



## Factors influencing the financial Performance of Automobile companies in India using Du Pont Model

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### *Abstract*

The factors affecting the performance of the company in terms of profitability, turnover and leverage is illustrated by Du Pont Model. The study focuses on the constituents of DuPont model in the Automobile sector in India. The automobile sector which constitutes around fifty percent of the manufacturing GDP in India is going through a rough phase with differences in effectiveness across the companies in the sector. The Du Pont Analysis distributes the Return on Equity (ROE) into two components –Return on Assets (ROA) and Equity Multiplier (EM).ROA can be further decomposed into Net profit margin (NPM) and Asset Turnover (AT) which are the important financial indicators of the performance of the company. The study exhibits the indicators and calculates the ROE using Du Pont Analysis for a time horizon of 10 years (2010-2019) to determine the effects of these indicators on ROE, PAT and Total sales in the model. Top eight Automobiles companies in India on the basis of their market capitalization are considered into study. The detailed analysis indicating the causal factors influencing the ROE, PAT and the Total sales by using Pearson correlation coefficients is presented in the study.

*Keywords-Du Pont, Return on Equity, Return on Assets, Equity Multiplier*

### **1. Introduction**

The automobile sector is a key indicator of the economy for any country. The Indian automobile industry which constitutes almost fifty percent of the nation's manufacturing GDP is expected to reach Rs 16.16-18.18 trillion by 2026 (IBEF Report). The automobile industry in India is world's fourth largest manufacturer of cars and seventh largest manufacturer of commercial vehicles in 2018 (IBEF report).The sales of Domestic automobiles has increased at 6.71 per cent CAGR between FY13-18 with 26.27 million vehicles being sold in FY19 (IBEF Report). According to data released by Department for Promotion of Industry and Internal Trade (DPIIT) the sector has



attracted Foreign Direct Investment (FDI) worth US\$ 21.38 billion during the period April 2000 to March 2019. Even after demonetization and GST the growth in the passenger vehicles sales grew at a compounded annual growth rate (CAGR) of 3 percent in 2017 as compared to 2016. However the numbers started declining from the beginning of 2018 and reported a single digit growth of 5.32% in the fiscal year 2017-2018. According to the latest report by Siamindia, the sales of domestic commercial vehicles in India are reported to decline in the third quarter of financial year 2020 which is contributing towards the slowdown in the sector. The major companies in the sector-Tata Motors, Ashok Leyland's, Mahindra and Mahindra and Eicher Motors are facing the similar kind of Challenges but the degree of effectiveness of such downturn is distinguishable.

Du Pont analysis provides a comprehensive picture of the performance of the firm by decomposing the different drivers of ROE. It assists the investors in focusing on the key matrices of financial performance of the company and also support in identifying its strength and weaknesses. It provides a better insight to the financial analyst into the areas which needs more attention and focus. The founder of the Du Pont equation Donaldson Brown used this model in 1914 to clear the finances of General Motors. Du Pont equation measures the ROE by the utilization of Profit margin, Asset Turnover and Equity Multiplier. The working efficiency of the firm is measured by the firm's profit Margin while utilization of assets is described by Asset Turnover. The Profit Margin and Asset Turnover are accounting signals measuring the firm's operating efficiency while the equity Multiplier reflects the financial leverage of the firm which is represented as a proportion of average assets to that of shareholders fund. As some constituents of Du Pont model directly represent the profitability of a company, it varies across the industries and also within the industry. The companies adopt different strategies to improve their profitability.

The main aim of this paper is to determine the indicators of the Du Pont Model in eight large automobile companies in Indian Automobile sector and find the influence of these on Profitability (ROE & PAT) and on the Total sales. The concern towards improving the performance of the companies by highlighting the factors responsible for its performance through Du Pont approach is the main driving force of the paper.

## **2.Literature Review**

In the view of ever evolving economy worldwide where the companies are in tough competition for their survival the financial analysis is playing a crucial role in assessing the performance of the firm. According to Iulia Jianu (2001) in "*Assessment, Presentation and Analysis of Enterprise Performance*" Performance is defined as a state of competitiveness that ensures sustainable market presence and indicates the future prospects of the firm. M. Achim (2009) describes Du Pont Analysis as a tool to determine the factors which affect the performance of the enterprise by



breaking down ROE into components and each component or factors interpret the rationale behind the variation in the performance. Nissim & Penman (2001) utilized Du Pont analysis for mapping financial ratios to equity Valuation. By decomposing the Return on Assets into Profit Margin (PM) and Asset Turnover (AT), the author emphasized the major indicators of firm's operations. The Profit Margin reflects the pricing power of the firm which is a combination of brand image, product positioning, and innovation in product and market share. The efficient utilization of available resources is measured by Asset Turnover which signals the efficient use of plant, machineries, inventories and other working capital requirements. Fairfield and Yohn (2001) contends that Profit Margin is less persistent than Asset Turnover. The entry of new participants in the market due to high Profit margin leads to volatility whereas imitating the Asset turnover components for increasing the Profit margin is likely is the result. Penman and Zhang (2003) concludes in the research paper "*Modeling sustainable earnings and P/E ratios using financial statement information*" that Asset turnover is more consistent than Profit margin and the changes in Asset turnover affects the future changes in Return on Assets. In the similar research made by Moss Charles B.(2009) in the work "Decomposing Agricultural Profitability Using DuPont Expansion" finds that the Asset turnover is less important than the Profit Margin as compared to the influence on ROE. Prendergast and Milbourn & Haight (2006) emphasised the study of modified Du Pont Analysis to determine the main factors responsible for the financial performance of a small manufacturing concern. The advance research of Selling and Stickney in 1989 demonstrated the negative relationship between Asset Turnover and Profit Margin. Similar results were shown by Nissam and Penman in 2001 in spite of achieving the desired ROA. The approach of Holthausen and Larcker (1992) to predict the future returns of the stock using the advance Du Pont analysis is a landmark in the literature. Mark. T. Soliman (2008) also contributed towards the explanatory power of asset turnover for the prediction of ROA and assessed the stock market returns in association with the DuPont components. The study states Du Pont model as an important tool for the financial analysis and provides viable information about the profitability of the firm.

The concurrence of efficiency reflecting the optimal use of available resources and effectiveness indicating the appropriate results or remuneration is referred to as the performance of the firm by Monica Patcu (2003).The relation between effectiveness and efficiency in the Romanian market is also shown by V.Muresan which states that the economic profitability is the combination of efficiency and effectiveness. In terms of the components of Du Pont Model, efficiency was referred to Total Assets or Equity and the Net Income or ROE or ROA or AT or EM as the result of the effort by Vasile Burja (2014).

### **3. Research and Methodology**





Du Pont model analyses the fundamental performance by fragmenting the causes of Return on equity (ROE). It provides vital information to the stakeholders in making decisions related to investments which otherwise may be misleading if the components of ROE are not disintegrated. The financial activities which contribute the most to ROE can also be determined through the du Pont model. The formula for ROE is:

$$\text{ROE} = \text{Net Income} / \text{Shareholder's Equity}$$

The Du Pont Analysis modifies ROE into three components-Profit Margin, Asset Turnover and Equity Multiplier. The Du Pont Analysis method renders a higher ROE. If the ROE increases due to increase in Profit Margin and Asset Turnover, it may be considered as a sign of sound Company management while if the reason is the rise in financial leverage the increase in ROE may not be considered a good sign for the company.

$$\text{ROE} = \text{Net Income} / \text{Sales} \times \text{Sales} / \text{Total Assets} \times \text{Total assets} / \text{Shareholder's Equity}$$

$$\text{Net Profit Margin (NPM)} = \text{Net Income} / \text{Sales}$$

$$\text{Asset Turnover (AT)} = \text{Sales} / \text{Total Assets}$$

$$\text{Equity Multiplier (EM)} = \text{Total Assets} / \text{Shareholder's Equity}$$

$$\text{Return on Asset (ROA)} = \text{Net Income} / \text{Total assets}$$

Thus, ROE can be disintegrated into:

$$\text{ROE} = \text{NPM} \times \text{AT} \times \text{EM}$$

Where,

$$\text{ROA} = \text{NPM} \times \text{AT}$$

$$\text{ROE} = \text{ROA} \times \text{EM}$$

To determine the degree of strength between the indicators influencing the performance of the automobile companies, Pearson coefficient correlation is utilized in the first stage. The calculated coefficient correlation 'r' is compared with the critical value from the table of Pearson Correlation for level of significance at 5% which is a popular practice.

#### 4.Data Interpretation and Analysis

##### Eicher Motors



Ratio	Net Income (1)	Net Sales (2)	Total Assets	Total Share Capital	PAT Margin (%)	ROA	ROE	AT	EM
Mar 2010	497.4	5,635.29	3,793.38	26.99	15.57	12.72	17.85	0.82	1.40
Mar 2011	474.85	6,329.94	4,471.48	27	16.77	17.58	24.99	1.05	1.42
Mar 2012	525.38	6,685.75	5,336.59	27.04	12.28	16.03	24.76	1.31	1.54
Mar 2013	701.74	8,598.70	6,407.57	27.1	14.53	22.22	38.42	1.53	1.73
Mar 2014	238.02	1,229.37	987.81	5.43	16.83	30.11	54.4	1.79	1.81
Mar 2016	952.08	4,917.52	3,951.21	21.73	18.75	38.81	73.87	2.07	1.90
Mar 2017	1,523.61	7,003.01	7,009.08	27.21	19.64	31.02	50.42	1.58	1.63
Mar 2018	1,923.16	8,920.86	9,522.23	27.26	18.59	25.69	37.28	1.38	1.45
Mar 2019	1,961.85	9,717.44	11,386.83	27.28	20.98	23.79	33.19	1.13	1.40

**Table1: Du Pont Analysis for Eicher Motors Ltd.**

From Table 1 it is observed that ROE is showing a declining trend from 2016 while the PAT is not showing the similar downward trend. The AT is seen to be following the same a pattern to that of ROE. The PAT on the other hand is seen to be improving over the years except in 2018.

		PAT Margin	ROA	ROE	Asset Turnover	Equity Multiplier	NET INCOME	NET SALES	TOTAL ASSETS	TOTAL SHARE CAPITAL
NET SALES	R <sub>1</sub>	1.000	-0.830	-0.830	-0.946	0.594	0.732	1.000	0.929	0.777
	R <sub>2</sub>	1.000	0.689	0.689	0.895	0.353	0.536	1.000	0.863	0.604
ROE	R <sub>1</sub>	-0.830	1.000	1.000	0.619	-0.065	-0.911	0.530	-0.791	0.051
	R <sub>2</sub>	0.689	1.000	1.000	0.383	0.004	0.830	0.281	0.626	0.003

**Table 2: The calculated Pearson Correlation Coefficient of Du Pont Components for Eicher Motors Ltd.**

According to the Table 2 of Pearson correlation coefficient, Net sales is showing strong positive correlation with Net Income, total assets and Total share capital while strong negative relation is seen with ROA,ROE and Asset Turnover. It is also observed from the table that Net sales are having weak positive correlation with Equity Multiplier. To consider the calculated values of correlation between the indicators, it is important to verify the achievements of materiality (alpha). In this paper we consider the level of significance as  $p < 0.05$ . It is observed from Table 2 that the correlation between Net Sales and Net Income is given by  $R_1=0.732$  and the critical value at degree of freedom (df) =  $10-2= 8$  (10 observations) at  $p=0.05$  is 0.632. The calculated R is greater than the critical value at  $p=0.05$ . Therefore we accept the alternative hypothesis which states a strong positive correlation



between the indicators (Net sales and Net Income) and reject the Null hypothesis. Similarly Net sales and Total assets are also checked with the critical value and found to be statistically significant.

The value of  $R_1^2$  indicates that in 53.6% of cases Net sales increases the Income of the company. The variation in Income is attributed to Net sales in 53.6% of the cases and the other factors contribute 46.4% of the variation. In terms of Total Assets and Total share Capital; an increase in them entails an increase in Net sales in 86.3% and 60.4% of the cases respectively. The inference is that the growth in Equity capital along with increase in investment in company assets increases the Net sales in the company.

Considering the Du Pont Model, the direct correlation of ROE with ROA, Asset Turnover and negatively correlation with PAT margin and Equity Multiplier is observed from Table 2. Though the degree of correlation is weak with Equity Multiplier. This implies that to improve the ROE, the share capital in the total assets should be lowered but is not found to be significant in Eicher case.

### Tata Motors

Ratio	Net Income(cr)	Net Sales(cr)	Total Assets(cr)	Total Share Capital	Profit Margin	ROA	ROE	AT	EM
Mar 2010	2,516.89	91,700.26	87,103.93	570.60	5.84	5.12	16.51	0.88	3.23
Mar 2011	9,220.79	121,420.81	101,014.18	637.71	3.54	3.46	10.37	0.98	3.00
Mar 2012	13,573.91	164,854.52	145,382.64	634.75	2.10	2.29	6.32	1.09	2.76
Mar 2013	9,862.49	187,652.84	170,026.45	638.07	0.61	0.57	1.57	0.93	2.77
Mar 2014	14,104.18	230,677.10	219,998.32	643.78	0.89	0.66	1.75	0.74	2.66
Mar 2015	14,059.65	260,734.33	238,657.99	643.78	-11.99	-9.51	27.88	0.79	2.93
Mar 2016	11,100.72	269,560.11	267,141.15	679.18	-0.13	-0.12	-0.33	0.89	2.80
Mar 2017	6,063.56	265,498.47	273,754.36	679.22	-4.95	-4.21	10.94	0.85	2.60
Mar 2018	6,813.10	288,596.09	331,350.51	679.22	-1.76	-1.75	-5.01	0.99	2.86
Mar 2019	-28,933.70	299,190.59	307,194.53	679.22	2.92	3.36	9.55	1.15	2.84

Table3:Du Pont Analysis for TATA Motors Ltd

		PAT Margin	ROA	ROE	Asset Turnover	Equity Multiplier	NET INCOME	NET SALES	TOTAL ASSETS	TOTAL SHARE CAPITAL
NET SALES	R <sub>1</sub>	1	0.572	0.572	0.995	0.348	-0.294	1.000	0.980	0.876
	R <sub>2</sub>	1	0.327	0.327	0.990	0.121	0.086	1.000	0.960	0.767
TOTAL ASSETS	R <sub>1</sub>	0.572	1.000	1.000	0.638	-0.395	0.362	-0.712	-0.824	-0.531
	R <sub>2</sub>	0.327	1.000	1.000	0.407	0.156	0.131	0.507	0.679	0.282

Table 4: The calculated Pearson Correlation Coefficient of Du Pont Component for TATA



### Motors Ltd.

According to the Table 4 of Pearson correlation coefficient, Net Sales is showing strong positive correlation with total assets and Total share capital. It is also observed from the table that Net sales are having weak positive correlation with Equity Multiplier. To consider the calculated values of correlation between the indicators, it is important to verify the achievements of materiality (alpha). In this paper we consider the level of significance as  $p < 0.05$ . It is observed from Table 2 that the correlation between Net Sales and Total assets is given by  $R_1=0.980$  and the critical value at degree of freedom ( $df = 10-2= 8$  (10 observations) at  $p=0.05$  is 0.632. The calculated R is greater than the critical value at  $p=0.05$ . Therefore we accept the alternative hypothesis which states a strong positive correlation between the indicators (Net sales and Total assets) and reject the Null hypothesis. Similarly Net sales and Total Share capital are also checked with the critical value and found to be statistically significant.

The value of  $R^2$  indicates that in 96% of cases Total assets increases the Net sales of the company. The variation in sales is attributed to total assets in 96% of the cases and the other factors contribute 4% of the variation. In terms of Total share Capital; an increase in them entails an increase in Net sales in 76.7% of the cases.

The inference is that the growth in Equity capital along with increase in investment in company assets increases the Net sales in the company.

Considering the Du Pont Model, the direct correlation of ROE with ROA, Asset Turnover and PAT margin and negative correlation with Net sales, Total assets and Equity Multiplier is observed from Table 4. Though the degree of correlation is weak with Equity Multiplier. This implies that to improve the ROE, the share capital in the total assets should be lowered but it is not found to be significant in Tata Motors case. A positive relationship is seen between PAT and AT, though it is very low, it states that no compromise was done in terms of Profit margin even during the down turn of the economy (2017 to 2019)

### Mahindra and Mahindra

Ratio	Net Income	Net Sales	Total Assets	Total Share Capital	PAT Margin (%)	ROA (%)	ROE (%)	Asset Turnover	Equity Multiplier
Mar 2010	2,516.89	91,700.26	87,103.93	570.6	10.24	13.81	32.07	1.35	2.32
Mar 2011	9,220.79	121,420.81	101,014.18	637.71	10.42	14.92	29.46	1.43	1.97
Mar 2012	13,573.91	164,854.52	145,382.64	634.75	8.38	13.29	25.88	1.59	1.95
Mar 2013	9,862.49	187,652.84	170,026.45	638.07	7.72	13.09	25.3	1.7	1.93
Mar 2014	14,104.18	230,677.10	219,998.32	643.78	8.72	12.8	24.12	1.47	1.88





Mar 2015	14,059.65	260,734.33	238,657.99	643.78	8.17	10.34	18.56	1.27	1.79
Mar 2016	11,100.72	269,560.11	267,141.15	679.18	7.34	9.36	15.47	1.28	1.65
Mar 2017	6,063.56	265,498.47	273,754.36	679.22	7.69	9.69	14.92	1.26	1.54
Mar 2018	6,813.10	288,596.09	331,350.51	679.22	8.81	10	15.38	1.13	1.54
Mar 2019	28,933.70	299,190.59	307,194.53	679.22	8.95	9.58	14.98	1.07	1.56

**Table5 : Du Pont Analysis for Mahindra and Mahindra Ltd.**

		PAT Margin	ROA	ROE	Asset Turnover	Equity Multiplier	NET INCOME	NET SALES	TOTAL ASSETS	TOTAL SHARE CAPITAL
NET SALES	R <sub>1</sub>	1	-0.657	-0.657	-0.035	-0.298	0.572	1.000	0.006	0.718
	R <sub>2</sub>	1	0.432	0.432	0.001	0.089	0.327	1.000	0.000	0.516
ROE	R <sub>1</sub>	-0.657	1.000	1.000	-0.724	0.878	0.193	0.753	-0.619	0.459
	R <sub>2</sub>	0.432	1.000	1.000	0.524	0.771	0.037	0.567	0.383	0.211

**Table 6: The calculated Pearson Correlation Coefficient of Du Pont Component for Mahindra and Mahindra Ltd.**

In the case of Mahindra and Mahindra Ltd. we see that Net Sales is highly correlated with only total share capital and no correlation is seen between sales and Total Assets. It states that equity participation to sales is significant (in 51.6% of cases) and the use of resources in Total asset is insignificant. The Profitability expressed as ROE is showing a declining trend for the years taken into consideration but shows positive correlation with sales, equity multiplier and total share capital referring to the contribution of shareholders towards financing of the company.

**Bajaj Auto**

Ratio	NET INCOME	NET SALES	TOTAL ASSETS	TOTAL SHARE CAPITAL	PAT Marg in (%)	RO A (%)	ROE (%)	Asset Turnover	Equity Multiplier
Mar 2010	1,651.44	11,813.25	8,733.70	144.68	14.06	21.51	73.83	1.53	3.43
Mar 2011	3,339.73	15,896.82	9,247.53	289.37	19.27	34.77	85.21	1.8	2.45
Mar 2012	3,004.05	18,880.27	11,081.07	289.37	14.67	29.55	54.86	2.01	1.86
Mar 2013	3,043.57	19,488.96	12,478.62	289.37	14.41	25.83	43.66	1.79	1.69
Mar 2014	3,243.32	19,717.64	14,747.60	289.37	15.33	23.82	37.05	1.55	1.56





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Mar 2015	2,813.74	21,103.93	15,562.32	289.37	12.49	18.57	27.72	1.49	1.49
Mar 2016	3,929.67	22,151.71	16,486.50	289.37	16.45	24.52	32.8	1.49	1.34
Mar 2017	3,827.56	21,373.52	20,814.89	289.37	16.58	20.52	25.26	1.24	1.23
Mar 2018	4,068.10	24,700.30	23,819.49	289.37	15.88	18.23	22.51	1.15	1.23
Mar 2019	4,675.18	29,567.25	27,380.39	289.37	15.46	18.26	22.87	1.18	1.25

**Table 7 : Du Pont Analysis for Bajaj Auto Ltd.**

		PAT Margin	ROA	ROE	Asset Turnover	Equity Multiplier	NET INCOME	NET SALES	TOTAL ASSETS	TOTAL SHARE CAPITAL
NET SALES	R <sub>1</sub>	-0.005	0.520	-0.832	-0.609	-0.859	0.892	1.000	0.924	0.638
	R <sub>2</sub>	0.000	0.270	0.692	0.371	0.739	0.795	1.000	0.853	0.407
ROE	R <sub>1</sub>	0.321	0.762	1.000	0.676	0.877	-0.629	0.832	-0.835	-0.498
	R <sub>2</sub>	0.103	0.580	1.000	0.457	0.770	0.396	0.692	0.697	0.248

**Table 8: The calculated Pearson Correlation Coefficient of Du Pont Component for Bajaj Auto Ltd .**

The turnover of Bajaj Auto Ltd. expressed as Net sales shows an upward trend during the period taken except in 2017 due to moderation in exports, both in the three wheeler and motorcycle segments (annual Financial Reports). The Net sales is found to be well correlated with Total assets and Net Income signifies that the increase in sales which ultimately increases the Net Income is responsible for the growth of the company. The ROE however is highly correlated with Equity Multiplier and ROA but negatively correlated with sales and Total assets. The slowdown in the two wheeler segment for the company due to lack of innovations led to the decline in ROE despite of infusion of assets in the form of debt to the capital.

ASHOK LEYLAND

Ratio	NET INCOME	NET SALES	TOTAL ASSETS	TOTAL SHARE CAPITAL	PAT Margin (%)	ROA (%)	ROE (%)	Asset Turnover(x)	Equity Multiplier
Mar 2010	424	72.45	9282.04	133.03	5.27	4.89	19.13	0.93	3.91
Mar 2011	631	111.18	10593.31	133.03	5.09	6.31	25.32	1.24	4.01
Mar 2012	566	12,904.33	1191.57	266.07	3.99	5.03	20.37	1.26	4.05
Mar 2013	434	12,481.20	13096.70	266.07	3.11	3.47	14.32	1.12	4.13
Mar 2014	-231.71	11,486.72	17,534.31	266.07	0.27	0.23	0.91	0.84	3.96
Mar 2015	-213.97	15,340.88	19,524.62	284.59	2.26	2.56	9.08	1.14	3.55



Mar 2016	790.66	22,319.58	22,198.71	284.59	1.91	2.99	8.2	1.57	2.74
Mar 2017	1,647.01	22,870.96	26,668.32	284.59	5.61	9.12	21.24	1.63	2.33
Mar 2018	1,819.98	29,619.57	33,517.99	292.71	6.35	10.95	25.86	1.72	2.36
Mar 2019	2,183.32	33,196.84	39,121.91	293.55	6.74	11.15	25.59	1.66	2.30

	Eicher Motors Ltd.	Mahindra and Mahindra Ltd.	TATA Motors Ltd.	Bajaj Auto Ltd.	Ashok Leyland Ltd.
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**Table 9 : Du Pont Analysis for Ashok Leyland Ltd.**

		PAT Margin	ROA	ROE	Asset Turnover	Equity Multiplier	NET INCOME	NET SALES	TOTAL ASSETS	TOTAL SHARE CAPITAL
NET SALES	R <sub>1</sub>	0.285	0.572	0.178	0.810	-0.869	0.719	1.000	0.851	0.843
	R <sub>2</sub>	0.081	0.327	0.032	0.656	0.756	0.517	1.000	0.725	0.711
ROE	R <sub>1</sub>	0.962	0.884	1.000	0.556	-0.343	0.742	0.178	0.213	-0.237
	R <sub>2</sub>	0.926	0.781	1.000	0.310	0.117	0.550	0.032	0.046	0.056

**Table 10: The calculated Pearson Correlation Coefficient of Du Pont Component for Ashok Leyland Ltd.**

For Ashok Leyland, the turnover which is expressed as Net Sales is highly positively correlated with Asset Turnover , Total assets and total share capital and well positively correlated with Net Income. It implies that the growth of the company is attributed by the increase in sales which is



NET SALES (R <sub>1</sub> )					
Strongly Positive	PAT Margin, Net Income,	PAT Margin	PAT Margin, AT	Net Income, Total Assets	AT, Net Income
	Total Assets, Total Share capital	Total Share Capital	Total Share Capital, Total Assets		Total Share Capital, Total Assets
Strongly Negative	ROA, ROE, AT			ROE, EM	EM
ROE(R <sub>2</sub> )					
Strongly Positive	ROA	ROA, EM, Net Sales	ROA	ROA, EM	PAT Margin, ROA, Net Income
Strongly Negative	PAT Margin, Net Income, Total Assets	PAT Margin, AT	Net Sales, Total Assets	Net Sales, Total Assets	

also reflected on the Net income. ROE is found to be moderately negatively correlated with Equity Multiplier signifying low dependence on debt which is reflected in the total debt to owners fund ratio which has decreased from 0.63 to 0.05 during FY14-15 to FY 18-19(financial Report) which is in favour of the company's profitability. The table also reveals high positive correlation of Net sales with Total Share capital (0.843) with dependency of share capital on Net sales in 71.1% of the instances.

### Conclusion

The paper is an attempt to determine the causal factors affecting the turnover and Profitability of the selected Automobiles companies. It is found that Net sales is significantly strongly positively correlated with Net Income, Total share capital and Total assets of the companies taken into study. To augment the turnover of the companies in the Automobile sector in India, investment in the form of capital adding to the total assets of the companies can be contemplated. The profitability in terms of ROE is showing strong Positive correlation with ROA in all the companies of the automobile industry taken into consideration signifying efficient use of resources by the management. It is observed that only in case of Ashok Leyland Ltd. the Profit Margin and Net Income is positively correlated with ROE which can be attributed towards its pioneer positioning in the commercial vehicle segment with many products becoming industry benchmark. Strong negative correlation of ROE with Net sales and Total assets in case of Tata Motors Ltd and Bajaj Auto Ltd may indicate very low contribution of sales and Assets towards profitability although an increase in sales is seen over the years. The share capital which is seen almost constant in these two companies indicating increasing debt may also be reason behind negative relationship.



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