

“The Trend of profitability and how it effects the solvency variables of the selected Nifty Automobile Companies in India”

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Abstract: The Automobile sector plays a crucial role in contributing India's GDP about 7-8% and this sector provides direct and indirect employment to over 37 million people in India. The present study examines the profitability trends of Nifty Automobile Companies in India over 6 years from April 2019 to March 2024 and assess the effect of profitability on solvency variables. This study used ratio analysis, trend analysis, descriptive statistics, correlation and regression analysis for analysing the financial data. The finding indicates a decline in O.P ratio, N.P ratio, ROA and ROCE from the year 2019-2022 due to many factors such as Covid-19 pandemic, adoption of BS-6 norms in 2020, rising crude oil, raw material price and geopolitical tensions like Russian-Ukraine conflicts. However, after 2022 sector shows wide recovery may be due to efficient utilisation of capital, cost optimization and concentrate on sale efficiency. The Correlation matrix shows a strong positive relationship between operating profit ratio and net profit ratio (0.780) indicating that higher O.P significantly contribute to N.P. The correlation between ROCE and N.P (0.710) suggests efficient capital utilisation. Furthermore, the strongest positive relationship exists between ROA and ROCE (0.873), indicates that companies efficiently utilizing assets tends to achieve higher returns on capital. It also concluded that R value of 0.823 indicates a good relationship meaning these factors are quite a good at explaining the outcome. This analysis helps the investors and shareholders in making informed investment decisions & to ensure long term sustainability and growth in the Nifty Automobile sector.

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I. Introduction:

The Indian Automobile companies plays a crucial role in the nation's economy, contributing over 7.1% to India's GDP (Gross Domestic Product), employment over 35 million people is significantly providing job directly or indirectly (<https://www.financialexpress.com>). The Indian automobile industry contributes about 47% in the country's manufacturing GDP. The Indian Government has introduced various key initiatives to raise the automobile sector; - (a)

FAME Scheme (Faster Adoption and manufacturing of hybrid and electric vehicles) ,(b) PLI Scheme (Production Linked Incentive) ,(c) BS-VI Transition (Bharat Stage-VI) ,(d) AMP (Automotive Mission Plan). The Indian Automobile sector is one of the largest and dynamic in the world, with a bright future propelled by technological advancements, government initiatives and growing domestic & international demand. The continuous move towards electric mobility and sustainable practices will be major development drivers for growth in the upcoming years. The Automobile industry in India is the world's 4th largest by production & valuation as per 2022 statistics. As of 2023, India is the 3rd largest automobile market in terms of sales. By 2030, the Indian Government has committed that 30% of the new vehicle sales in India would be electric (<https://www.ibef.org>). Profitability performance refers to how effectively a company generates profits relative to its revenue, assets, or other financial indicators. The current study analysis the profitability trend of nifty auto mobile companies and relationship between associated variables for the study time period of six years from 2019-2024. This study helps companies to make efficient decisions to enhance profitability and ensure long term sustainability growth. Trend analysis is employed in the current study, which is used to compare financial data overtime to identify the trends.

II.Literature Reviews:

Raju, K.K (2016) determined whether there is any significant difference existed between one variable to another variable and understand their relationship in each other. The data obtained from annual reports spanning from the financial years 2002-03 to 2014-15 for analysing the data, SPSS, paired sample t-test were used. From this research paper, researcher found out that there was a significant difference from one variable to another variable examined.

Simlai and Guha (2019) analysed the profitability position, Liquidity position and solvency position of fine automobile companies namely Tata Motor Ltd., Maruti Suzuki India Ltd., Bajaj Auto Ltd., Mahindra& Mahindra Ltd., hero moto corp. for the time period of 6 years from 2011-

12 to 2016-17 the researcher concluded that gross profit ratio & operating profit was satisfactory expect in Tata motor Ltd. And in this research paper, researcher found that EPS (Earning Per Shares) of all the selected companies was very good which is highly desirable for the Equity Shareholder's point expect in Tata motor Ltd.

Kanagavalli & Devi (2018) evaluate and compare the financial performance of selected three automobile companies for the study time period of 5 years from 2013-17. For analysing the, data ratio analysis technique, ANOVA and multiple regression were used. The researcher found that Bajaj Auto and TVS Motors are satisfactory but hero motor corp. sustained a good position in the market.

Nandani & Patjoshi (2020) investigated the impact of capital structure on the financial efficiency of the top ten automobile companies in India from 2014-15 to 2018-19. Capital structure, which involves the mix of equity and debt, plays a crucial role in determining a firm's financial performance and long-term growth. The research uses financial performance metrics like Net Profit Margin, Return on Equity, Return on Total Assets, and Return on Investment, along with capital structure ratios such as Debt Equity Ratio and Long-Term Debt Equity Ratio. Data is sourced from secondary sources and analyzed using statistical methods including correlation and regression. The study concludes that capital structure significantly influences financial efficiency and should be optimized to enhance shareholder value and minimize capital costs.

Mahajan & Sarkar (2007) compared the financial performance of Indian companies and multinational corporations (MNCs), specifically using data from three Indian firms and two MNCs listed in the PROWESS database. Ten financial ratios are analyzed—four profitability, four liquidity, and two solvency ratios. The performance is assessed by calculating average values and the coefficient of variation for each group. Results show that MNCs perform better in return on assets and interest coverage, while Indian firms excel in return on equity. Data from 2002 to 2006 is also examined to observe trends over time using regression analysis, helping to identify whether a company is on an improvement path based on specific financial ratios. The study highlights key performance differences and trends between Indian firms and MNCs.

Maheswari et. al (2023) compared the financial performance of Tata Motors and Mahindra & Mahindra Ltd (M&M Ltd) in India's automobile industry from 2018 to 2022 using various financial ratios. The analysis is based on secondary data to evaluate profitability, earnings, capital employed, and net sales. Findings reveal that while Tata Motors has high sales, its profit margins are lower due to higher expenses. In contrast, M&M Ltd shows stronger net sales, net profit, earnings per share, and return on capital, indicating better financial health. The study concludes that M&M Ltd outperformed Tata Motors in terms of financial performance during the study period. The research highlights the importance of financial analysis in understanding and improving company performance in the competitive automobile sector.

Moch et. al (2019) explored how liquidity and profitability affect financial distress in companies listed on the Indonesian Stock Exchange (IDX) from 2015 to 2017. It uses tools like the Likelihood Statistic Test (simultaneous and partial) and Altman discriminant analysis to assess data. Metrics such as Current Ratio, Debt to Equity Ratio, and Return on Assets are analysed to evaluate solvency and company stability, revealing significant impacts on performance.

Lumbantobing & Salim (2021) examines how liquidity, profitability, and activity ratios impact stock prices of food and beverage companies listed on the Indonesia Stock Exchange from 2015 to 2019. It uses statistical tools like regression analysis to analysed data from 10 companies. The research finds that liquidity and profitability ratios positively affect stock prices, while activity ratios mediate these effects. Results suggest improving these ratios can boost stock prices, especially for companies with high liquidity and profitability.

The study focuses on the Indian automobile industry, as most existing research were limited to automobile usually limited to just two or ten companies. Rarely studies were conducted on the nifty automobile companies and the conducted studies lack the depth and detailed analyses. The main aim of present study is to examine selected Indian automobile companies' profitability trend. And to assess the effect of profitability on solvency variable of selected automobile companies in India for better understanding current financial situation in this industry there is a need of more detailed and up to date research.

III. Research Methodology

3.1 Data and Sample

In this research paper we have used the secondary sources for data collection such as companies annual reports, websites, journals, newspaper, magazines, and capital line data base. In this study we have taken top 10 nifty auto companies listed on NSE (National Stock Exchange) with highest market value as on 31st January, 2025. The study is conducted for the time period of 2019-2024. Top 10 NSE listed automobile companies are taken on the bases of their market capitalization and data availability for the period of 2019-2024. from the website of NSE and company Annual reports. Name of the top 10 automobile companies which were selected for the current study- Escorts, Ashok Leyland, Hero MotoCorp, TVS Motors, Eicher, Hundai India, Bajaj autos, Tata Motors, Mahindra, Maruti.

This study covers 6 years data from April 2019 to March 2024. During this time period data were systematically collected and analysed to ensure consistency and reliability.

The following tools and techniques were used in the present study for analysing the financial data: Descriptive statistic, Ratio Analysis, Trend Analysis, Correlation Analysis and Regression Analysis.

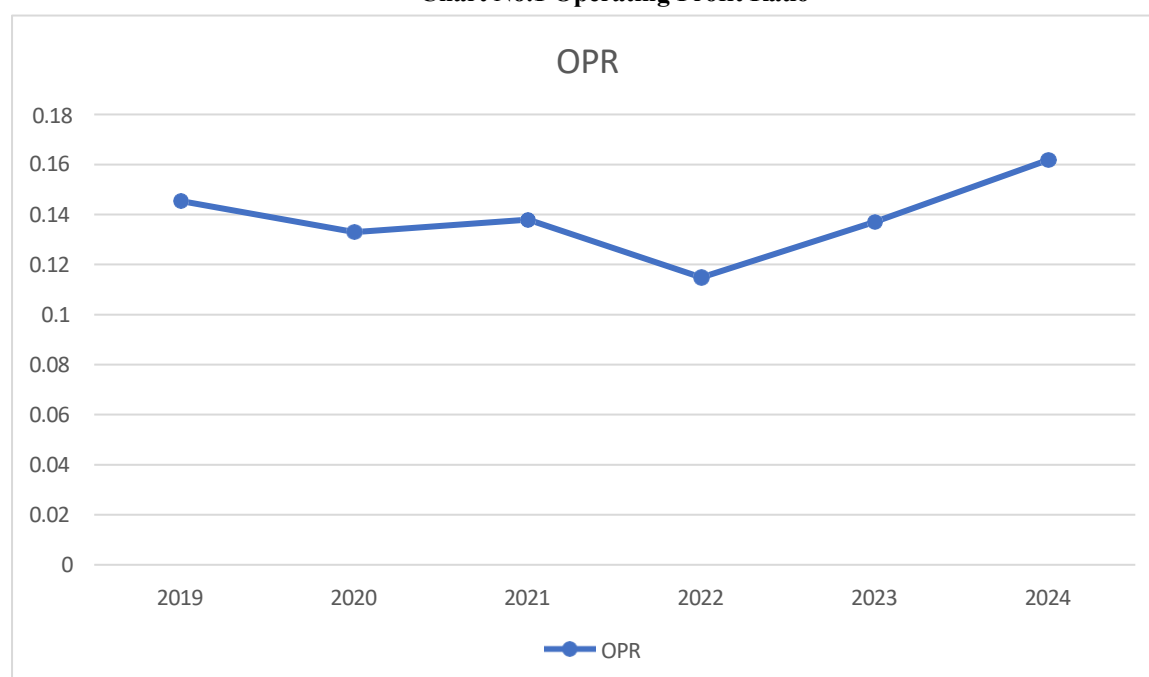
3. Data Analysis and interpretation

Table No.1: Ratio Analysis

Particulars	2019	2020	2021	2022	2023	2024
N.P	0.077855	0.07151	0.065093	0.069249	0.084834	0.107843
O.P	0.145353	0.133009	0.137906	0.114848	0.137025	0.161859
ROA	0.092745	0.082446	0.061825	0.064614	0.084923	0.117483
ROCE	0.201	0.171	0.145	0.145	0.185	0.242

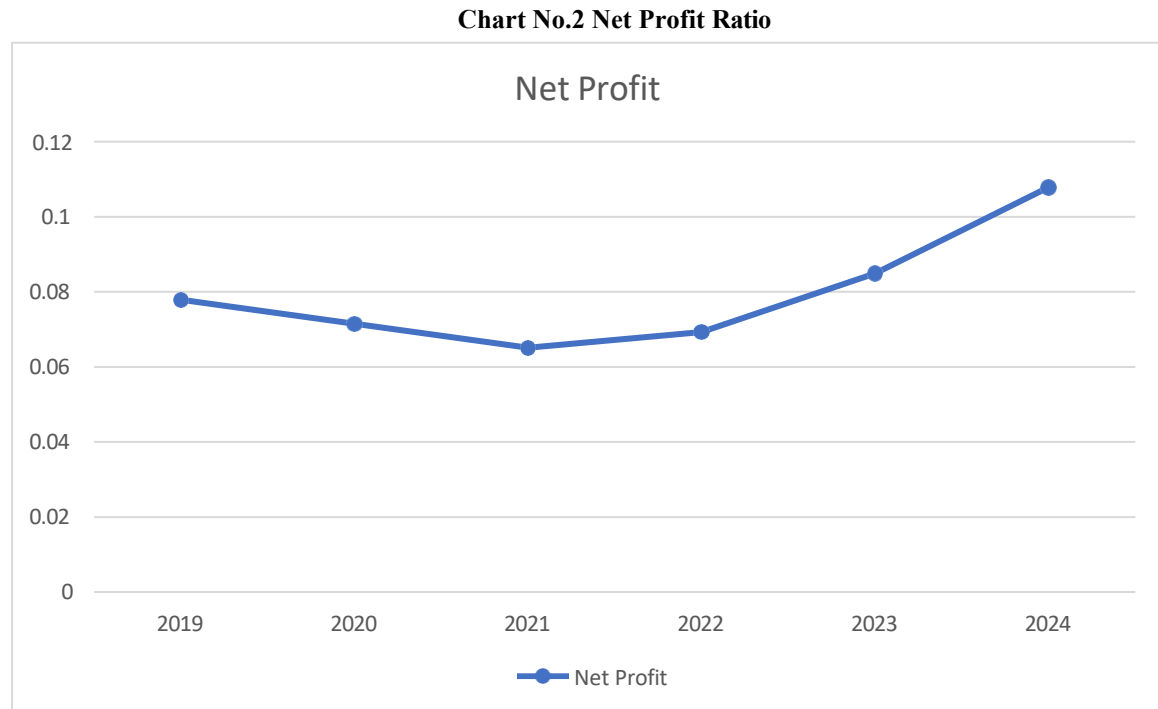
3.1 Trend analysis:

Chart No.1 Operating Profit Ratio



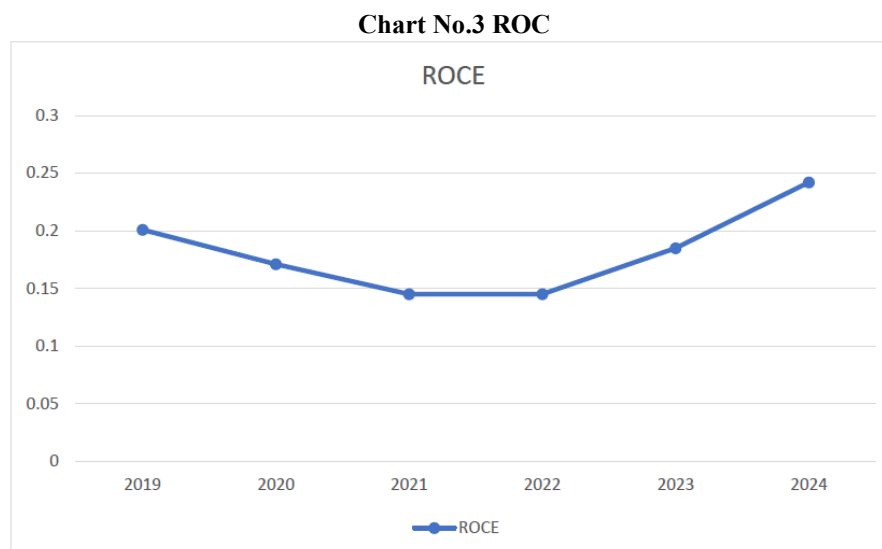
The above chart no.1 represents the trend curve of Operating Profit Ratio shows that in initial stage (2019-2020) it is relatively higher but slightly decline in 2020, from 2022 the chart shows upward trend and continuously improved in 2023,2024. Due to revenue growth, improved profitability, cost deduction or improved efficiency from2022 onwards.

3.2 Trend Analysis of N.P Ratio



The above chart no.2 shows that the Net Profit Ratio decline from 2019-2021 which indicates that profitability reduced during this period. From 2022 onwards the Net Profit Ratio indicates a increase which could be due to improved profitability, better cost management, increased sales or higher operational efficiency.

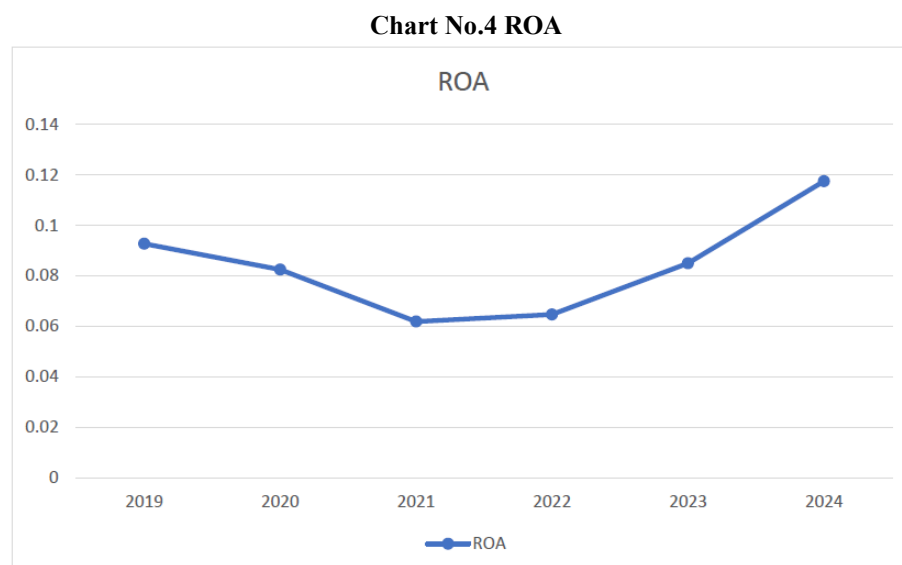
3.3 Trend Analysis of Return On Capital Employed (ROCE)



From the above chart no.3 represents the downward trend from 2019-2021 may be due to companies faced challenges possibly due to low profits, inefficient capital utilization or high capital cost. ROCE starts increasing

from 2022 onwards showing that the companies is improving its capital efficiency and profitability.

3.4 Trend Analysis of ROA



The above chart no.4 represents downward trend from 2019-2021 due to inefficient assets utilization, low earnings or increased costs. The ROA remains downward in 2021-2022 indicates that profitability didn't improve significantly after that ROA shows upwards trend from 2022 onwards showing that companies has improved their profitability and better assets management which is a positive indicator for financial stability and growth.

3.5 Descriptive statistics

Table No.2

Particulars	D/A	D/E	N.P	O.P	ROA	ROCE
Mean	0.4888	1.99488	0.07939	0.14024	0.084006	0.1815
Median	0.4047	0.6799	0.075953	0.13118	0.087657	0.165
Maximum	0.8667	6.50638	0.24195	0.296417	0.23208	0.51
Minimum	0.1495	0.1758	-0.09513	0.065119	-0.09396	0
Std. Dev.	0.27168	2.097	0.069026	0.045385	0.069394	0.106291
Skewness	0.2393	0.7675	0.1255	1.192206	-0.08612	0.55011
Kurtosis	1.2838	2.0422	3.098309	4.8008	2.5843	3.26273
Jarque-Bera	7.9359	8.1842	0.18177	22.3216	0.50607	3.1987
Probability	0.01891	0.0167	0.91312	0.00014	0.7764	0.202
Sum	29.33	119.693	4.763826	8.41484	5.0403	10.89
Sum Sq. Dev	4.354	259.47	0.2811	0.12152	0.28411	0.6665

The above table no.2 represents selected companies or time periods in the Nifty Auto index. For D/A, the average (mean) value is 0.488889, with a median of 0.404731 which suggests a slightly skewed distribution since the mean is higher than the median. The minimum D/A is 0.866780 and the maximum is 1.494883 that shows a wide range. The standard deviation (Std. Dev.) is 0.271686 which indicates a moderate variability and the kurtosis (1.283915) suggests a relatively flat distribution. For D/E, the mean is 1.994883, with a higher median of 0.679915, pointing to a right-skewed distribution. Its range is from 0.605385 to 6.175693, with a standard deviation of 2.097094 that shows a high variability. N.P Ratio has a mean of 0.073397 and a median of 0.075693 which indicates that more balanced distribution. Its range is from - 0.095132 to 0.249157 with a standard deviation of 0.089026. O.P, ROA, and ROCE follow similar patterns, with means of 0.140247, 0.084006 and 0.181500, respectively. Their standard deviations (0.453985 for O.P, 0.086394 for ROA, and 0.169500 for

ROCE) suggests varying levels of spread. Overall, the table shows diverse statistical behaviours across the metrics.

Table No.3: Pearson Correlation Matrix

Particulars	D/A	D/E	N.P	O.P	ROA	ROCE
D/A	1	-	-	-	-	-
D/E	0.94725	1	-	-	-	-
N.P	-0.756471	-0.703813	1	-	-	-
O.P	-0.328401	-0.29250	0.779647	1	-	-
ROA	-0.763185	-0.76011	0.863745	0.52244	1	-
ROCE	-0.563289	-0.585693	0.709925	0.50770	0.873433	1

Table No.3 represents the correlation matrix between the associated variables. Correlations shows how different variables relate to each other. The variables are D/A, D/E, N.P, O.P, ROA and ROCE. Each number in the table represents the strength and direction of the relationship between two variables, ranging from -1 to 1. A value of 1 means a perfect positive relationship (when one goes up, the other does too), -1 means a perfect negative relationship (when one goes up, the other goes down), and 0 means no relationship. D/A and D/E have a strong positive relationship at 0.94725 that means they tends to move together closely. Whereas, D/A and N.P have a negative relationship at -0.756471, so when D/A increases, N.P tends to decrease. O.P and N.P also have a strong positive relationship at 0.779647, while ROA and N.P have a strong negative relationship at -0.863745. ROCE has a negative relationship with most variables, like -0.563289 with D/A and -0.586693 with D/E that means when ROCE goes up, these tends to go down. The strongest positive relationship for ROCE is with O.P at 0.50770. Overall, the above table pf correlation matrix helps us to understand how selected variables influences each other, either moving together or in opposite directions.

Table No.4 Regression Analysis

R	R Square	Adjusted R Square	Std. Error of the Estimate
0.865	0.748	0.730	0.14120

Here, Independent variables were ROCE, ROA, O.P & N.P and Dependent variable is D/A

The above table no.4 shows a very strong correlation where the R-Square value of 0.748 means that about 74.8% of the changes in the model can be determined by the factors included in the model (independent variables). Adjusted R Squared which is 0.730 indicates that it's still a pretty good fit. The S.E of estimate is 0.1412 which shows an average prediction error is low. Overall, this is a well-fitting model with good explanatory power.

Table No.5

R	R-Square	Adjusted R Square	Std. Error of the Estimate
0.823	0.678	0.655	1.23257986

Here, Independent Variables- ROCE, ROA, OP, NP

Dependent Variable- DE

The above table no.5 indicates a strong connection between several factors (ROCE, ROA, O.P, N.P) and a specific outcome (D/A & D/E). The R value of 0.823 indicates a good relationship meaning these factors are quite a good at explaining the outcome. The R-square value of 0.678 suggests that about 67.8% of the changes in the outcome can be determined by these factors. While, the adjusted R-square is 0.655, still indicates a substantial explanation of the data. However, S.E of the estimate is 1.2326 which is relatively high reveals that there is still a considerable amount of error in the prediction. Overall, the model shows a good level of explanation for the dependent variable D/E.

IV. Corporate Policy Implication

Enhancing Profitability and Resilience in the Indian Automobile Sector corporate leaders should consider the following strategic policy directions to ensure sustained growth and investor confidence:

1. Prioritize Operational Efficiency as a Profit Driver

- The strong correlation between operating profit and net profit ratio (0.780) underscores the need to optimize core operations.
- Corporates should implement performance-based budgeting, streamline production processes, and adopt automation to reduce operating expenses and boost margins.

2. Invest in Asset Optimization for Higher Returns

- With ROA and net profit showing a strong positive correlation (0.864), companies must focus on maximizing asset utilization.
- This includes regular asset audits, predictive maintenance, and strategic capital investments that yield higher returns.

3. Strengthen Capital Efficiency Frameworks

- The positive correlation between ROCE and net profit (0.710) suggests that efficient capital deployment enhances profitability.
- Corporates should refine their capital allocation strategies, prioritize high-ROI projects, and monitor working capital cycles to improve ROCE.

4. Build Resilience Against External Shocks

- The downturn from 2019–2022 highlights vulnerability to macroeconomic and regulatory disruptions (e.g., COVID-19, BS-VI norms, geopolitical tensions).
- Companies should establish contingency planning units, diversify supply chains, and maintain financial buffers to withstand future shocks.

5. Align Sales Strategy with Profitability Goals

- The post-2022 recovery was driven by improved sales efficiency and resource utilization.
- Corporates should integrate data-driven sales forecasting, customer segmentation, and digital marketing to enhance revenue generation while controlling costs.

6. Enhance Financial Reporting and Investor Communication

- Transparent reporting of profitability ratios and operational metrics will build investor trust and attract long-term capital.
- Corporates should adopt integrated reporting frameworks and engage in proactive investor relations to showcase financial health and strategic direction.

V. Conclusion

The current study examines the profitability trend of India's top automakers during a six -year period from 2019 to 2024 and analysis the correlation between the variables. This study helps the investors and shareholders to make informed investment decision and to ensure the long- term sustainability& growth. Thus, it was concluded that during the year 2019-2022 all the described ratios of automobile sector shows a downward trend due to many factors such as Covid-19 pandemic, Adoption of B.S-6 in 2020, high crude oil prices, high raw material prices and Russian Ukraine conflict etc. But after 2022 this sector shows a wide recovery may be due to efficient utilization of resources, improve operating expenses and concentrate on sales efficiency, after that all the profitability ratios shows an improvement for year 2022-2024. The corelation matrix shows that the relationship between the operating profit and other variables which is net profit ratio (0.780) indicates a strongly positive correlation that means the operating profit ratio has a significant association with the net profit ratio, while the ROA and ROCE has a moderate positive relation-ship with the operating profit ratio. The relationship between N.P and ROA (0.864) represents a strong positive corelation which means companies with the high net profit has optimised the assets efficiently. While the correlation between ROCE and N.P is 0.710 which shows positive correlation that means companies used their capital efficiently. The relationship between ROA& ROCE is 0.873 that represents a strong correlation which means that companies efficiently use their assets tends to have a good return on capital for their business. The important drawback of the present study was that only it covers a 6-year period, which may not be sufficient to determine long-term profitability trends or cyclical variations in the automobile industry. Events like the COVID-19 pandemic and the Russia-Ukraine conflict had significant impacts on the automobile sector. These extraordinary circumstances may have These unusual events may have affected company performance and could limit the generalizability of the findings. Geographical Scope: The present study only focuses on top automobile companies listed on the Nifty index in India. The findings may not apply to non-Nifty or global automobile companies. The study mostly relies on financial ratios and correlations which don't always capture other important factors or deeper reasons behind changes in company performance.

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