

# An Analytical Study on Ratios Influencing Profitability of Selected Indian Automobile Players

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## ABSTRACT

Every country with a well-developed transportation network has a well-developed economy. The automobile industry is a critical engine of the nation's economic development. The automobile industry has significant backward and forward links with every area of the economy, as well as a strong and progressive multiplier impact. The automotive industry and the auto component industry are both included in the vehicle industry. It includes passenger waggons, light, medium, and heavy commercial vehicles, as well as multi-utility vehicles such as jeeps, three-wheelers, military vehicles, motorcycles, tractors, and auto-components such as engine parts, batteries, drive transmission parts, electrical, suspension and chassis parts, and body and other parts. In the last several years, India's automobile sector has seen incredible growth in sales, production, innovation, and exports. India's car industry has emerged as one of the best in the world, and the auto-ancillary sector is poised to assist the vehicle sector's expansion. Vehicle manufacturers and auto-parts manufacturers account for a significant component of global motorised manufacturing. Vehicle manufacturers from across the world are keeping a close eye on the Indian auto sector in order to assess future demand and establish India as a global manufacturing base. The current research focuses on three automotive behemoths: TATA Motors, MRF, and Mahindra & Mahindra.

**Keywords--** Transportation Network, Multi-Utility Vehicles, Jeeps, Three-Wheelers, Military Vehicles, Motorcycles, Tractors, TATA Motors, MRF, Mahindra & Mahindra

## I. INTRODUCTION

The first automobile was introduced to Indian roads in 1897 on the streets of Mumbai (Bombay). Due to a lack of manufacturing capacity in India, vehicles were directly imported in tiny quantities from other countries until 1930. In 1928, American General Motors formed a fully owned national subsidiary in Bombay to build trucks (CKD) and cars, and in 1930-31, Canadian Ford Motors constructed assembly operations in Mumbai, Calcutta, and Chennai Madras. Hindustan Motors (HM) was established in 1942 to manufacture automobile accessories, with their first vehicle being delivered in 1949. Premier Automobiles Ltd was founded in 1944, and by 1947, it had produced the first

vehicle in India. At the time of independence, both PAL and HM concentrated on passenger automobiles, whereas Mahindra & Mahindra was founded in 1945 with the goal of producing utility vehicles. Under a licence from Piaggio, the Bombay authorities approved a scheme by Bajaj Auto to replace the rickshaw-cycle with an automobile in 1947. On the suggestion of the first Tariff Commission, the two regimes ordered that only firms with a manufacturing programme be allowed to operate in India, excluding organisations that just assemble foreign-made components and those with no Indian partner. Due to nationalisation and the licencing raj, as well as trade limitations on imports that impeded the Indian private sector, overall industrial development was very moderate throughout the 1950s and 1960s. Between the 1970s and 1980s, the automotive sector began to expand, and demand for tractors, commercial vehicles, and scooters increased, albeit to a lesser amount. Only three vehicle manufacturers, Premier Automobiles Ltd, Hindustan Motors Ltd, and Standard Motors Ltd, held entire control of the industry until 1982. The administration allowed foreign innovation and technology to be shared with Indian organisations with or without equitable involvement. With the help of the Indian government, Maruti Udyog Ltd formed a joint venture with Suzuki in 1982 to begin mass manufacture of a variety of new compact vehicle models. In the two-wheeler category, Honda, Kawasaki, Suzuki, and Yamaha are all from Piaggio (Italy) Japan, Honda, and for Zundapp Scooters, Steyr Daimler Puch (ompani), (Germany), and for Mopedes, Agrati Garelli (Italy). The Indian car business has had consistent expansion since the establishment of the new Industrial Policy in 1991, thanks to the removal of restrictions and prohibitions. The License Raj was abolished, which aided the growth of the vehicle industry. In 1997, the automobile industry was buoyed by the government's announcement of a National Highway Policy. Several Indian automakers, including Tata Motors Ltd, Maruti Suzuki Ltd, and M & M Ltd, have expanded their national and international operations. In the year 2000, the Indian government introduced mandatory emission standards in order to safeguard the environment or reduce pollution caused by cars. The 'Bharat Stage' was the name given to these courses of action, which were based on strict European criteria. Bharat-Stage (IV) is now being implemented in thirteen metropolitan communities: Delhi, Ahmedabad,

Pune, Mumbai, Kolkata, Surat, Kanpur, Chennai, Bangalore, Hyderabad, Solapur, and Lucknow, Agra, with the rest of the nation still operating under Bharat-Stage (III) (III). To stimulate domestic manufacture, the Indian government charges a 125 percent import tariff on electric automobiles, while components such as gearboxes and airbags, as well as drive axle parts, are taxed at 10%. In this manner, the levies encourage car manufacturers to construct vehicles in India rather than importing them as fully completed components or vehicles.

## II. REVIEW OF LITERATURE

This research by Mahipat Ranawat and Rajnish Tiwari (2009) attempts to identify policies important to the growth of the Indian motorised sector and also investigates the regime's efforts to expand the business. The development of the Indian locomotive sector can be divided into four phases: first, from 1947 to 1965; second, from 1966 to 1979, guidelines related to sector protection, indigenization, and regulation; third, from 1980 to 1990, liberalisation of technology acquisition; and fourth, from 1991 onwards, liberalisation of direct foreign investment. By supporting or executing government policies and strategies, the Indian car industry emerges as stronger and more progressive.

In their study "The auto Sector in and Beyond the Crises," David Haugh, Annabelle Mourougane, and Olivier Chatal (2010) looked at the issues or crisis faced by the automobile industry, which has been most damaged by the recession. There has been a significant drop in automobile demand and sales. This research examines the automotive sector's position or relevance in the present cycle, as well as short- and medium-term forecasts, as well as policy initiatives, such as the vehicle scrapping programme and the implementation of policies to promote the automobile industry.

The major goal of this investigation, according to Vijayakumar (2011) in his work "The Determinants of Profitability: An Empirical Investigation Using Indian Automobile Industry," is to examine the aspects of profitability in the selected Automobile Industry. For the purpose of study, the automobile industry was divided into three sections: "Business Vehicles, Passenger Cars and Multiutility Vehicles, and Two and Three Wheelers." Following a screening process, 18 firms were chosen, with 5 in the commercial vehicle section, 4 in the passenger car and multiutility vehicle segment, and 9 in the two and three wheeler segment. The secondary data covers the years 1991-1992 through 2003-04. The findings show that size is the most important indicator of profitability in the Indian automobile industry, followed by prior profitability, asset growth rate, vertical

integration, and stock turnover ratio. The research concluded that industry should investigate all of these potential aspects or variables in depth when assessing a company's profitability.

In their article "Impact of Liquidity Ratio on Profitability: An Empirical Study of the Automobile Sector in Karachi," Anzala Noor and Samreen Lodhi (2015) investigate the short-term financial strength of the automobile industry using financial ratios and the impact of liquidity ratio on company profitability. The information was gathered from five auto companies listed on the Karachi Stock Exchange, namely Nissan Ghandhara, Toyota, Pak Suzuki, Honda, and Hino Pak, who gathered information from various sources such as annual financial statements, reports, journal links, and company websites for the previous five years (2010-2014). For regression and significance testing, many descriptive, correlation, and ANOVA methods are used. They use return on asset as an independent variable for the liquidity ratio and return on equity as a dependent variable for the profitability ratio, ratio, and current quick ratio as the outcomes to show that profitability and liquidity have a negative relationship.

## III. SAMPLING DEFINITION

For conducting the present study the researcher has selected three top players in automobile industry of India including TATA Motors, HeroMotor Corporation and Mahindra and Mahindra. The financial data for the same is extracted from CAPITALINE and CMIE for the period of 10 years from 2011-12 to 2020-21 and the relevant statistical tools have been applied

## IV. MULTIPLE REGRESSION ANALYSIS

Multiple Regression Analysis is a statistical method for predicting dependent variables by combining numerous independent variables. It's a functional connection between a dependent variable and many independent factors in which the impact of the independent variables on the dependent variables (profitability) is determined via analysis. The present research used this technique to seek for a new combination of factors that may explain the differences in profitability. In the chosen car industry organisations, Multiple Regression is used using Return on Assets as the dependent variable and all other factors as independent variables. Multiple regression analysis is utilised in this research to determine the link between variables and the factor impacting profitability.

Table 1: Multiple Regression Analysis of the Selected Variables with the Ratio of Current Ratio – Tata Motors

S.No.	Ratio of	Multiple Regression Co-efficient	t' value	p-value
X <sub>1</sub>	Quick ratio	.372	3.130	.014**
X <sub>2</sub>	Interest Coverage Ratio	-.049	-.458	.661
X <sub>3</sub>	Net working capital to sales	.400	3.852	.005**
X <sub>4</sub>	Raw material turnover ratio	.162	1.096	.309
X <sub>5</sub>	Debtors turnover ratio	.082	1.006	.348
X <sub>6</sub>	Creditors turnover ratio	-.179	-2.228	.061
X <sub>7</sub>	Distribution expenses ratio	.146	1.562	.162
X <sub>8</sub>	Miscellaneous expenditure ratio	-.127	-1.693	.134
X <sub>9</sub>	Operating expenses ratio	.119	1.357	.217
X <sub>10</sub>	Net fixed assets turnover ratio	-.523	-5.570	.001*
X <sub>11</sub>	Debt to equity ratio	-.061	-.453	.664
X <sub>12</sub>	Inventory turnover ratio	-.264	-.623	.553

\*\*significant at 5% level. \* Significant at 1% level

## ANOVA

	Sum of Squares	df	Mean Square	F	P	S/NS
Regression	4.872	3	1.624	56.093	.000	S
Residual	.232	8	.029			
Total	5.104	11				

\*\*significant at 5% level. \* Significant at 1% level S- significant NS – Not significant

The table highlights that, the multiple regression co-efficient values of Tata Motors. It projects that two variables are individually contribute significantly to variations in the current ratio when influence of other variables are kept constant. The t and Sig ( p) values give a rough indication of the impact of each predictor variable namely, Net working capital to

sales ratio (t 3.852, p .005, p< 0.05), Net fixed assets turnover ratio (t -5.570, p- 0.017, p< 0.05). In connection with this, the R<sup>2</sup> value in terms of these variables is 95.5percent. Overall ANOVA results, the p-value is less than the 0.01(p<0.01).Hence, this model is statistically significant and these ratios influences profitability more than others.

**Table 2:** Multiple Regression Analysis of the Selected Variables with the Ratio of Current Ratio – Heromotor Corporation

S.No.	Ratio of	Multiple Regression Co-efficient	t' value	p-value
X <sub>1</sub>	Quick ratio	.965	11.694	.000**
X <sub>2</sub>	Interest Coverage Ratio	.065	.767	.463
X <sub>3</sub>	Net working capital to sales	.105	1.030	.330
X <sub>4</sub>	Raw material turnover ratio	-.002	-.019	.985
X <sub>5</sub>	Debtors turnover ratio	.050	.372	.719
X <sub>6</sub>	Creditors turnover ratio	.126	1.263	.238
X <sub>7</sub>	Distribution expenses ratio	-.129	-1.458	.179
X <sub>8</sub>	Miscellaneous expenditure ratio	.027	.285	.782
X <sub>9</sub>	Operating expenses ratio	-.078	-.743	.476
X <sub>10</sub>	Net fixed assets turnover ratio	.013	.132	.898
X <sub>11</sub>	Debt to equity ratio	.025	.278	.787
X <sub>12</sub>	Inventory turnover ratio	-.001	-.017	.987

\*\*significant at 1% level. \* Significant at 5% level

ANOVA

	Sum of Squares	df	Mean Square	F	p-val	S/NS
Regression	.363	1	.363	136.741	.000	S
Residual	.027	10	.003			
Total	.389	11				

\*\*significant at 5% level. \* Significant at 1% level S- significant NS – Not significant

Model Summary

MODEL	R	R SQUARE
1	0.965	0.932

It is clear that, the multiple regression coefficient values of Heromotor Corporation These presented values indicate that one variable is individually contributes significantly to variations in the current ratio when influence of other variables are kept constant. The t and Sig ( p ) values give a rough indication of the impact of predictor variable namely,

Quick ratio (t- 11.694, p 0.00,  $p < 0.01$  ). In connection with this, the  $R^2$  value in terms of these variables is 93.2 percent. Overall ANOVA results, the p-value is less than the 0.01( $p < 0.01$ ).Hence, this model is statistically significant and these ratios influences profitability more than others.

**Table 3:** Multiple Regression Analysis of the Selected Variables with the Ratio of Current Ratio – Mahindra and Mahindra

S.No.	Ratio of	Multiple Regression Co-efficient	t' value	p-value
X <sub>1</sub>	Quick ratio	.015	.325	.756
X <sub>2</sub>	Interest Coverage Ratio	.043	.488	.643
X <sub>3</sub>	Net working capital to sales	.667	9.469	.000*
X <sub>4</sub>	Raw material turnover ratio	.022	.331	.752
X <sub>5</sub>	Debtors turnover ratio	.033	.414	.693
X <sub>6</sub>	Creditors turnover ratio	.434	6.279	.000*
X <sub>7</sub>	Distribution expenses ratio	-.147	-2.379	.049**
X <sub>8</sub>	Miscellaneous expenditure ratio	.281	4.037	.005*
X <sub>9</sub>	Operating expenses ratio	.045	.685	.519
X <sub>10</sub>	Net fixed assets turnover ratio	.005	.075	.943
X <sub>11</sub>	Debt to equity ratio	.001	.009	.993
X <sub>12</sub>	Inventory turnover ratio	-.004	-.054	.959

\*\*significant at 5% level. \* Significant at 1% level

## ANOVA

	Sum of Squares	df	Mean Square	F	P-val	S/NS
Regression	.368	4	.092	165.704	.000**	S
Residual	.004	7	.001			
Total	.371	11				

## Model Summary

MODEL	R	R SQUARE
1	0.995	0.990

It is clear that, the multiple regression co-efficient values of MAHINDRA AND MAHINDRA These presented values indicate that three variables are individually contributing significantly to variations in the current ratio when influence of other variables are kept constant. The t and Sig ( p) values give a rough indication of the impact of each predictor variable namely, Net working capital to sales (t 9.469, p .000 , p< 0.01), Creditors turnover ratio(t 6.279, p .000 , p< 0.01), Distribution expenses ratio(t -2.379, p .049, p< 0.05 ), Miscellaneous expenditure ratio(t 4.037, p .005, p< 0.01). In connection with this, the R<sup>2</sup> value in terms of these variables is 99 percent. Overall ANOVA results, the p-value is less than the 0.01(p<0.01) except Miscellaneous expenditure .Hence, this model is statistically significant and these ratios influences profitability more than others.

## V. SUGGESTIONS

To increase company efficiency, management should strive to maintain optimal working capital, and excess capital should be invested in various securities on a timely basis or used to repay advances and short-term loans. Management should also strive to maintain a balanced credit and collection policy to reduce bad debts.

To strengthen a company's liquidity situation, management should aim to create a cashless system or have a regular cash level to satisfy short-term commitments.

To increase a company's solvency, the management should aim to maintain a balance between debt and equity in order to prevent financial risk or overlook the risk of arranging funding on a regular basis.

## VI. CONCLUSION

During the study period, the researchers wanted to learn about the key ratios that influenced the profitability of Indian automobile companies. According to the findings of this research, each organisation has various financial parameters that contribute to profitability. The finding suggests that in order to

enhance profitability, the firm should focus on its cost of production, fixed asset investment, and sales turnover. In order to enhance profit in the long term, management should aim to keep a tight grip on spending and disbursement costs.

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