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Financial Structure and Asset Utilization as Determinants of Corporate Performance: A Panel Data Analysis of Indian Listed Automobile Companies

Dr. Arun Boomibalagan

Assistant Professor, Department of Accountancy Guru Nanak College of Arts, Science and Commerce (Autonomous) Sion, G.T.B. Nagar, Mumbai – 400037

Abstract

Financial structure and asset utilisation are crucial determinant of corporate performance and needs to be given considerable attention. Empirical evidence from these emerging economies remains inconclusive. This study seeks to examine the impact of financial structure and asset utilization on the corporate performance of Indian listed automobile companies. Debt Ratio, Equity Ratio and Financial Leverage represent financial structure of the company. Asset Turnover measures asset utilization. Return on Assets (ROA), Return on Equity (ROE), Return on Capital Employed (ROCE) and Net Profit Margin (NPM) are used as a performance evaluation tool. The study utilizes panel data comprising 80 firm-year observations from eight Indian listed automobile companies, covering the financial year 2017-2026. Descriptive statistics, Pearson correlation analysis, Variance Inflation Factor and panel data regression techniques including Fixed Effects and Random Effects models, are used to analyse the data. Hausman specification test is used to determine the appropriate estimation model. The findings indicate that asset utilization is the most consistent determinant of corporate performance, exhibiting a positive and statistically significant influence on Return on Equity and Return on Capital Employed. Financial structure variables, including Debt Ratio, Equity Ratio and Financial Leverage, do not exhibit statistically significant effects concluding corporate performance is highly influenced by asset utilisation rather than financial structure. This study contributes to the literature on corporate finance and management by presenting panel data evidence on the joint impact of financial structure and asset utilization on corporate performance within the automobile industry in India.

Keywords: Financial Structure, Asset Utilization, Corporate Performance, Panel Data Analysis, Financial Leverage.

1. Introduction

Corporate success depends on corporate performance, which reflects a firm's ability to generate sustainable profitability. The firms must efficiently utilise their available resources to maintain long-term growth and competitiveness. Financial structure, which represents the composition of debt and equity financing, directly influences a firm's cost of capital, financial flexibility, and risk profile. At the same time, asset utilisation demonstrates the management's capability to efficiently employ the firm's assets in generating sales and boosting profit. The financial performance of the business organisations depends on these two dimensions.

The automobile industries in India highly contributes to industrial production and economic development. The industry is driven by high capital investments with constant technological innovations. In recent years, Indian automobile companies have been experiencing significant challenges due to economic uncertainty and regulatory reforms. In order to face these challenges adoption of appropriate financial structure and proper asset utilisation becomes highly necessary to achieve superior corporate performance.

Several literature's empirical findings showed that the relationship between capital structure and firm performance remained inconsistent across countries, industries, and methodological approaches. Some studies revealed that higher leverage improves profitability, on the other side there is also an argument that excessive debt increases financial risk and adversely affects firm performance. Similarly, efficient asset utilization has generally been associated with improved profitability, however empirical findings of the strength and significance show inconsistent relationship. Hence, there is a requirement of detailed study with adoption of robust methodology for

investigating financial structure and asset utilisation as determinant of corporate performance, particularly in emerging economies such as India.

1.1 Research Problem

However, there is no conclusive evidence on how the structure of financing affects corporate performance despite the extensive research work on corporate finance. Several empirical evidence showed contradictory findings on how debt, equity, and financial leverage affect profitability of firms. In addition, while asset utilization is known to be a key measure of efficiency, the effect that asset utilization has on corporate financial performance has not been clearly shown to exist in all sectors and economic situations. The Indian automobile industry, being characterized by high capital intensity and competition, is one such case where it becomes particularly relevant to study the joint effect of financial structure and asset utilization on corporate performance.

1.2 Research Gap

Existing research have been mostly centered on single dimensions of financial structure like leverage or debt ratio, but have not taken into consideration various other dimensions of finance along with efficiency. Similarly, most of the studies analyse performance of firms based on single indicator of profitability. There are not many studies which take into account Indian listed automobile industry due to its strategic importance for the country's economy. Also, no studies use panel data methods to examine Debt Ratio, Equity Ratio, Financial Leverage, and Asset Turnover with respect to ROA, ROE, ROCE, and NPM, while at the same time controlling for the effect of firm-specific heterogeneity. This study aims at filling the above-mentioned gaps by presenting panel data evidence on the link between financial structure, asset utilisation, and performance of firms from major Indian listed automobile sector.

1.3 Research Objectives

The research has been carried out with following objectives to evaluate the impact of financial structure and asset utilisation on the performance of automobile firms of India that have been listed:

1. To study the effect of Debt Ratio on corporate performance.

2. To study the influence of Asset Turnover on corporate performance.

3. To study the combined effect of Debt Ratio and Asset Turnover on corporate performance.

4. To examine whether the effects of Debt Ratio and Asset Turnover vary across different measures of corporate performance (ROA, ROE, ROCE and NPM).

5. To study the influence of Equity Ratio on corporate performance.

6. To study the effect of Financial Leverage on corporate performance.

1.4 Contribution of the study

This study contributes by examining financial structure and asset utilization using multiple accounting-based measures of corporate performance. In contrast to most other studies, which have used only single measure of leverage or profitability, the current study uses Debt Ratio, Equity Ratio, Financial Leverage, and Asset Turnover as the explanatory variables, and their impact on ROA, ROE, ROCE and NPM is analysed via panel data techniques. These results will be useful to provide new empirical evidence from the Indian automobile industry that will offer valuable insights for various stakeholders viz. managers, investors and policy makers regarding financing decisions and operational efficiency.

2. Literature Review

Singh (2025) undertook an investigation of the impact of ownership structure and cash holdings on the corporate financial performance of non-financial firms in India. The research used panel data pertaining to 78 non-financial firms for a duration of 6 years. The authors revealed that the ownership of promoters plays a role of a positive moderator of the linkage between cash holdings and corporate financial performance, whereas the role of

institutional ownership is of a negative nature. The findings are compliant with the agency theory and show the necessity of ownership concentration and sufficient cash management in coping with agency problems.

Ruhil et al. (2025) carried out a study focusing on what factors determine capital structure in the Indian automobile industry in the post-financial crisis era. The major outcome of the study was finding firm size, tangibility of assets, growth opportunities, capacity to service a loan, and liquidity of the funds as the main determinants of capital structure in the Indian automobile industry. The study also verified the adequacy of the predictions of the trade-off and pecking order theories regarding corporate financing. Both theoretical frameworks were found to have strong predictive power, although the degree of significance of each theory depends on specific attributes of firms and financial situation of companies. The study concludes that decisions about capital structure in Indian automobile companies rely more on various financial factors than on particular theoretical approach.

Tejasmayee et al. (2025) focused on the role of circular economy (CE) practices in the operational performance of 31 Indian automobile companies between 2012 and 2023. Circular economy (CE) practices were assessed through the sales of scrap materials. The operational performance of the automobile firms was measured via the use of inventory and revenue. The results of the analysis indicated that the sales of scraps have a significant positive influence on both revenue and inventory, which shows that the application of circular economy concepts leads to improvement in operational performance of the automobile firms.

Vellimuthu et al. (2025) investigated the impact of internal carbon pricing (ICP) disclosure on the financial performance of Indian listed companies using Panel-Corrected Standard Errors (PCSE) and two-stage least squares (2SLS) estimation. Firm performance was measured using ROA, ROE, ROCE, and EPS. The findings showed that ICP disclosure had a significant positive effect on ROA, ROE, and EPS, while its impact on ROCE was positive but statistically insignificant. The study concluded that internal carbon pricing enhances corporate accountability and contributes to improved financial performance in emerging markets.

Jyoti Kumari and Gourishankar S. Hiremath (2025) studied the influence of capital structure on the performance of 17,284 non-financial companies in India from 2009-2023. The study used both static panel models such as Ordinary Least Squares, Fixed Effects, and Random Effects, in combination with a dynamic panel estimation technique – System GMM, based on trade-off, agency and pecking order theories, to solve for business heterogeneity, persistence and endogeneity. The performance of the business was evaluated with the use of ratio such as return on assets (ROA) and return on equity (ROE), with capital structure defined through debt-to-equity ratio. As it turned out from the statistical data analysis, the relationship between leverage and performance resembles an inverted U-shape. It suggests that while moderate amount of debt increases performance due to tax benefits and management discipline, excessive leverage leads to decrease in performance owing to financial distress and agency costs. System GMM results also showed sustainability of this finding taking into account the endogeneity factor.

Sahoo and Yarso (2024) investigated relationship involving capital structure and firm value in Indian automobile as well as ancillary sector with respect to ongoing dilemma with respect to capital structure being optimum. It was concluded that the relationship between leverage and firm value exists with double threshold thus establishing an inverted U-shaped relationship as well whereby debt does not have any positive impact until limits with respect to leverage has been attained, and excessive borrowing has highly negative implications on firm value.

Dutta (2023) conducted a study on how capital structure affected the financial performance of Indian firms that do not belong to the finance sector and which were listed in the National Stock Exchange (NSE) during 2010–11 and 2021–22. Panel data from 147 Indian NSE-listed companies from different industries were collected from the Capitaline database. Results from the study demonstrate that capital structure affects the firm performance negatively, indicating that the firm with greater leverage shows poor financial performance. Interestingly, even turnover and asset tangibility did not show much effect on the firm performance. The results demonstrate how agency cost theory works in this case as high debt may lead to rise in agency costs, thereby affecting firm performance negatively.

Potharla et al. (2021) examined the relationship between institutional ownership and earnings management in Indian non-financial companies using panel data analysis. The study found that total institutional ownership,

Domestic Institutional Investors (DII), and Foreign Institutional Investors (FII) significantly reduced earnings management. The monitoring effectiveness of institutional investors varied with information asymmetry and the Price-to-Book Value (PBV) ratio, with DII performing better in firms with high PBV and FII being more effective in firms with low PBV. The authors concluded that institutional ownership strengthens corporate governance by improving financial reporting quality, reducing managerial opportunism, and enhancing corporate transparency.

Seth et al. (2020) assessed how working capital management (WCM) efficiency influences firm success through analysis based on data collected from 212 firms in India during the period ranging from 2008 to 2019. Data Envelopment Analysis (DEA) and Structural Equation Modeling (SEM) methods were used in the research to assess the relation. The results of the research confirmed that leverage, interest coverage, net fixed assets, and asset turnover significantly contribute to WCM efficiency and assist in achieving better results in terms of firm success. At the same time, it was found out that human and structural capital have nothing to do with the working capital management efficiency level. Therefore, it is possible to state that good working capital management is crucial for effective and successful business.

According to Aggarwal and Padhan (2017), the effect of capital structure and firm quality on the firm value of Indian hospitality companies listed in the BSE was studied from 2001 to 2015. The analysis was based on the pooled OLS, fixed effects, and random effects regression models, and the results of the analysis showed that firm quality, capital structure, liquidity, firm size, and economic growth are important factors influencing the firm value. The results showed that the Modigliani–Miller principle does not apply to the Indian hospitality sector, which indicates that the capital structure development influences the firm value.

3. Theoretical Framework

3.1 Overview

According to Corporate Finance principles, a firm's financial performance correlates with the firm's operational efficiency and the firm's financing decisions. Decisions regarding financing influence the way a firm acquires and distributes financial resources. Meanwhile, operational efficiency encompasses the extent to which financial resources are fully utilized to yield financial returns. This research evaluates corporate performance based on financial structure and the firm's capacity to optimally employ its assets. Trade-off Theory, Pecking Order Theory, and Agency Theory, and the Resource-Based View (RBV) provide the most substantial theoretical support. Together, these theories provide a comprehensive explanation of how financing choices and efficient asset management affect firm profitability.

3.2 Trade-off Theory

The Theory of Trade-off, proposed by Kraus and Litzenberger in 1973, represents the view that firms establish an optimal financing structure when comparing the advantages of financing through debt with the disadvantages of financial distress and bankruptcy caused by it. According to this theory, debt financing has tax advantages because interest payments are tax-deductible, increasing the value of a company. On the one hand, too much debt increases the exposure to risks associated with financial distress and creates chances of bankruptcy, which may have consequences for the performance of a firm.

According to the theory, companies with an optimal ratio of debt and equity financing are likely to achieve superior profitability and long-term financial performance. As a result, a number of variables, such as Debt Ratio, Equity Ratio, and Financial Leverage are expected to affect the performance of companies measured in accounting terms such as ROA, ROE, ROCE and NPM.

3.3 Pecking Order Theory

The pecking order theory of Myers and Majluf suggests that firms have a preference of order of how they like to finance their needs. Companies prefer using internal funds over debt financing while the issuance of new equity is the least preferred option as it can give an impression that managers think that the stocks of the firm are overpriced. According to this theory, businesses with high profits utilize less external debt since they have enough internal funds. It follows that the connection of financial ratios and corporate performance is determined by the

presence of internal funds in organizations. Therefore, the theory can efficiently contribute to studying the impact of debt, equity, and financial leverage on profitability.

3.4 Agency Theory

Agency Theory was introduced by Jensen and Meckling in order to clarify the conflicts of interest arising between managers (agents) and owners (principals). Agents are more inclined to act in their own interest that may contradict the interests of the owners. Debt financing can reduce these agency problems by imposing financial discipline on managers through mandatory interest payments and external monitoring by creditors. On the contrary, over-leverage may cause a conflict of interests between the shareholders and the creditors, which raises agency costs. Thus, the company's financial structure may either facilitate or hamper its performance acting adversely to the company's level of debt. This is why Agency Theory allows studying Debt Ratios, Equity Ratios and Financial Leverage from the point of view of profitability.

3.5 Resource-Based View (RBV)

The Barney Resource-Based View states that competitive advantage depends upon efficient use of valuable, rare, inimitable, and non-substitutable resources. Instead of emphasizing financing decisions, RBV points out how firms effectively utilize their tangible and intangible resources to create value.

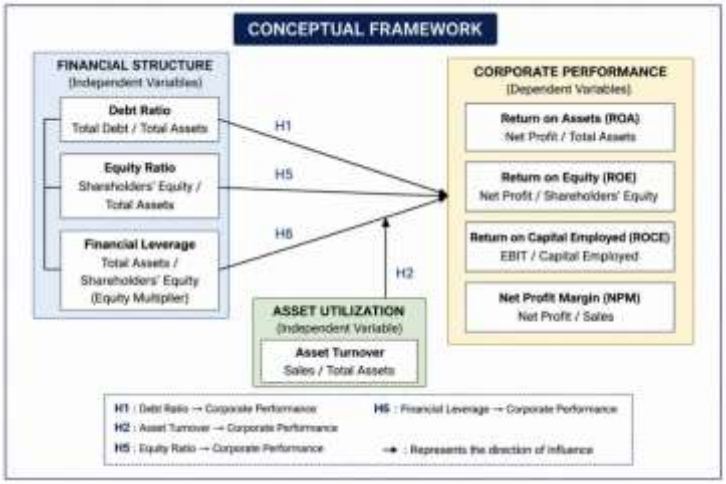
In this study, Asset Turnover serves the function of asset utilization and indicates how efficiently management is able to translate total assets into sales. Higher asset turnover means better use of productive resources and reduced inefficiencies. Consequently, RBV supports the purpose of studying Asset Turnover as a factor influencing corporate performance.

3.6 Integration of Theories

This paper incorporates these four theoretical guidelines to interpret the relationship between financial structure, asset utilization, and corporate performance. Trade-off Theory, Pecking Order Theory, and Agency Theory enable us to describe how financing strategies regarding debt, equity, and leverage can affect profitability. The Resource-Based View theory adds to the existing ones since it clarifies how effective utilization of assets leads to better financial performance. Based on these theories, the following study explores the influence of Debt Ratio, Asset Turnover, Equity Ratio and Financial Leverage on four accounting-based measures of corporate performance, i.e. Return on Assets (ROA), Return on Equity (ROE), Return on Capital Employed (ROCE) and Net Profit Margin (NPM) using the panel data of Indian listed automobile companies.

4. Conceptual Framework

Figure 1. Conceptual Framework of the Relationship between Financial Structure, Asset Utilization, and Corporate Performance.



Source: Developed by the author

5. Hypotheses

The following hypotheses were formulated on the basis of the concepts of Trade-off Theory, Pecking Order Theory, Agency Theory, the Resource-Based View:

H1: Debt ratio significantly influences the corporate performance of Indian listed automobile companies.

H2: Asset turnover significantly influences the corporate performance of Indian listed automobile companies.

H3: Debt ratio and asset turnover jointly explain variations in corporate performance.

H4: The influence of debt ratio and asset turnover varies across alternative performance measures (ROA, ROE, ROCE, and NPM).

H5: Equity ratio significantly influences the corporate performance of Indian listed automobile companies.

H6: Financial leverage significantly influences the corporate performance of Indian listed automobile companies.

6. Research Methodology

6.1 Research Design

This research employs a quantitative, explanatory design of research and aims to assess how financial structure and asset utilization affect corporate performance in publicly listed automobile firms in India.

The use of explanatory design is an ideal approach in the study as it aims to investigate the cause-and-effect relationships between certain financial indicators and several measures of corporate performance through the use of panel data econometric techniques.

6.2 Data Source and Sample Selection

The study is based on secondary data collected from the published annual reports and audited financial statements of eight Indian listed automobile companies. The sample has been chosen using purposive sampling, considering the continuous availability of financial data throughout the study period.

The final balanced panel dataset comprises of 80 observations in firm-year combinations, providing ample observations to capture variations in the corporate performance of firms.

Companies Included in the Study are as follows:

Table 1. Indian Listed Automobile Companies Selected for the Study

Sr. No.	Company Name
1	Maruti Suzuki India Limited
2	Mahindra & Mahindra Limited
3	Bajaj Auto Limited
4	Force Motors Limited
5	Eicher Motors Limited
6	TVS Motor Company Limited
7	Tata Motors Passenger Vehicles Limited
8	Hero MotoCorp Limited

Source: Compiled by the author based on the annual reports of the selected companies and data obtained from the National Stock Exchange (NSE) and Bombay Stock Exchange (BSE).

The study focuses on eight major listed automobile manufacturers in India, selected to represent significant players across the passenger vehicle, two-wheeler, and commercial vehicle segments. The selected firms have substantial market presence within their respective segments, with the passenger-vehicle firms in the sample collectively accounting for approximately 68% of passenger-vehicle retail sales in March 2026, while the selected two-wheeler firms collectively accounted for approximately 63% of two-wheeler retail sales in FY2025–26.

The chosen companies represent the leading players of the Indian automobile industry and meet the following criteria:

- Registered with the Indian stock exchanges during the period of the study.
- Availability of complete financial statements during all study years.
- Consistency in financial reporting.
- Availability of all variables necessary for the empirical analysis.

6.3 Variables of the Study

Dependent Variables

Corporate performance is measured using four accounting-based indicators.

Table 2. Operational Definition of Dependent Variables

Variable	Measurement
Return on Assets (ROA)	Net Profit ÷ Total Assets
Return on Equity (ROE)	Net Profit ÷ Shareholders' Equity
Return on Capital Employed (ROCE)	EBIT ÷ Capital Employed
Net Profit Margin (NPM)	Net Profit ÷ Net Sales

Source: Authors' compilation based on the reviewed literature.

Independent Variables

Financial structure and asset utilization are represented by the following variables.

Table 3. Operational Definition of Independent Variables

Variable	Measurement
Debt Ratio	Total Debt ÷ Total Assets
Asset Turnover	Net Sales ÷ Total Assets
Equity Ratio	Shareholders' Equity ÷ Total Assets
Financial Leverage	Total Assets ÷ Shareholders' Equity

Source: Authors' compilation based on the reviewed literature.

6.4 Econometric Model

To examine the influence of financial structure and asset utilization on corporate performance, the following panel regression model is estimated:

$$\text{Performance}_{it} = \beta_0 + \beta_1 \text{Debt Ratio}_{it} + \beta_2 \text{Asset Turnover}_{it} + \beta_3 \text{Equity Ratio}_{it} + \beta_4 \text{Financial Leverage}_{it} + \varepsilon it$$

where

- Performance_{it}represents ROA, ROE, ROCE, or NPM for firm i in year t;
- $\beta_0$is the intercept;
- β_1–β_4 are regression coefficients;
- ε_{it}denotes the error term.

Separate regression models are estimated for each corporate performance measure.

6.5 Statistical Techniques

Panel data econometric techniques were used to conduct the analysis.

Descriptive Statistics

Descriptive statistics have been applied to give a summary of the characteristics of the variables in terms of mean, median, standard deviation, minimum and maximum values, and quartiles.

Pearson Correlation Analysis

Pearson correlation coefficient is used to check the degree of correlation and direction of linear relationships between study variables and find the potential relationships before regression analysis.

Variance Inflation Factor (VIF)

Variance inflation factor (VIF) is computed to detect multicollinearity in independent variables where the VIF value exceeding the threshold indicates multicollinearity concerns.

Panel Regression Analysis

Panel regression techniques are used since the data set observations are recorded over multiple time period and across various companies.

There are two panel estimators that are estimated:

i) Fixed Effects (FE) Model.

ii) Random Effects (RE) Model.

Such models account for unobserved company-specific effects hence providing more accurate results than pooled least square.

Hausman Specification Test

The Hausman specification test is used for identifying the relevant panel regression model. If the Hausman result is statistically significant, this indicates the preference of the Fixed Effects Model. In case the outcome of the test is found not to be statistically significant, then the Random Effects Model is considered fit.

Diagnostic Tests

Model reliability was assessed using the Breusch–Pagan test for heteroskedasticity, Wooldridge test for serial correlation, Pesaran Cross-sectional Dependence (CD) test and Jarque–Bera normality test.

Entity-Clustered Robust Standard Errors

Based on the diagnostic test results, entity-clustered robust standard errors were applied in the final panel regression models. This approach adjusts standard errors for within-firm dependence and heteroskedasticity, thereby providing more reliable statistical inference and hypothesis testing.

6.6 Hypothesis Testing

The hypotheses are evaluated using the significance of regression coefficients and overall model statistics obtained from the preferred panel regression models.

Table 4. Hypothesis Testing Framework and Decision Criteria

Hypothesis	Statistical Test	Decision Criterion
H1	Panel regression coefficient test (Debt Ratio)	p-value of Debt Ratio
H2	Panel regression coefficient test (Asset Turnover)	p-value of Asset Turnover
H3	Overall F-test (FE) or Wald χ^2 test (RE)	Overall model significance
H4	Comparison of coefficient estimates across ROA, ROE, ROCE and NPM models	Differences in coefficients and statistical significance
H5	Panel regression coefficient test (Equity Ratio)	p-value of Equity Ratio
H6	Panel regression coefficient test (Financial Leverage)	p-value of Financial Leverage

Source: Authors' compilation.

Note: A hypothesis is considered statistically significant when the p-value is less than 0.05.

7. Data Analysis & Results

7.1 Descriptive Statistics

Table 5. Descriptive Statistics of the Study Variables

Variable	count	mean	std	min	25% (Q1)	50% (Median)	75% (Q3)	max
ROA	80	9.592	7.432	-9.396	4.227	9.088	15.897	23.784
ROE	80	16.718	15.011	-47.731	13.22	19.242	23.849	73.745
ROCE	80	19.662	12.217	-5	11	18	28	53
NPM	80	9.215	7.639	-9.513	4.091	8.732	14.635	25.087
Debt Ratio	80	0.192	0.217	0	0.012	0.038	0.411	0.639
Asset Turnover	80	1.046	0.341	0.45	0.817	0.992	1.262	2.034
Equity Ratio	80	0.529	0.25	0.135	0.268	0.648	0.737	0.85
Financial Leverage	80	2.676	1.8	1.176	1.357	1.543	3.737	7.385

Source: Authors' calculations based on data collected from the annual reports of the selected Indian listed automobile companies.

Note: ROA = Return on Assets; ROE = Return on Equity; ROCE = Return on Capital Employed; NPM = Net Profit Margin. Descriptive statistics are based on 80 firm-year observations.

Table 5. presents the descriptive statistics of the study variables. The dataset consists of 80 firm-year observations from eight Indian listed automobile companies. The average ROA is 9.592%, which means that the companies in the sample earned about a 9.6% return on total assets during the period examined. The mean ROE is 16.718%, whereas the average ROCE is 19.662%, implying good returns to shareholders and lenders. The mean Net Profit Margin (NPM) is 9.215%, indicating a moderate level of profitability among the sampled firms.

Among the variables available for analysis, average Debt Ratio measures 0.192, which means that around 19.2% of total assets are financed through debts. The average Asset Turnover is 1.046, which means that companies

generate approximately ₹1.05 in sales for every ₹1 invested in total assets. Average Equity Ratio is 0.529 which means that equity finances approximately 52.9% of total assets. Meanwhile, average Financial Leverage is 2.676 which indicates moderate dependency on debt financing. The overall impact of high standard deviations for ROE and Financial Leverage shows that companies in the sample display considerable heterogeneity in terms of profitability and methods of financing in practice.

7.2 Correlation Analysis

Table 6. Pearson Correlation Matrix of the Study Variables with significance stars

	ROA	ROE	ROCE	NPM	Debt Ratio	Asset Turnover	Equity Ratio	Financial Leverage
ROA	1.000	0.724***	0.883***	0.892***	-0.689***	0.382***	0.717***	-0.678***
ROE	0.724***	1.000	0.550***	0.683***	-0.170	0.240**	0.202*	-0.252**
ROCE	0.883***	0.550***	1.000	0.744***	-0.547***	0.409***	0.587***	-0.535***
NPM	0.892***	0.683***	0.744***	1.000	-0.559***	-0.018	0.642***	-0.597***
Debt Ratio	-0.689***	-0.170	-0.547***	-0.559***	1.000	-0.440***	-0.941***	0.911***
Asset Turnover	0.382***	0.240**	0.409***	-0.018	-0.440***	1.000	0.312***	-0.317***
Equity Ratio	0.717***	0.202*	0.587***	0.642***	-0.941***	0.312***	1.000	-0.937***
Financial Leverage	-0.678***	-0.252**	-0.535***	-0.597***	0.911***	-0.317***	-0.937***	1.000

Source: Authors' calculations based on panel data of selected Indian listed automobile companies (2017–2026).

Note: ROA = Return on Assets; ROE = Return on Equity; ROCE = Return on Capital Employed; NPM = Net Profit Margin. *, **, and *** indicate statistical significance at the 10% ($p < 0.10$), 5% ($p < 0.05$), and 1% ($p < 0.01$) levels, respectively.

Table 6. provides us with the Pearson correlation matrix for the variable of the study. ROA shows a strong correlation with ROCE ($r = 0.883$, $p < 0.01$) and NPM ($r = 0.892$, $p < 0.01$) which indicates that companies having greater ROA report higher efficiency levels and profit margins than the lower ones. There is a negative correlation between Debt Ratio and ROA ($r = -0.689$, $p < 0.01$), ROCE ($r = -0.547$, $p < 0.01$), and NPM ($r = -0.559$, $p < 0.01$) which indicates that the higher use of debt, the lower profitability levels.

Asset Turnover shows a positive and significant relationship with ROA ($r = 0.382$, $p < 0.01$), ROE ($r = 0.240$, $p < 0.05$), and ROCE ($r = 0.409$, $p < 0.01$), suggesting that asset utilization positively affects company performance. Strong correlation of Debt Ratio with Equity Ratio ($r = -0.941$) and Financial Leverage ($r = 0.911$) shows the multicollinearity effect and is examined through the analysis of Variance Inflation Factor (VIF).

7.3 Multicollinearity Test

Table 7. Multicollinearity Diagnostics Using Variance Inflation Factor (VIF)

Variable	VIF	Tolerance (1/VIF)	Interpretation
Debt Ratio	11.76	0.085	Severe multicollinearity
Asset Turnover	1.40	0.714	No multicollinearity
Equity Ratio	13.95	0.072	Severe multicollinearity
Financial Leverage	8.74	0.114	High multicollinearity

Source: Authors' calculations

Note: VIF = Variance Inflation Factor. Tolerance = 1/VIF. A VIF value greater than 10 or a tolerance value less than 0.10 indicates potential multicollinearity.

Table 7. presents the VIF values for the explanatory variables. The VIF number of Asset Turnover is 1.40, meaning no multicollinearity problem takes place. On the contrary, the Debt Ratio has a VIF of 11.76 as well as the Equity Ratio with a VIF of 13.95. Such numbers mean that both variables are considered highly correlated. In the meantime, Financial Leverage has the VIF of 8.74, therefore the multicollinearity level in this case is moderate. These findings imply that the capital structure variables are closely related, which is expected because they are derived from common balance-sheet components. Therefore, the regression results are interpreted with caution.

7.4 Selection of the Appropriate Panel Data Model

Table 8. Hausman Specification Test Results for Model Selection

DV	Hausman Chi^2	df	p-value	Preferred Model
ROA	41.9642	5	0	FE
ROE	7.0303	5	0.2184	RE
ROCE	9.715	5	0.0837	RE
NPM	-15.4729	5	1	RE

Source: Authors' calculations based on panel data of selected Indian listed automobile companies

To determine the appropriate panel regression model, the Hausman specification test was conducted. The test results indicate that the Fixed Effects model is preferred for the ROA model, whereas the Random Effects model is appropriate for the ROE, ROCE, and NPM models. Accordingly, the preferred model for each dependent variable is used for hypothesis testing.

7.5 Panel Regression Results

Table 9: Panel Regression Results for Corporate Performance Models

DV	Variable	Co-efficient	SE	Stat	P-value	Preferred Model	Sig.
ROA	Debt Ratio	-30.693048	20.561925	-1.492713	0.140138	FE	
ROA	Asset Turnover	7.472851	4.292613	1.740863	0.086231	FE	*
ROA	Equity Ratio	-19.379429	15.821197	-1.224903	0.224838	FE	
ROA	Financial Leverage	-0.686812	1.225832	-0.560283	0.577128	FE	
ROE	Debt Ratio	32.898128	30.242845	1.087799	0.280167	RE	
ROE	Asset Turnover	13.23822	6.479684	2.043035	0.044563	RE	**
ROE	Equity Ratio	-10.460287	27.129746	-0.385565	0.70091	RE	
ROE	Financial Leverage	-6.693321	2.80161	-2.389098	0.019404	RE	**
ROCE	Debt Ratio	-11.043332	25.557933	-0.43209	0.666916	RE	
ROCE	Asset Turnover	23.989806	4.885647	4.910262	0.000005	RE	***
ROCE	Equity Ratio	-4.273241	22.182441	-0.192641	0.847761	RE	
ROCE	Financial Leverage	0.278766	1.61127	0.17301	0.86311	RE	
NPM	Debt Ratio	-16.737782	14.86341	-1.126106	0.263711	RE	
NPM	Asset Turnover	-0.476407	2.931324	-0.162523	0.871331	RE	
NPM	Equity Ratio	-4.188192	12.614901	-0.332004	0.740813	RE	
NPM	Financial Leverage	-1.486562	1.023394	-1.452579	0.150512	RE	

Source: Authors' calculations based on panel data of selected Indian listed automobile companies

The panel regression analysis was performed to examine the influence of financial structure and asset utilization on corporate performance. Fixed Effects and Random Effects models were estimated, and the preferred model was selected based on the Hausman test.

The results indicate that Asset Turnover has a positive and statistically significant influence on ROE and ROCE and a marginally significant positive effect on ROA. In contrast, Debt Ratio is statistically insignificant across the preferred models, indicating that debt financing does not consistently influence corporate performance. Equity Ratio exhibits a significant relationship with ROE and ROCE, while Financial Leverage is significant only in the ROE model. No explanatory variable demonstrates a consistent significant relationship with NPM.

7.6 Diagnostic Tests

Table 10. Panel Data Diagnostic Test Results

Diagnostic test	ROA	ROE	ROCE	NPM
Hausman test	41.9642 (p=0.00000006)	7.0303 (p=0.21839330)	9.7150 (p=0.08372684)	-15.4729 (p=1.00000000)
Breusch-Pagan LM test	15.6183 (p=0.00007750)	7.4782 (p=0.00624494)	18.5865 (p=0.00001624)	16.4869 (p=0.00004899)

Breusch-Pagan heteroskedasticity test	10.1533 (p=0.03792329)	18.9724 (p=0.00079582)	8.1699 (p=0.08555030)	11.8789 (p=0.01827506)
Wooldridge serial-correlation test	5.3213 (p=0.02442020)	2.4712 (p=0.12103710)	18.7674 (p=0.00005503)	6.5244 (p=0.01311142)
Pesaran CD test	4.1352 (p=0.00003547)	6.9297 (p=0.00000000)	5.3734 (p=0.00000008)	5.7160 (p=0.00000001)
Jarque-Bera normality test	159.0127 (p=0.00000000)	206.2761 (p=0.00000000)	7.0167 (p=0.02994666)	49.7610 (p=0.00000000)

Source: Authors' calculations based on panel data of selected Indian listed automobile companies

Table 10. presents the diagnostic test results for the panel regression models. The Hausman specification test supported the Fixed Effects model for ROA and the Random Effects model for ROE and ROCE, while the Random Effects model was adopted for NPM because the Hausman statistic was numerically unstable. The Breusch–Pagan LM test confirmed the suitability of panel regression over pooled OLS. The diagnostic tests further revealed heteroskedasticity, serial correlation, cross-sectional dependence and non-normal residuals across the models. Therefore, entity-clustered robust standard errors were employed to ensure reliable statistical inference.

7.7 Final Panel Regression Results with Entity-Clustered Standard Errors

Table 11. Final Panel Models with Entity-Clustered Standard Errors

Variable	NPM	ROA	ROCE	ROE
Asset Turnover	-0.4764 (2.3755) p=0.84159130	7.4729 (5.4070) p=0.17147557	23.9898 (6.1822) p=0.00022230	13.2382 (3.8731) p=0.00102265
Debt Ratio	-16.7378 (18.8614) p=0.37769440	-30.6930 (28.6453) p=0.28773929	-11.0433 (45.5580) p=0.80913068	32.8981 (40.2838) p=0.41670961
Equity Ratio	-4.1882 (15.6198) p=0.78933300	-19.3794 (20.9343) p=0.35786289	-4.2732 (30.8999) p=0.89037960	-10.4603 (48.6258) p=0.83025929
Financial Leverage	-1.4866 (1.4364) p=0.30404470	-0.6868 (1.4797) p=0.64401973	0.2788 (2.4848) p=0.91097415	-6.6933 (5.5853) p=0.23453787

Source: Authors' calculations based on panel data of selected Indian listed automobile companies

Note. Each cell reports the coefficient, entity-clustered standard error in parentheses, and p-value. ROA is estimated using fixed effects; ROE, ROCE, and NPM use random effects.

To address the econometric issues identified in the diagnostic tests, the preferred panel regression models were re-estimated using entity-clustered robust standard errors. The ROA model was estimated using the Fixed Effects estimator, whereas the ROE, ROCE and NPM models were estimated using the Random Effects estimator.

The results show that Asset Turnover is the most consistent determinant of corporate performance, with a positive and statistically significant effect on ROCE ($\beta = 23.9898$, $p = 0.0002$) and ROE ($\beta = 13.2382$, $p = 0.0010$), but

not on ROA or NPM. In contrast, Debt Ratio, Equity Ratio and Financial Leverage do not exhibit statistically significant relationships with any performance measure after applying entity-clustered robust standard errors.

Overall, the robust panel regression results indicate that operational efficiency, measured by Asset Turnover, has a stronger influence on corporate performance than financial structure, suggesting that effective asset utilisation contributes more consistently to profitability among Indian listed automobile companies.

7.8 Overall Model Significance (H3)

Table 12: Overall Model Significance of the Preferred Panel Regression Models

Dependent Variable	Preferred Model	Overall Test	Test Statistic	Degrees of Freedom	p-value	Decision
ROA	Fixed Effects	F-test	3.486542	4, 68	0.011939	Statistically significant at 5%
ROE	Random Effects	Wald χ^2	95.26096	4	1E-19	Statistically significant at 5%
ROCE	Random Effects	Wald χ^2	23.53463	4	9.9E-05	Statistically significant at 5%
NPM	Random Effects	Wald χ^2	16.56744	4	0.002345	Statistically significant at 5%

Source: Authors' calculations based on panel data of selected Indian listed automobile companies

Since all p-values are less than 0.05, the preferred panel regression models are jointly significant.

7.9 Summary of Hypothesis Testing

Table 13: Summary of Hypothesis Testing

Hypothesis	Statement	Decision	Evidence
H1	Debt Ratio significantly influences the corporate performance of Indian listed automobile companies.	**Not Supported**	Debt Ratio is statistically insignificant for ROA ($p = 0.2877$), ROE ($p = 0.4167$), ROCE ($p = 0.8091$), and NPM ($p = 0.3777$).
H2	Asset Turnover significantly influences the corporate performance of Indian listed automobile companies.	**Partially Supported**	Asset Turnover has a positive and significant effect on **ROE** ($\beta = 13.2382$, $p = 0.0010$) and **ROCE** ($\beta = 23.9898$, $p = 0.0002$), but is insignificant for ROA ($p = 0.1715$) and NPM ($p = 0.8416$).
H3	Debt Ratio and Asset Turnover jointly explain variations in corporate performance.	**Partially Supported**	The overall panel regression models are statistically significant (F-test/Wald χ^2, $p < 0.05$), indicating joint explanatory power. However, only Asset Turnover is individually significant, while Debt Ratio remains insignificant.
H4	The influence of Debt Ratio and Asset Turnover varies across alternative performance measures (ROA, ROE, ROCE, and NPM).	**Supported**	Asset Turnover significantly affects ROE and ROCE but not ROA and NPM, while Debt Ratio remains insignificant across all models, indicating varying effects across performance measures.

H5	Equity Ratio significantly influences the corporate performance of Indian listed automobile companies.	**Not Supported**	Equity Ratio is insignificant for ROA (p = 0.3579), ROE (p = 0.8303), ROCE (p = 0.8904), and NPM (p = 0.7893).
H6	Financial Leverage significantly influences the corporate performance of Indian listed automobile companies.	**Not Supported**	Financial Leverage is statistically insignificant for ROA (p = 0.6440), ROE (p = 0.2345), ROCE (p = 0.9109), and NPM (p = 0.3040).

Source: Authors' calculations based on panel data of selected Indian listed automobile companies

8. Discussion

The present research focused on the impact of finance structure and asset utilisation on the performance of automobile companies. Data from eight major listed Indian automobile companies was studied in this regard for the years 2017-2026. Results highlight that optimum asset utilisation plays greater role in the performance of these companies compared to financial structure, which illustrates that operational efficiency is a more significant factor for making profits for Indian automobile industry than financing decisions.

The results indicate that Debt Ratio does not have a statistically significant influence on any of the four measures of corporate performance (ROA, ROE, ROCE and NPM). Consequently, H1 was not supported. This finding suggests that variations in the proportion of debt financing do not significantly affect the profitability. One possible explanation is that these firms maintain relatively balanced capital structures, thereby reducing the influence of debt financing on overall financial performance.

Unlike Asset Turnover, which has been shown to positively and significantly affect Return on Equity (ROE) and Return on Capital Employed (ROCE), no significant relationship was noted with Return on Assets (ROA) and Net Profit Margin (NPM). Based on these results, hypothesis H2 was partially supported. Overall, the results of the research point out that, to create a higher return for the shareholders and a better return on invested capital, companies must be able to utilize their assets in the best way possible.

The overall significance tests of the preferred panel regression models demonstrate that the explanatory variables jointly explain variations in corporate performance. However, because only Asset Turnover remains statistically significant in the preferred robust models, while Debt Ratio does not, H3 is considered partially supported. This suggests that the explanatory power of the regression models is primarily driven by asset utilisation rather than by financial structure variables. Consequently, improvements in operational efficiency appear to contribute more substantially to corporate performance than changes in financing decisions.

The findings also support H4, confirming that the effects of the explanatory variables vary across alternative performance measures and highlighting the importance of using multiple profitability indicators.

The findings also show that Equity Ratio does not have a significant impact on corporate performance, hence H5 was not supported. Likewise, Financial Leverage does not have any significant impact on the chosen performance factors and H6 was also not supported. These findings indicate that in the Indian automotive industry, variations in equity financing and financial leverage are less important than operational efficiency in terms of profitability. This may relate to the nature of investments done in the automotive industry, as profits depend more on productive assets than on the financing structure.

On the whole, the results suggest that among the variables examined, asset utilization proves to be the most consistent factor influencing corporate performance. While financial structure is still regarded as a significant aspect of financial management, its direct contribution to profitability seems to be limited when controlling for firm-specific effects, heteroskedasticity, and serial correlation through using robust panel estimation methods.

9. Conclusion

The study concludes that efficient asset utilisation has a positive and significant influence on ROE and ROCE, whereas Debt Ratio, Equity Ratio and Financial Leverage do not significantly affect corporate performance. The hypothesis testing results support these findings, with H2, H3 and H4 supported or partially supported, while H1, H5 and H6 were not supported. In conclusion, the results reveal that increasing operational efficiency has a bigger impact on improving the performance of Indian listed automobile companies than changing the structure of finance. The research makes a contribution to the field of corporate finance by providing new evidence based on panel data; this evidence further illustrates the impact of financial structure and asset management on corporate performance by using a number of instruments for measuring performance. Finally, the findings give useful information to managers, investors, and financial analysts and can be utilized by policymakers for improving financial performance and resource efficiency.

10. Practical Implications

The results of the research have significant implications for corporate leaders, investors, financial analysts, lenders, and policy makers in the Indian automotive sector. Since asset utilization has more impact on corporate performance than financial structure, managers have to think about efficiency, utilization, production capacity, inventory, and working capital. Considering that Debt Ratio, Equity Ratio and Financial Leverage do not have a considerable effect on performance, the financial structure should be managed to ensure stability instead of considering it as a major driver of profit. Investors, financial analysts, and lenders need to assess their companies according to the efficiency and utilization of assets in addition to their usual financial indicators. In addition, policy makers should focus on the development of technology, efficiency, and productivity of manufacturing.

11. Limitations

The study focuses on only eight Indian automobile companies over the period covering 2017 to 2026 which can restrict the external validity of the findings. Also, the research focuses on a few variables related to financial structure and asset utilization and does not consider important variables such as corporate governance, ownership structure, R&D, macroeconomic environment, market competition, and ESG. Market-based indicators such as Tobin's Q, Market-to-Book Ratio and stock returns are not considered. Although panel regression techniques effectively address panel data issues, potential non-linear relationships were not examined.

12. Future Research

Future studies can expand this research by utilizing a larger sample of private and public companies from different industries and different countries in order to achieve better generalisability of the results obtained. New variables and performance measures based on stock market information, like Tobin's Q, Market-to-Book Ratio, and stock returns, should provide a more accurate analysis of a company's performance. Furthermore, advanced methods, like dynamic panel models and the Generalized Method of Moments (GMM) can be applied in order to remove the influence of endogeneity and capture the dynamics of relationship between variables.

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