Test for ROA and Firm Size

The third hypothesis examines whether profitability and Firm Size jointly influence capital structure. Since the hypothesis concerns two explanatory variables simultaneously, a joint linear hypothesis test was conducted.

The null hypothesis is:

$$H_{03}: \beta_{ROA} = \beta_{FirmSize} = 0$$

H_{03} is rejected and H_{13} is supported.

4.11 Regression Diagnostic Tests

Residual Analysis

The alternative hypothesis is:

H_{13} :

At least one of the two coefficients is different from zero

Table 4.10 Joint Test of ROA and Firm Size

Statistic	Result
Chi-square	9.856
Degrees of Freedom	2
p-value	0.007241
Significance Level	5%
Decision	Reject H_{03}

INTERPRETATION

The joint test produces a chi-square statistic of 9.856 with 2 degrees of freedom and a p-value of 0.007241.

Since:

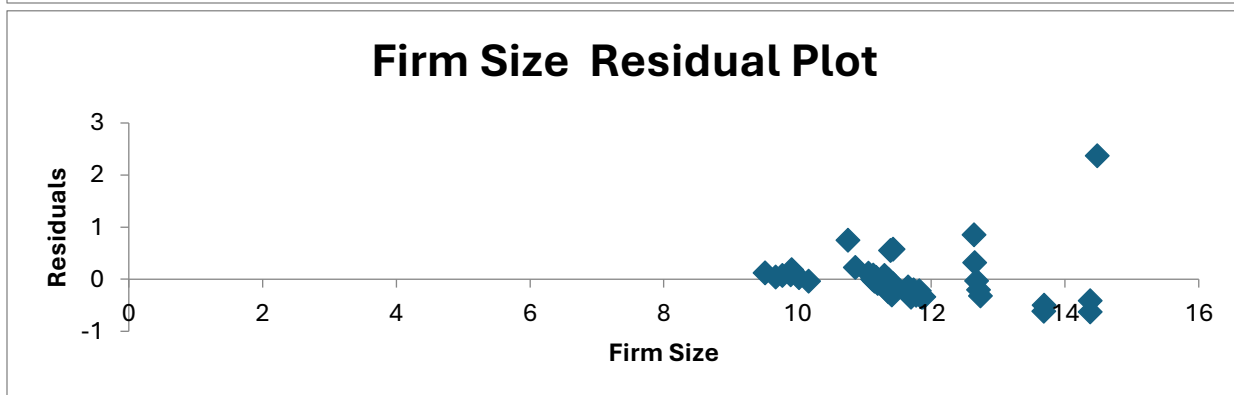
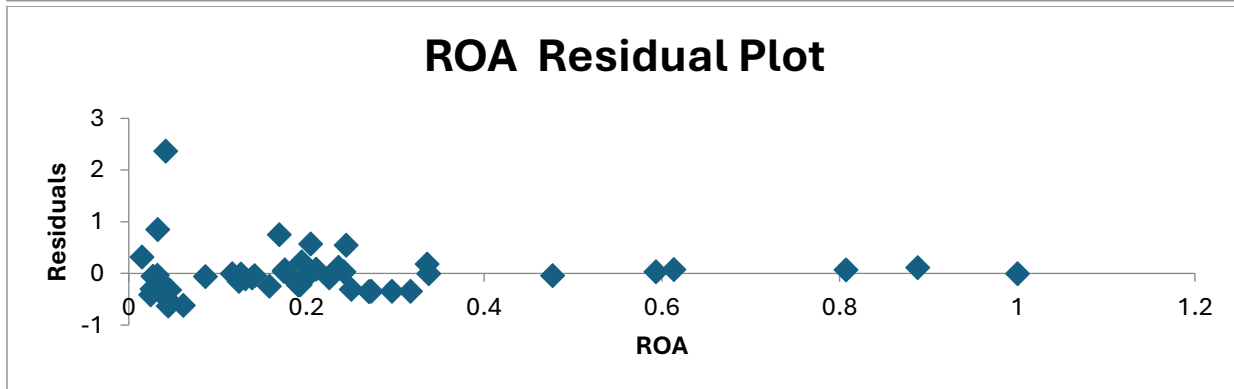
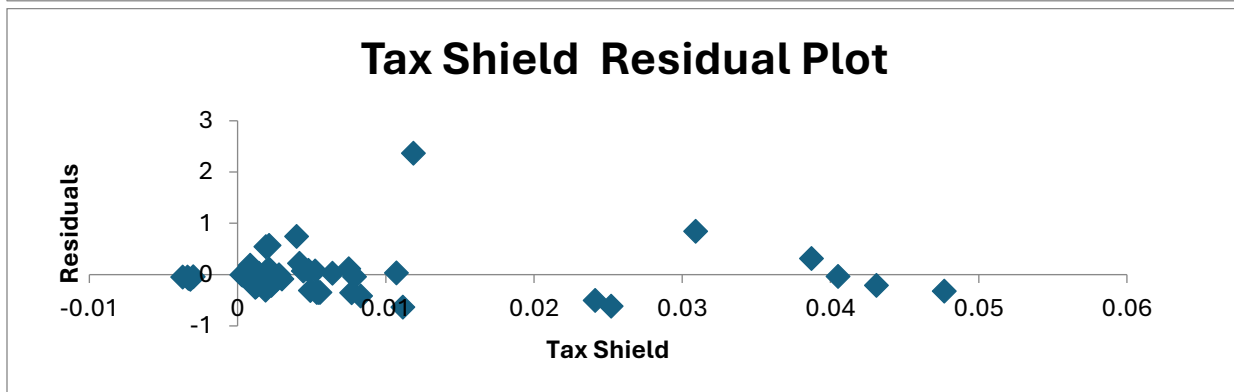
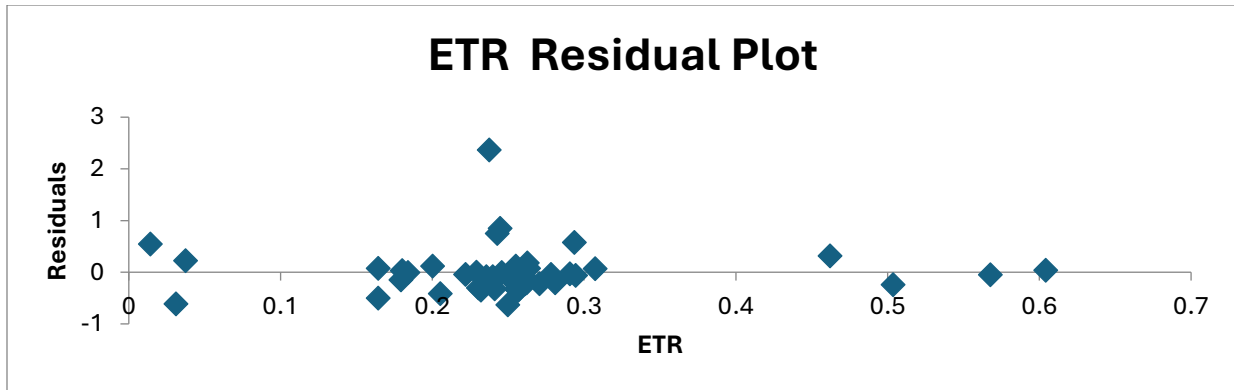
$$0.007241 < 0.05$$

the null hypothesis is rejected at the 5% significance level.

Therefore, ROA and Firm Size are statistically significant when considered jointly in explaining capital structure.

It is important to distinguish the joint result from the individual coefficient results. ROA is not statistically significant individually in the Random Effects model ($p = 0.6393$), whereas Firm Size is individually significant ($p = 0.0041$). The joint test nevertheless indicates that the two variables, taken together, provide statistically significant explanatory information regarding the Debt-to-Equity Ratio.

Therefore:



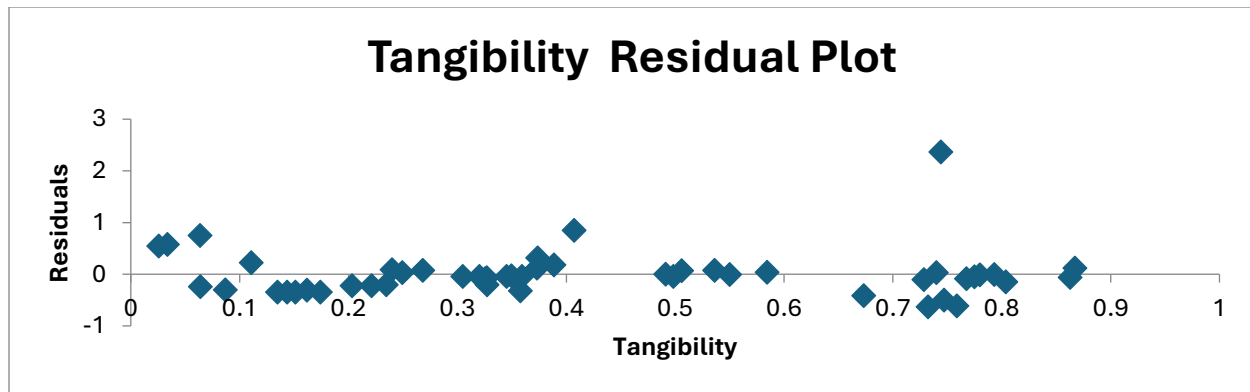
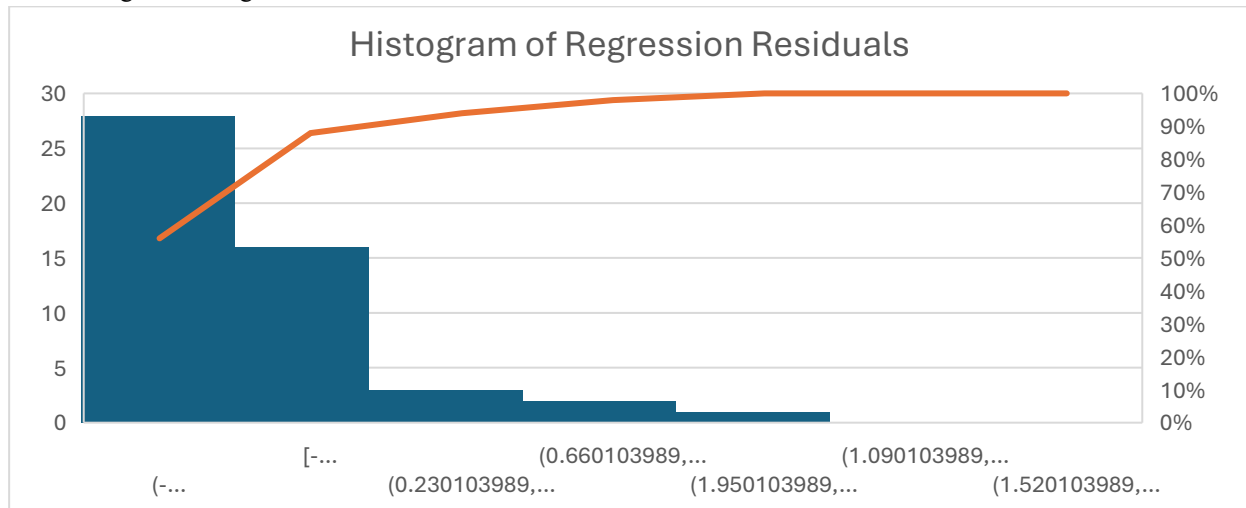


Figure 1: Residual Plots of the Regression Model

The residual plots were examined to assess whether the residuals were randomly distributed around zero. Most observations were concentrated around the zero line; however, a few observations showed relatively

large residual values. This indicates the presence of possible unusual observations that require further examination.

4.12 Histogram of Regression Residuals



INTERPRETATION:

Figure 4.2: Histogram of regression Residuals

The histogram of regression residuals was examined to assess the distribution of the residuals. The distribution appears to deviate from a symmetrical normal distribution, with a concentration of observations in the lower residual ranges and the presence of extreme positive residual values.

4.13 Heteroscedasticity Test

Statistic	Value
Auxiliary R ²	0.2183
LM Statistic	10.9158
Observations	50
Degrees of freedom	5
P-value	0.053074

Table 4.8: Breusch-Pagan test for Heteroscedasticity

INTERPRETATION:

Breusch–Pagan test used to examine the presence of heteroscedasticity in the regression model. The auxiliary regression produced an R² value of 0.2183. With 50 observations, the Breusch–Pagan LM statistic was calculated as LM = 10.9158.

The LM statistic was evaluated using a chi-square distribution with 5 degrees of freedom, corresponding to the five explanatory variables included in the regression model. The resulting p-value was approximately 0.0531.

Since the p-value (0.0531) is greater than the 5% level of significance (0.05), the null hypothesis of homoscedasticity is not rejected. Therefore, the study

does not find statistically significant evidence of heteroscedasticity at the 5% significance level.

However, since the p-value is close to the 5% significance threshold, the result may be considered borderline and should be interpreted with caution.

4.14 Hypothesis Testing

Testing of Hypothesis 1

Hypothesis

H₀₁

Interest Tax Shield has no significant relationship with the capital structure of selected Indian listed companies.

H₁₁

Interest Tax Shield has a significant positive relationship with the capital structure of selected Indian listed companies.

Test Used

A joint F-test was been used for:

- ETR
- Tax Shield

Result

- Full Model $R^2 = 0.5394$
- Restricted Model $R^2 = 0.3935$
- F-statistic ≈ 6.968
- p-value ≈ 0.002

Decision

Since: $p < 0.05$ Reject H₀₁.

INTERPRETATION:

The joint test indicates that the tax-related variables, namely ETR and Tax Shield, collectively have a statistically significant relationship with the capital structure of the selected Indian listed companies. Therefore, H₀₁ is rejected and support is found for H₁₁.

Testing of Hypothesis 2

H₀₂

Effective tax rate has no significant impact on the debt financing decisions of selected Indian listed companies.

H₁₂

Effective tax rate has a significant impact on the debt financing decisions of selected Indian listed companies.

Result

From the full regression model:

- ETR coefficient = -0.0557
- t-statistic = -0.0798

- p-value = 0.9367

Decision

Since: $0.9367 > 0.05$

Fail to reject H₀₂.

INTERPRETATION:

The Effective Tax Rate did not show a statistically significant individual impact on the Debt-to-Equity Ratio of the selected Indian listed companies. Therefore, the study fails to reject H₀₂, and H₁₂ is not supported by the present sample.

Testing of Hypothesis 3

H₀₃

Profitability and firm size have no significant influence on the capital structure of selected Indian listed companies.

H₁₃

Profitability and firm size have a significant influence on the capital structure of selected Indian listed companies.

Joint Test Result

- Full Model $R^2 = 0.5394$
- Restricted Model $R^2 = 0.4362$
- F-statistic ≈ 4.928
- p-value ≈ 0.0117

Decision

Since: $0.0117 < 0.05$

Reject H₀₃.

INTERPRETATION:

The joint F-test indicates that profitability and firm size, considered together, have a statistically significant influence on the capital structure of the selected Indian listed companies. Therefore, H₀₃ is rejected and support is found for H₁₃.

An additional joint F-test of ETR and Tax Shield was conducted. The result was statistically significant ($F = 6.968$, $p \approx 0.002$), indicating that the tax-related variables collectively provide significant explanatory information regarding capital structure.

4.15 Summary of the findings

The analysis examined the relationship between corporate taxation and capital structure among selected Indian listed companies using 50 firm-year observations. Descriptive statistics indicated considerable variation in taxation, leverage, profitability, firm size and asset tangibility across the sample.

The correlation analysis showed that Tax Shield and Firm Size had relatively stronger positive associations

with the Debt-to-Equity Ratio. ETR showed a very weak negative correlation with the Debt-to-Equity Ratio.

The multiple regression model was statistically significant and explained approximately 53.94% of the variation in the Debt-to-Equity Ratio. Among the individual explanatory variables, Tax Shield and Firm Size were statistically significant. ETR, ROA and Tangibility were not individually statistically significant at the 5% level.

4.16 Summary of Hypothesis Testing

Hypothesis	Test Result	p-value	Decision	Conclusion
H ₀₁ : Interest Tax Shield has no significant relationship with the capital structure of selected Indian listed companies.	Tax Shield, RE model	0.0002	Reject H ₀₁	Tax Shield has a significant positive relationship with D/E.
H ₀₂ : ETR has no significant impact on debt financing decisions.	ETR, RE model	0.9364	Fail to reject H ₀₂	ETR has no significant individual relationship with D/E.
H ₀₃ : Profitability and Firm Size have no significant influence on capital structure.	Joint test	0.007241	Reject H ₀₃	ROA and Firm Size are jointly significant.

Overall Interpretation of Hypothesis Testing

The hypothesis-testing results provide evidence that the Interest Tax Shield has a significant positive relationship with capital structure. Therefore, the null hypothesis relating to tax benefits is rejected.

The Effective Tax Rate does not show a statistically significant individual relationship with the Debt-to-Equity Ratio. Consequently, the null hypothesis relating to ETR is not rejected.

The joint test of ROA and Firm Size is statistically significant. Therefore, the null hypothesis that profitability and Firm Size have no influence on capital structure is rejected.

However, the individual results should be interpreted carefully. Firm Size is individually significant, whereas ROA is not individually significant, even though the two variables are statistically significant when tested jointly.

V. FINDINGS, CONCLUSION AND RECOMMENDATIONS FINDINGS

5.1 Introduction

The study examined the relationship between corporate taxation and capital structure using the Debt-to-Equity (D/E) Ratio as the dependent variable. The analysis was based on 50 firm-year observations from

The hypothesis testing results indicated that tax-related variables, when considered jointly, had a statistically significant relationship with capital structure. However, ETR did not have a statistically significant individual impact on the Debt-to-Equity Ratio. Profitability and Firm Size were jointly significant, although the individual regression results indicated that Firm Size was the statistically significant contributor.

10 selected Indian listed companies over the period FY 2020–21 to FY 2024–25. Effective Tax Rate (ETR) and Interest Tax Shield were considered the principal tax-related explanatory variables, while Return on Assets (ROA), Firm Size and Tangibility were included as control variables.

The study employed descriptive statistics, correlation analysis, multicollinearity testing and panel-data regression analysis. Pooled Ordinary Least Squares (Pooled OLS), Fixed Effects (FE) and Random Effects (RE) models were estimated. The Hausman specification test was then used to determine the preferred panel-data model. Finally, a robustness analysis using company-clustered robust standard errors was conducted to assess the stability of the principal findings.

5.2 Summary of Major Findings

5.2.1 Descriptive Findings

The descriptive analysis indicated considerable variation among the selected companies in terms of taxation, leverage, profitability, firm size and asset tangibility.

The Debt-to-Equity Ratio showed substantial variation across the sample, indicating that the selected companies followed different financing patterns. The differences in the tax-related variables also suggest

that the tax position and potential tax benefits associated with debt financing varied across companies.

Overall, the descriptive statistics demonstrate that capital structure decisions among the selected Indian listed companies were not uniform and were influenced by differences in firm-specific characteristics.

5.2.2 Correlation Analysis Findings

The correlation analysis indicated that ETR had a very weak negative correlation with the Debt-to-Equity Ratio. This suggests little evidence of a strong direct linear relationship between the Effective Tax Rate and leverage.

In contrast, Tax Shield showed a relatively strong positive correlation with the Debt-to-Equity Ratio. This indicates that companies with higher estimated tax shield benefits tended to have higher leverage.

ROA showed a negative correlation with the Debt-to-Equity Ratio, suggesting that more profitable companies may tend to rely relatively less on debt financing.

Firm Size showed a positive correlation with the Debt-to-Equity Ratio, indicating that larger companies tended to have higher leverage.

Tangibility showed only a weak relationship with the Debt-to-Equity Ratio.

The correlation findings provide preliminary evidence of relationships among the study variables; however, correlation alone does not establish statistical significance or causality. The regression analysis was therefore used to examine these relationships after controlling for the other explanatory variables.

5.2.3 Multicollinearity Findings

The Variance Inflation Factor (VIF) test indicated that there was no serious multicollinearity among the explanatory variables.

All VIF values were below 2 and substantially below the commonly used threshold of 5. Therefore, the explanatory variables were not excessively correlated with one another, and the regression coefficients could be interpreted without substantial concern regarding multicollinearity.

5.2.4 Pooled OLS Findings

The Pooled OLS model was estimated as the baseline regression specification using 50 firm-year observations.

The model produced an R^2 of 0.5394, indicating that approximately 53.94% of the variation in the Debt-to-

Equity Ratio was explained by ETR, Tax Shield, ROA, Firm Size and Tangibility. The Adjusted R^2 was 0.4871.

The overall model was statistically significant, with an F-statistic of approximately 10.3061 and a Significance F value of approximately 0.00000138.

Under the Pooled OLS specification, Tax Shield had a positive and statistically significant coefficient of 24.5252 with a p-value of 0.0006. Firm Size also had a positive and statistically significant coefficient of 0.2194 with a p-value of 0.0063.

ETR, ROA and Tangibility were not statistically significant at the 5% level.

The Pooled OLS results therefore provided initial evidence that Tax Shield and Firm Size are positively associated with corporate leverage.

However, because the dataset contains repeated observations for the same companies across multiple years, panel-data models were subsequently estimated to account for company-specific effects.

5.2.5 Fixed Effects Findings

The Fixed Effects model was estimated to control for unobserved, time-invariant characteristics specific to individual companies.

Unlike the Pooled OLS specification, the Fixed Effects model allows the estimated relationship to be examined after accounting for firm-specific characteristics that remain relatively stable over time. The Fixed Effects results showed that none of the five explanatory variables was individually statistically significant at the 5% level.

ETR had a negative coefficient of approximately -0.3850 with a p-value of 0.6231. Tax Shield had a negative coefficient of approximately -38.8913 with a p-value of 0.1342.

ROA had a coefficient of approximately -0.0097 with a p-value of 0.9852, while Firm Size had a coefficient of approximately -0.0757 with a p-value of 0.7693.

Tangibility had a coefficient of approximately -0.1216 with a p-value of 0.8843.

Therefore, none of the explanatory variables demonstrated a statistically significant individual relationship with the Debt-to-Equity Ratio under the Fixed Effects specification.

The differences between the Pooled OLS and Fixed Effects results indicate that accounting for unobserved company-specific characteristics can substantially affect the estimated relationships.

5.2.6 Random Effects Findings

The Random Effects model was estimated as an alternative panel-data specification. The model accounts for company-specific effects while treating these effects as random components.

The Random Effects model produced an R^2 of 0.5394 and an Adjusted R^2 of 0.4871. The overall chi-square statistic was 51.5305 with 5 degrees of freedom and a p-value below 0.001, indicating that the explanatory variables were jointly significant in explaining variation in the Debt-to-Equity Ratio.

Effective Tax Rate

ETR had a coefficient of -0.0557 and a p-value of 0.9364. Although the estimated coefficient was negative, the relationship was statistically insignificant.

Therefore, the study does not find sufficient evidence that ETR has a significant individual relationship with the Debt-to-Equity Ratio.

Tax Shield

Tax Shield had a positive coefficient of 24.5252 and a p-value of 0.0002.

The relationship is statistically significant at the 5% level.

Therefore, the results indicate that higher estimated Interest Tax Shield benefits are positively associated with higher Debt-to-Equity Ratios among the selected companies.

This finding suggests that the tax benefits associated with interest-bearing debt may be relevant to capital-structure decisions.

Return on Assets

ROA had a coefficient of -0.1664 and a p-value of 0.6393.

The negative coefficient suggests an inverse estimated relationship between profitability and leverage. However, the relationship is statistically insignificant. Therefore, ROA does not have a statistically significant individual relationship with the Debt-to-Equity Ratio in the selected sample.

Firm Size

Firm Size had a positive coefficient of 0.2194 and a p-value of 0.0041.

Since the p-value is below 0.05, Firm Size has a statistically significant positive relationship with the Debt-to-Equity Ratio.

This indicates that larger companies in the sample tended to have higher leverage.

Tangibility

Tangibility had a coefficient of -0.2630 and a p-value of 0.3484.

Although the coefficient was negative, the relationship was statistically insignificant.

Therefore, there is insufficient evidence to conclude that Tangibility individually has a significant relationship with the Debt-to-Equity Ratio.

5.2.7 Hausman Test and Model Selection

The Hausman specification test was conducted to determine whether the Fixed Effects or Random Effects model should be preferred.

The test produced the following result:

Statistic	Result
Chi-square	7.8803
Degrees of Freedom	5
p-value	0.1630
Decision	Do not reject H_0
Preferred Model	Random Effects

Since the Hausman test p-value of 0.1630 is greater than the 5% significance level, the null hypothesis is not rejected.

Therefore, there is insufficient evidence that the Random Effects estimates are systematically inconsistent.

The Random Effects model is therefore selected as the preferred panel-data model.

Consequently, the principal hypothesis-testing conclusions of the study are based on the Random Effects estimates.

5.2.8 Robustness Test Findings

To examine the stability of the selected Random Effects results, the model was re-estimated using company-clustered heteroscedasticity-robust standard errors.

The robustness analysis produced the following results:

Variable	Coefficient	Robust p-value	Result
ETR	-0.0557	0.9320	Not Significant
Tax Shield	24.5252	0.00001	Significant
ROA	-0.1664	0.2162	Not Significant
Firm Size	0.2194	0.0065	Significant
Tangibility	-0.2630	0.2336	Not Significant

The robustness results confirm that the principal findings remain stable.

Tax Shield continues to have a positive and statistically significant relationship with the Debt-to-Equity Ratio. Firm Size also remains positive and statistically significant.

ETR, ROA and Tangibility remain statistically insignificant.

Therefore, the main findings are not materially altered when robust standard errors are used.

This strengthens confidence in the conclusion that Tax Shield and Firm Size are important variables associated with leverage in the selected sample.

5.2.9 Joint test of Profitability and Firm Size

A joint hypothesis test was conducted to examine whether ROA and Firm Size are jointly significant in explaining the Debt-to-Equity Ratio.

The test produced:

- Chi-square = 9.856

- Degrees of freedom = 2
- p-value = 0.007241

Since the p-value is below 0.05, the null hypothesis is rejected.

Therefore, ROA and Firm Size are jointly significant in explaining capital structure.

However, this result should be interpreted carefully. ROA is statistically insignificant when considered individually, while Firm Size is individually significant.

Thus, the joint test does not mean that both variables are individually significant. Instead, it indicates that the two variables considered together provide statistically significant explanatory information regarding capital structure.

5.3 Hypothesis Testing

The final hypothesis-testing results based primarily on the selected Random Effects model are presented below.

Table 5.1: Final Hypothesis Testing Results

Hypothesis	Statistical Evidence	p-value	Decision	Conclusion
H ₀₁ : Interest Tax Shield has no significant relationship with capital structure.	Tax Shield, RE	0.0002	Reject H ₀₁	Tax Shield has a significant positive relationship with D/E.
H ₀₂ : ETR has no significant impact on debt financing decisions.	ETR, RE	0.9364	Fail to reject H ₀₂	ETR has no significant individual relationship with D/E.
H ₀₃ : Profitability and Firm Size have no significant influence on capital structure.	Joint test	0.007241	Reject H ₀₃	ROA and Firm Size are jointly significant.

INTERPRETATION

H₀₁

The p-value for Tax Shield under the Random Effects model is 0.0002, which is below 0.05.

Therefore, H₀₁ is rejected.

The study provides evidence of a statistically significant positive relationship between Tax Shield and the Debt-to-Equity Ratio.

H₀₂

The p-value for ETR is 0.9364, which is considerably greater than 0.05.

Therefore, H₀₂ is not rejected.

The study does not find sufficient evidence that ETR has a statistically significant individual relationship with capital structure.

H₀₃

The joint test of ROA and Firm Size produced a p-value of 0.007241, which is below 0.05.

Therefore, H₀₃ is rejected.

This indicates that ROA and Firm Size are jointly significant in explaining capital structure. However, Firm Size is individually significant whereas ROA is not individually significant.

5.4 CONCLUSION

The study examined the relationship between corporate taxation and capital structure among 10 selected Indian listed companies using 50 firm-year observations covering FY 2020–21 to FY 2024–25.

The study used the Debt-to-Equity Ratio as the primary measure of capital structure and examined the influence of Effective Tax Rate and Interest Tax Shield, along with ROA, Firm Size and Tangibility as control variables.

The analysis initially estimated a Pooled OLS model and subsequently considered Fixed Effects and Random Effects models to account for the panel structure of the dataset. The Hausman specification test produced a p-value of 0.1630, which is greater than 0.05. Therefore, the Random Effects model was selected as the preferred panel-data specification.

The Random Effects results indicate that Interest Tax Shield has a positive and statistically significant relationship with the Debt-to-Equity Ratio. This suggests that the potential tax benefits associated with interest-bearing debt are relevant to capital-structure decisions among the selected companies.

Firm Size also has a positive and statistically significant relationship with the Debt-to-Equity Ratio, indicating that larger companies tend to have higher leverage in the selected sample.

In contrast, Effective Tax Rate does not have a statistically significant individual relationship with the Debt-to-Equity Ratio. Similarly, ROA and Tangibility do not demonstrate statistically significant individual relationships with leverage.

The joint test of ROA and Firm Size is statistically significant, indicating that these two variables jointly contribute to explaining capital-structure variation, even though ROA is not statistically significant individually.

The robustness analysis further strengthens the findings. After applying company-clustered robust standard errors, Tax Shield and Firm Size remained statistically significant, while ETR, ROA and Tangibility remained statistically insignificant.

Overall, the findings suggest that capital-structure decisions among the selected Indian listed companies are associated with both tax-related benefits and firm-specific characteristics, particularly the Interest Tax Shield and Firm Size. However, the results should be interpreted as statistical associations rather than evidence of direct causality.

5.5 RECOMMENDATIONS

Based on the findings of the study, the following recommendations are proposed.

5.5.1 Consider Tax Benefits in Financing Decisions

Corporate managers should consider the potential tax benefits associated with debt financing when determining the appropriate financing mix.

The results show a statistically significant positive relationship between Tax Shield and leverage. Therefore, firms may consider the tax implications of debt financing as one component of their capital-structure decisions.

However, firms should not increase debt solely to obtain tax benefits. The potential tax advantages should be balanced against interest obligations, repayment requirements and financial risk.

5.5.2 Maintain an Appropriate Debt Level

Companies should maintain an appropriate balance between debt and equity financing.

Although debt financing can provide tax advantages, excessive borrowing can increase financial risk, interest obligations and repayment pressure.

Therefore, firms should evaluate their debt-servicing capacity before increasing leverage.

5.5.3 Larger Firms Should Manage Their Financing Capacity Carefully

The positive and significant relationship between Firm Size and leverage indicates that larger companies tend to use relatively higher levels of debt.

Larger firms may have greater access to external financing and debt markets. However, greater borrowing capacity should not automatically lead to excessive leverage.

Large firms should use their financial strength to maintain an efficient and sustainable capital structure.

5.5.4 Effective Tax Rate Should Not Be Used as the Sole Indicator

The Effective Tax Rate did not show a statistically significant individual relationship with leverage.

Therefore, managers and financial analysts should not rely solely on ETR when evaluating the relationship between taxation and financing decisions.

Other tax-related measures, particularly the tax benefits associated with interest deductions, as well as firm-specific characteristics should also be considered.

5.5.5 Investors should consider Firm-Specific Factors

Investors evaluating corporate capital structures should consider several factors, including:

- Tax-related benefits
- Firm Size
- Profitability
- Debt levels

- Financial risk
- Overall financing strategy

The findings indicate that leverage decisions differ across companies and cannot be fully explained by a single tax or financial variable.

5.6 LIMITATIONS OF THE STUDY

5.6.1 Limited Sample Size

The study is based on 10 selected Indian listed companies and 50 firm-year observations. Therefore, the findings may not be fully generalisable to all Indian listed companies or to companies operating in other countries.

5.6.2 Limited Study Period

The study covers five financial years from FY 2020–21 to FY 2024–25. A longer study period could provide a more comprehensive understanding of changes in taxation and capital-structure behaviour over time.

5.6.3 Limited Number of Variables

The study focuses primarily on ETR, Tax Shield, ROA, Firm Size and Tangibility.

Capital-structure decisions may also be influenced by other factors, including growth opportunities, liquidity, business risk, corporate governance, cost of debt and macroeconomic conditions.

5.6.4 Measurement Limitations

The study uses accounting-based measures and financial ratios to represent taxation and capital structure.

Measures such as ETR and Tax Shield may be affected by differences in accounting treatment, tax adjustments and company-specific reporting practices.

5.6.5 Possible Influence of Unusual Observations

The residual analysis indicated that some observations had relatively large residual values. Such unusual observations may have influenced some regression estimates.

However, the robustness analysis using company-clustered robust standard errors provided additional support for the stability of the principal findings.

5.6.6 Association Does Not Establish Causality

The regression models identify statistical relationships between the explanatory variables and the Debt-to-Equity Ratio.

However, these relationships should not automatically be interpreted as causal relationships. Other unobserved factors may influence both taxation and capital-structure decisions.

5.7 SCOPE FOR FUTURE RESEARCH

5.7.1 Larger Sample

Future research may include a larger number of Indian listed companies across different industries to improve the generalisability of the findings.

5.7.2 Longer Study Period

Future studies may extend the study period to examine whether the relationship between taxation and capital structure changes over longer periods and under different economic conditions.

5.7.3 Additional Variables

Future researchers may include additional variables such as:

- Liquidity
- Growth opportunities
- Business risk
- Cost of debt
- Non-debt tax shields
- Corporate governance
- Macroeconomic variables

5.7.4 Industry-wise Analysis

Future research could compare companies across different sectors to determine whether the relationship between tax benefits and capital structure varies according to industry characteristics.

5.7.5 Advanced Panel-data Methods

Future studies may employ more advanced panel-data methods, including dynamic panel models and other approaches capable of addressing potential endogeneity and examining both firm-specific and time-specific effects.

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