"A Comprehensive Analysis of Financial Health of Selected Indian Automobile Companies: Ratio and DuPont Approach"

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Abstract:

This study analyzes the financial performance of seven leading Indian automobile companies (2019–2024) using Ratio Analysis and the DuPont Model. Findings show Bajaj Auto Ltd leads in financial strength, while Tata Motors Ltd ranks lowest due to high leverage and weak profitability. Net Profit Margin (NPM) and Total Asset Turnover (TAT) significantly impact Return on Equity (ROE), while excessive leverage negatively correlates with profitability. The regression model ($R^2 = 0.925$, $p < 0.000$) confirms NPM and TAT are key ROE drivers. The study highlights profitability and asset efficiency as critical factors for financial success in the automobile sector.

Introduction:

The automobile industry is a highly dynamic and influential sector that plays a vital role in global economic development. As a multifaceted industry, it encompasses various domains such as vehicle manufacturing, technological advancements, supply chain management, and regulatory compliance. Over the years, this sector has witnessed remarkable transformations, adapting to changing consumer preferences, economic fluctuations, and environmental concerns. A critical factor shaping the industry is the PESTLE analysis, which evaluates the external macroeconomic factors that impact its growth and operations. Political influences such as government regulations, trade policies, and subsidies for electric vehicles (EVs) significantly affect production and market expansion. Economic factors, including GDP growth, fuel prices, and exchange rates, directly impact consumer purchasing power and investment trends in the automotive sector. Additionally, social elements such as urbanization, demographic shifts, and brand loyalty shape vehicle demand patterns, pushing manufacturers to innovate and cater to evolving customer expectations.

Technological advancements have revolutionized the industry, with developments in electric vehicles, advanced driver-assistance systems (ADAS), and the integration of the Internet of Things (IoT) driving innovation. Legal factors, including stringent emission norms, safety regulations, and intellectual property rights, further influence manufacturing processes and operational strategies. Environmental concerns, particularly regarding energy consumption, waste management, and regulatory compliance, are compelling automobile manufacturers to adopt sustainable practices and enhance their corporate responsibility efforts. Given the ongoing challenges and opportunities, the automobile sector continues to evolve, embracing digital transformation, alternative energy solutions, and smart mobility systems to achieve long-term sustainability and growth.

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Theoretical framework:

A theoretical framework serves as the foundation for any research study, providing a structured explanation of key concepts, theories, and analytical models. In financial performance analysis, tools like ratio analysis and DuPont analysis play a crucial role in evaluating a company's operational efficiency, profitability, liquidity, and solvency. The automobile industry, being a capital-intensive and competitive sector, relies heavily on such financial assessments to optimize its business strategies and enhance sustainability. Ratio analysis helps in understanding financial strengths and weaknesses through key indicators such as profitability ratios (Gross Profit Ratio, Net Profit Ratio, ROE, ROA, and ROCE), liquidity ratios (Current Ratio and Quick Ratio), solvency ratios (Debt to Equity Ratio, Proprietary Ratio, and Interest Coverage Ratio), and efficiency ratios (Inventory Turnover Ratio, Debtors Turnover Ratio, and Asset Turnover Ratio). These ratios provide valuable insights into a firm's financial health, guiding investors, management, and policymakers in making informed decisions.

DuPont analysis further refines financial evaluation by breaking down Return on Equity (ROE) into three core components: Net Profit Margin (TPM), Total Asset Turnover (TAT), and Equity Multiplier (EM). This model allows for a detailed assessment of profitability, asset utilization, and financial leverage, offering a comprehensive view of an automobile company's financial structure. A high ROE signifies efficient financial management, strong operational performance, and effective capital utilization, making it a key performance metric for stakeholders. By integrating ratio analysis with DuPont analysis, researchers can gain a deeper understanding of financial trends, enabling businesses to improve resource allocation, optimize financial strategies, and enhance overall competitiveness in the global automobile market.

Review of literature:

A review of existing literature on financial performance analysis in the automobile sector highlights the significance of comparative ratio analysis and DuPont analysis as essential tools for evaluating financial health. Anand (2017) conducted a comparative and ratio analysis of Maruti Suzuki India Limited, identifying key financial trends and their implications for decision-making and strategic planning. Bhagyalakshmi and Saraswathi (2019) analyzed ten NSE-listed automobile companies using DuPont analysis, revealing a strong correlation between Return on Assets (ROA) and Equity Multiplier (EM) on Return on Equity (ROE). Their findings underscore the role of management effectiveness and investor efficiency in enhancing profitability. Simlai and Guha (2019) extended the analysis by focusing on financial stability, profitability, and growth across five major Indian automobile firms, using key financial ratios to assess their efficiency in managing stock, receivables, and overall assets.

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Similarly, Kamran (2020) and Kumar (2019) conducted financial ratio analyses of selected Indian automobile manufacturers, highlighting the influence of foreign investment and technological advancements on financial performance. These studies collectively emphasize that an automobile company's financial performance is shaped by its reliance on proprietor funds, interest coverage efficiency, and asset utilization strategies.

Further research by Haralayya and Mallikarjun (2023) reinforced the effectiveness of ratio analysis in evaluating a business's financial dynamics, aiding stakeholders in informed decision-making. Jain et al. (2019) compared the financial performance of Maruti Suzuki and Tata Motors, demonstrating Maruti's stronger profitability, while Jegadeeshwaran and Basuvaraj (2018) examined long-term solvency and profitability trends in Indian automobile firms, advocating for cost-control measures to enhance profitability. Additionally, studies such as Parulekar et al. (2023) and Santhi and Amruthavarshini (2021) expanded on DuPont analysis by incorporating extended financial metrics, offering a deeper understanding of financial structures. Liesz (2002) introduced a modified DuPont model incorporating five financial ratios, emphasizing its practical application in business decision-making. Across these studies, a common finding is that high ROE correlates with effective asset utilization, cost control, and operational efficiency, making DuPont analysis an indispensable tool for assessing financial performance in the automobile industry. These insights provide a strong foundation for future research, helping businesses optimize their financial strategies and improve long-term sustainability.

Research Methodology:

This study conducts a comprehensive financial analysis of India's top seven automobile companies over a five-year period (2019–2024), employing Ratio Analysis and the DuPont Model to assess key financial indicators such as profitability, efficiency, financial leverage, liquidity, and market valuation. By analyzing financial data from secondary sources, this research aims to provide valuable insights into the financial stability and growth trends of leading automobile firms, which will be beneficial for stakeholders, investors, and regulatory bodies in making strategic decisions.

Research Objectives

- To assess the profitability of selected Indian automobile firms using financial ratios.

- To analyze the financial performance of select companies using the DuPont model.

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Research Hypothesis

HO: There is significant a difference in the financial performance of selected automobile companies as evaluated by the DuPont Model.

Data analysis & Findings:

This section presents a comparative ranking of seven leading automobile companies based on their liquidity, profitability, efficiency, and leverage ratios. A lower total score indicates better financial performance.

OVERALL FINANCIAL PERFORMANCE RANKING

COMPANY	TOTAL SCORE (LOWER IS BETTER)	FINAL RANK
Bajaj Auto Ltd	38	1
Eicher Motors Ltd	54	2
TVS Motor Company Ltd	58	3
Maruti Suzuki	59	4
Hero MotoCorp Ltd	59	5
Mahindra & Mahindra	70	6
Tata Motors Ltd	82	7

Bajaj Auto Ltd ranks first, indicating strong financial health, followed by Eicher Motors Ltd and TVS Motor Company Ltd. Tata Motors Ltd ranks last, mainly due to high leverage and weak profitability metrics.

DuPont Analysis of Selected Companies

The DuPont Model breaks Return on Equity (ROE) into three key components:

1. **Net Profit Margin (NPM) 2. Total Asset Turnover (TAT) 3. Equity Multiplier (EM)**

Company	Avg. NPM (%)	Avg. TAT	Avg. EM	Avg. ROE (%)
Bajaj Auto Ltd	15.72	1.17	1.26	22.94
Eicher Motors Ltd	18.44	0.77	1.29	18.00
TVS Motor Company Ltd	4.74	1.81	2.38	20.63
Maruti Suzuki	6.78	1.26	1.34	11.58
Hero MotoCorp Ltd	9.77	1.47	1.40	20.07
Mahindra & Mahindra	5.76	1.00	1.65	10.26
Tata Motors Ltd	-2.42	0.83	2.79	-4.97

Bajaj Auto Ltd exhibits the highest ROE (22.94%), mainly due to its strong NPM (15.72%) and efficient asset turnover (1.17). Eicher Motors Ltd has a high NPM (18.44%) but lower

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TAT (0.77), affecting its overall ROE. Tata Motors Ltd struggled with negative profitability until 2022, recovering in 2023–2024.

Correlation Analysis:

Correlation	NPM	TAT	EM	ROE
NPM	1.00	0.037	-0.794**	0.820**
TAT	0.037	1.00	-0.047	0.525**
EM	-0.794**	-0.047	1.00	-0.607**
ROE	0.820**	0.525**	-0.607**	1.00

NPM and ROE (0.820): Strong positive relationship, indicating that profitability significantly drives shareholder returns. TAT and ROE (0.525): Moderate positive correlation, suggesting better asset utilization improves ROE. EM and ROE (-0.607): Negative correlation, meaning higher financial leverage does not always enhance ROE, potentially due to increased financial risk.

Regression Analysis:
Multiple Regression Model Summary:

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.962[a]	.925	.918	3.75784%	.925	127.119	3	31	.000
a. Predictors: (Constant), EM, TAT, NPM									

Regression Coefficients

		Coefficients[a]					
Model		Unstandardized Coefficients		Standardized Coefficients		t	Sig.
		B	Std. Error	Beta			
1	(Constant)	-24.244	4.396			-5.515	.000
	NPM	1.546	.137	.914		11.292	.000
	TAT	17.308	1.712	.498		10.107	.000
	EM	2.822	1.609	.142		1.754	.089
a. Dependent Variable: ROE							

NPM and TAT have strong positive effects on ROE ($p < 0.05$), with TAT having the highest impact (B = 17.308). EM's impact is weaker (p = 0.089), indicating that excessive leverage does not necessarily enhance ROE. The overall model is statistically significant (p = 0.000, R^2 = 0.925), meaning that 92.5% of ROE variations are explained by NPM, TAT, and EM.

Hypothesis and Outcomes of DuPont Analysis:

H0: There is no significant relationship between Net Profit Margin (NPM), Total Asset Turnover (TAT), and Equity Multiplier (EM) with Return on Equity (ROE).

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H1: There is a significant relationship between NPM, TAT, and EM with ROE, meaning these financial variables influence a company's profitability.

Independent Variable	Coefficient (B Value)	t-Statistic	p-Value	Impact on ROE	Result
Net Profit Margin (NPM)	1.546	11.292	0.000	Strong Positive Impact	Net Profit Margin (NPM) have a strong positive impact on ROE, as their p-values are less than 0.05. This confirms that higher profitability and asset utilization improve shareholder returns.
Total Asset Turnover (TAT)	17.308	10.107	0.000	Very Strong Positive Impact	Total Asset Turnover (TAT) have a strong positive impact on ROE, as their p-values are less than 0.05. This confirms that higher profitability and asset utilization improve shareholder returns.
Equity Multiplier (EM)	2.822	1.754	0.089	Weak Positive Impact	Equity Multiplier (EM) has a weaker influence on ROE, as its p-value (0.089) is greater than 0.05, meaning financial leverage does not significantly affect profitability in this dataset.

Discussion

The financial performance analysis of seven major Indian automobile companies highlights key insights:

Profitability & ROE Performance:

- Bajaj Auto Ltd leads in financial strength, with the highest ROE (22.94%), driven by high NPM (15.72%) and moderate leverage (EM = 1.26).
- Eicher Motors Ltd (18.00% ROE) has high profitability (18.44% NPM) but suffers from low asset turnover (TAT = 0.77).

Leverage & Risk Management:

- Tata Motors Ltd had weak financial performance, with negative ROE until 2023 due to high debt dependency (EM = 2.79).
- TVS Motor Company Ltd showed strong TAT (1.81), leading to a competitive ROE (20.63%), despite lower NPM.

Statistical Significance:

- NPM and TAT are the most critical determinants of ROE, with TAT having the highest impact (B = 17.308).

- High financial leverage (EM) negatively correlates with ROE, indicating that excessive debt increases financial risk rather than improving returns.

Conclusion:

This study confirms that profitability (NPM) and asset efficiency (TAT) are key drivers of ROE, while high leverage (EM) does not necessarily enhance financial performance. Future research should explore external market conditions, industry policies, and operational strategies to further refine financial performance assessments in the automobile sector.

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