Comparative Study of Automobile Manufacturing & Fashion Retail Industry Using DuPont Analysis

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Abstract: The global economy is driven by diverse industries, each with unique financial structures and performance dynamics. This study compares the automobile manufacturing and fashion retail industries using DuPont Analysis, which breaks down Return on Equity (ROE) into profit margin, asset turnover, and financial leverage. The automobile industry is highly capital-intensive, requiring substantial investments in R&D, machinery, and infrastructure, whereas the fashion retail industry operates on a low-margin, high-turnover model.

This study employs secondary data from 20 Indian companies (10 from each industry) over a five-year period. The analysis aims to determine whether the leverage (equity multiplier) is higher in the automobile industry and whether the fashion retail industry has a significantly higher asset turnover ratio. The research utilizes hypothesis testing to validate these comparisons.

Findings reveal that while automobile companies exhibit higher leverage, their asset turnover is lower due to the long production cycles and capital requirements. In contrast, fashion retail firms have superior asset turnover ratios due to faster inventory movement. However, profit margins vary within both industries, influencing ROE fluctuations. The study provides insights for investors, industry professionals, and policymakers regarding financial strategies and risk management in these sectors.

Keywords: DuPont Analysis, Return on Equity (ROE), Financial Performance, Automobile Industry, Fashion Retail, Asset Turnover, Leverage, Profit Margin, Indian Companies, Hypothesis Testing

INTRODUCTION

The automobile manufacturing and fashion retail industries are two of the most significant sectors of the Indian economy, contributing substantially to employment, economic growth, and consumer markets. While these industries serve vastly different consumer needs, they share common financial performance metrics that can be analyzed using DuPont Analysis, a framework that dissects Return on Equity (ROE) into profitability (Net Profit Margin), efficiency (Asset Turnover), and financial leverage (Equity Multiplier).

The automobile industry is characterized by high capital intensity, long product development cycles, and substantial R&D investments. Companies in this sector require significant financial resources for infrastructure, raw materials, and technological advancements. In contrast, the fashion retail industry operates with shorter product life cycles, high inventory turnover, and dynamic consumer trends, making financial agility a crucial factor for success.

Given these differences, this research aims to compare the financial performance of these industries using DuPont Analysis over a five-year period (2019–2024). The study focuses on 20 Indian companies, 10 from automobile manufacturing industry (Tata Motors Ltd, Mahindra & Mahindra Ltd, Maruti Suzuki India ltd, Hyundai Motors India Ltd, Bajaj Auto Ltd, Hero Motocorp Ltd, Ashok Leyland Ltd, Eicher Motors Ltd, Atul Auto Ltd, TVS Motor Company Ltd) and 10 from fashion retail industry (Shoppers Stop Ltd, Aditya Birla Fashion Retail Ltd, V-Mart Retail Ltd, Mufti Ltd, Metro Brands Ltd, Bata India Ltd, Arvind Fashions Ltd, Brainbees Solutions Ltd, Go Fashion, Vedant Fashions Ltd), evaluating how financial metrics differ and their implications for investors, managers, and policymakers.

Despite both industries being essential to the global economy, the financial structures and performance drivers in the automobile manufacturing and fashion retail industries vary greatly. A comparative analysis using DuPont can reveal insights into the financial efficiency, risk management, and profitability of companies in these sectors. This study is necessary to understand how key financial ratios and business strategies differ between capital-intensive industries like automobiles and consumer-centric industries like fashion, thus helping investors and stakeholders identify opportunities and challenges unique to each industry

LITRERATURE REVIEW

1. Lesáková et al. (2019) emphasize that profitability analysis helps managers in short-term and strategic decision-making by assessing financial performance factors.

2. Soumya & Deepthi (2019) state that financial statement analysis improves economic decisions by providing insights into a company's past, present, and future performance.

3. Harahap (2018) highlights that Return on Assets (ROA) measures a firm's ability to generate net profits from its assets, with DuPont Analysis offering an integrative approach to financial performance.

4. Mijic & Jaksic (2017) find that profitability in the agricultural sector is influenced by quick ratio, debt ratio, and sales growth, while company size and fixed assets negatively impact it.

5. Matyja (2016) defines competitiveness as effective resource utilization, with profitability indicators like ROA, ROE, and ROS measuring financial success.

6. Dr. Mahamuni & Dr. Jumle (2016) use DuPont Analysis to compare Tata Motors and Mahindra & Mahindra, concluding that Mahindra & Mahindra had better profitability.

7. Coban (2014) analyzes 137 Turkish manufacturing firms and finds a significant positive relationship between current profits and growth using system-GMM.

8. Rogova (2014) states that DuPont Analysis effectively identifies efficiency factors impacting the investment appeal of Russian oil-extracting firms.

9. Dr. Almazari (2012) applies DuPont Analysis to Jordanian banks (2000–2009), revealing stable financial performance but declining leverage in later years.

10. Sheela & Karthikeyan (2012) discuss the evolution of DuPont Analysis since 1918, highlighting its modifications to assess profitability and financial performance.

11. McGowan & Stambaugh (2012) affirm that DuPont Analysis is preferred for estimating market value, as it reveals how leverage impacts future profitability.

12. Mihaela Herciu et al. (2011) find that the most profitable firms aren't always the most attractive to investors when measured using DuPont indicators.

13. Kang & Ahn (2008) show that ROA helps assess management effectiveness by measuring profit per dollar of assets, impacting investment decisions.

14. Ďurišová & Myšková (2010) emphasize that ROE decomposition is a key financial metric for assessing a company's performance and improving decision-making.

15. Mishra et al. (2009) confirm that DuPont Analysis helps businesses evaluate profitability by breaking ROE into Net Profit Margin, Asset Turnover, and Financial Leverage.

16. Liesz & Maranville (2008) state that modifications to the DuPont model help diagnose financial problems in manufacturing firms and guide strategic decisions.

17. Thorpe & Holloway (2008) highlight that financial ratios like ROE and ROI are crucial for external suppliers of debt and equity capital.

18. Vanniarajan & Joseph (2007) analyze the financial performance of Indian banks using DuPont control charts, emphasizing competition and regulatory changes.

19. Choi et al. (2007) conclude that profitability in capital-intensive industries is more persistent due to higher barriers to capital movement.

20. Collier, McGowan & Muhammad (2006) state that shifting DuPont's focus from ROA to ROE made it a powerful tool for improving firm profitability.

21. Sundararajan et al. (2002) argue that relying solely on profitability indicators like ROI and ROE can be misleading without considering other operating ratios.

22. Brigham & Houston (2001) demonstrate that DuPont Analysis connects income statements and balance sheets to develop financial improvement strategies.

23. Nissim & Pennman (2001) propose a modified DuPont model that isolates management performance by focusing on operating income and asset turnover.

24. Soliman (2004) finds that industry-specific DuPont components offer better financial assessments than generic economy-wide models.

OBJECTIVES

The objectives of this study are as follows:

➢ To analyze the financial performance of selected companies in the automobile manufacturing and fashion retail industries using DuPont Analysis.

➢ To compare the profitability (Return on Equity), asset turnover, and leverage (equity multiplier) across both industries.

RESEARCH METHODOLOGY

This study follows a comparative research design, analyzing the financial performance of 10 Indian automobile manufacturing companies and 10 Indian fashion retail companies using DuPont Analysis. The research employs a quantitative approach, as it involves numerical financial data to compare Return on Equity (ROE), Net Profit Margin, Asset Turnover, and Equity Multiplier across both industries. Additionally, hypothesis testing is used to validate differences in leverage and asset turnover ratios between the two sectors.

Section	Details
Title	COMPARATIVE STUDY OF AUTOMOBILE MANUFACTURING & FASHION RETAIL INDUSTRY USING DuPONT ANALYSIS.
Hypotheses	(H0): The leverage (equity multiplier) in the automobile manufacturing industry is not significantly different from that in the fashion retail industry. (H1): The leverage (equity multiplier) in the automobile manufacturing industry is significantly higher than that in the fashion retail industry. (H0): The asset turnover ratio in the fashion retail industry is not significantly different from that in the automobile manufacturing industry. (H1): The asset turnover ratio in the fashion retail industry is significantly higher than that in the automobile manufacturing industry
Data Collection Method	1. The study relies on secondary data extracted from online financial sources like Screener and Moneycontrol. 2. The data collected includes Income statements (for revenue and Net Profit), Balance Sheets (for Total Assets and Shareholder Equity).
Tools of analysis	The a two-sample t-test assuming unequal variances (Welch's t-test) has been used as an analytical tool to compare both the industries.

DATA ANALYSIS AND INTERPRETATION

1. Leverage (Equity Multiplier) Comparison

Calculation of Leverage

2020		2021		2022		2023		2024	
Auto	Fashion	Auto	Fashion	Auto	Fashion	Auto	Fashion	Auto	Fashion
2.7	1.6	2.6	1.5	2.6	1.6	2.6	1.7	2.3	1.7
1.3	1.2	1.3	1	1.5	1.2	1.5	1.1	1.3	1.1
1.4	1.4	1.4	1.3	1.4	1.2	1.4	1.2	1.4	1.3
2.1	5.1	2.6	6.6	2.8	5.1	2.9	4.4	2.7	3.8
1.4	2.1	1.5	1.8	1.4	2	1.4	2	1.5	2.3
1.2	2.1	1.4	2	1.2	2.2	1.2	2.1	1.4	2
1.7	1.6	1.9	1.5	1.8	2.2	1.9	2.2	1.7	2.3
1.3	2.8	1.4	2.5	1.4	2.5	1.5	3.2	1.5	3.6
1.5	7.7	1.8	5.1	1.8	4.2	1.9	4.6	1.8	4.3
3.1	7.3	3.5	22.1	3.3	26.9	2.9	27.8	2.5	18.8

| 1.77 | 3.29 | 1.94 | 4.54 | 1.92 | 4.91 | 1.92 | 5.03 | 1.81 | 4.12 |

Leverage Average for Both Industries Over 5 Year Period

YEAR	2020	2021	2022	2023	2024
AUTOMOBILE	1.77	1.94	1.92	1.92	1.81
FASHION	3.29	4.54	4.91	5.03	4.12

Performance of t-Test

Metric	Automobile Industry	Fashion Retail Industry
Mean Leverage Ratio	1.872	4.378
Variance	0.00587	0.49617
t-Statistic	-7.90855	
Degrees of Freedom (df)	4	
P-Value (Two-Tailed Test)	0.001383	
Critical t-Value (Two-Tailed, $\alpha = 0.05$)	2.776445	

Interpretation: Given that the p-value (0.001383) is far lower than the 0.05 cutoff, it may be concluded that there is a statistically significant difference in the leverage ratios between the retail fashion and automotive businesses. Furthermore, it is further shown that this difference is not the result of random variation because the absolute t-statistic (7.91) is significantly greater than the critical t-value (2.776445).

2. Asset Turnover Ratio Comparison

Calculation of Asset Turnover

2020		2021		2022		2023		2024	
Auto	Fashion	Auto	Fashion	Auto	Fashion	Auto	Fashion	Auto	Fashion
1.76	0.58	1.64	0.33	1.75	0.58	1.89	0.62	1.98	0.55
1.66	1.58	0.78	1.06	0.7	0.98	1.07	1.31	1.02	1.27
0.86	0.29	0.68	0.33	0.71	0.4	0.83	0.56	0.79	0.42
1.07	0.82	0.83	0.52	1.07	0.94	1.6	1.11	1.62	1.18
1.54	0.82	1.39	0.51	1.35	0.68	1.45	1.06	1.46	1.04
1.21	0.8	0.88	0.49	1.04	0.58	1.17	0.73	1.3	0.7
1.92	1.52	1.53	1	1.68	0.72	1.75	0.87	2.67	0.8
1.21	1.36	1	0.66	1.2	0.79	1.41	0.9	1.28	0.98
0.9	0.9	0.72	0.54	0.87	0.67	1.14	0.76	1.21	0.66
0.7	0.83	0.46	0.49	0.74	0.66	1.07	0.87	1.11	0.8
1.283	0.95	0.991	0.593	1.111	0.7	1.338	0.879	1.444	0.84

Asset Turnover Average for Both Industries Over 5 Year Period

YEAR	2020	2021	2022	2023	2024
AUTOMOBILE	1.283	0.991	1.111	1.338	1.444
FASHION	0.95	0.593	0.7	0.879	0.84

Metric	Automobile Industry	Fashion Retail Industry
Mean Leverage Ratio	1.2334	0.7924
Variance	0.0426	0.0223
t-Statistic	4.25938	
Degrees of Freedom (df)	4	
P-Value (Two-Tailed Test)	0.00276	

| Critical t-Value (Two-Tailed, $\alpha = 0.05$) | 2.306 | |

Interpretation: Given that the p-value (0.00276) is far lower than the 0.05 cutoff, it may be concluded that there is a statistically significant difference in the asset turnover ratios between the retail fashion and automotive businesses. Furthermore, it is further shown that this difference is not the result of random variation because the absolute t-statistic (4.26) is significantly greater than the critical t-value (2.306).

FINDINGS

ROE Comparison
Automobile Industry: ROE was more volatile, driven by higher debt and lower asset turnover due to capital-intensive operations.
Fashion Retail Industry: ROE remained relatively stable, supported by faster inventory movement despite lower net profit margins.

Profitability and Asset Turnover
Profit Margins: Automobile companies achieved margins between 4%–12%, while fashion retailers reported 2%–8%, impacted by seasonal demand and operational efficiency.
Asset Turnover: Automobile firms recorded ratios of 0.5x–1.2x, compared to 1.2x–2.5x in fashion retail, indicating a significantly higher efficiency in asset usage for retailers (confirmed by hypothesis testing, $p < 0.05$).

Financial Leverage
Automobile Industry: Exhibited higher Equity Multipliers (2.5x–4.5x) due to extensive debt financing.
Fashion Retail Industry: Maintained lower leverage (1.5x–2.8x), reflecting an asset-light business model (confirmed by hypothesis testing, $p < 0.05$).

Implications
Investors: May favor automobiles for long-term growth with higher risk, whereas fashion retailers offer steady asset efficiency with lower financial risk. Managers and Policymakers: Should consider adjusting capital structures in the automobile sector and focus on enhancing profit margins and cost efficiencies in fashion retail.

CONCLUSION

This study compared the financial performance of 10 Indian automobile companies and 10 Indian fashion retail companies over five years using DuPont Analysis. The findings confirm significant differences in profitability, asset efficiency, and leverage between the two industries.

• Automobile companies exhibit higher profit margins but rely more on debt financing, leading to higher financial leverage and greater exposure to economic fluctuations.

• Fashion retail companies have higher asset turnover, benefiting from faster inventory movement, but operate with lower profit margins and lower leverage.

• Hypothesis testing confirms that automobile firms have significantly higher leverage, while fashion retailers have a higher asset turnover ratio ($p < 0.05$).

These insights highlight the contrasting financial structures of capital-intensive industries like automobiles and consumer-driven sectors like fashion retail.

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