# AN ANALYSIS OF PROFITABILITY RATIOS OF S&P BSE AUTO INDEX COMPANIES - AN EMPIRICAL STUDY

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**Abstract:**
Profitability is the primary goal of all business ventures. Without profitability the business will not survive in the long run. So measuring current and past profitability is very important. Profitability ratios measure the efficiency of the firm in operating the firm's assets. Many stakeholders like creditors, investor, employees, management and others are interested in profitability position of the firm. If the firm fails to post adequate rate of profits, it will reduce the company's cash and leads to liquidity problems. This paper aims to analyze the profitability of selected Automobile companies in India using profitability ratios. The study also used one Way ANOVA. The study found that Cummins India and Bajaj auto have posted highest values of GPM, OPM and NPM against its peer companies. MRF has shown highest EPS. An upward trend in Return on long term funds was found in Mothersonsumi. It is also found that Tata motors and Ashok Leyland have shown downward trend performance in terms of posting net profit.



**Keywords:** Gross profit, Net profit, operating profit, EPS, and RONW etc.,
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**Introduction**

In the present study, Automobile companies have been selected for evaluation. The automotive industry in India is one of the larger markets in the world and had previously been one of the fastest growing globally, but is now seeing flat or negative growth rates. India's passenger car and commercial vehicle manufacturing industry is the sixth largest in the world, with an annual production of more than 3.9 million units in 2011. According to recent reports, India overtook Brazil and became the sixth largest passenger vehicle producer in the world.

**Statement of the problem**

Financial analysis helps in identifying the financial strengths and weakness of the firm by establishing the relationship between the components of financial statements.

Ratio analysis techniques are widely used to analyze the firm's financial statements. Many diverse groups of people are interested to know the financial information which indicates the firms operating and financial performance. Against this backdrop, an attempt has been made to analyze the profitability position of selected Automobile companies in India.

**Objectives of the study**

1. To analyze the profitability position of the selected Automobile companies, and
2. To study the significant variation in profitability ratios using time series and cross sectional analysis

**Review of Literature**

Dr. S.K. khartik and Titto Varghese, (2011) they found the profitability more or less depends upon the better utilization of resources and to manpower. It is worthwhile to increase production capacity and use advance technology to cut down cost of production and wage cost in order to increase profitability, not only against the investment, but also for investor's return points of view.

Eljelly (2004) elucidate, that efficient liquidity management involves planning and controlling current assets and current liabilities in such a manner that eliminates the risk of inability to meet due short-term obligations and avoids excessive investment in these assets. The study found that the cash conversion cycle was of more importance as a measure of liquidity than the current ratio that affects profitability..

Vijayakumar and Venkatachalan (2003) In their study indicated a moderate trend in the financial position and the utilization of working capital, variations in working capital size should be avoided attempts should also be made to use funds more effectively, by keeping an optimum level of working capital. Because, keeping more current assets cause a reduction in profitability. Hence, efforts should be made to ensure a positive trend in the estimation and maintenance of the working capital.

Marc Deloof (2003) stated that the companies have large amount of cash invested in working capital. It can therefore be expected that the way in which working capital is managed will have a significant impact on the profitability of companies. This a significant negative relation between gross operating income and the number of days accounts receivable, inventories and accounts payable of Belgian firm.

Asha Sharma and R.B. Sharma (2011), These attempts identify and study the movement of key financial parameters and their relationship with profitability of textile industry. It is an attempt to and the study whether the key identified parameters move in a synchronous way going up and coming down with basic profitability parameters. All three comparably profit-making companies have been taken as the sample for the study for the period of 2006 to 2010.

**Hypothesis of the study**

H1 = There is no significant difference between the Gross profit margin of selected Automobile companies.

H2 = There is no significant difference between the Net profit margin of selected Automobile companies.

H3 = There is no significant difference between the operating profit margin of selected Automobile companies.

H4 = There is no significant difference between the EPS of selected Automobile companies.

H5 = There is no significant difference between the Return on total funds of selected Automobile companies.

H6 = There is no significant difference between the Return on net worth of selected Automobile companies.



All the companies that constitute in the BSE Auto index have been considered for the study. The Sample Automobile companies include Ashok Leyland, Bajaj, Bosch, Cummins, Hero Motocorp, MRF, M&M, and Maruti, Motherson, Tat motors and Exide industries.

Period of the study and Sources of data The study covers a period of five financial years from 2008-09 to 2012-13.The data used in the study is secondary in nature. The financial statements of the sample companies are collected from the website of money.rediff.com.

**Techniques of Analysis**

For the analysis of data, various ratios relating to Profitability is considered. Moreover the simple statistical measures like mean and ANOVA Test is also applied for hypothesis testing.

**Results and Discussion**

**Gross Profit**

Gross profit ratio is important for management because it highlights the efficiency of operation and also indicates the average spread between the operating cost and revenue. The Gross Profit Ratio expresses the relationship between gross profit and sales.

Table 1 : Gross Profit Ratios of Selected Automobile Companies

| Companies | March 2013 (%) | 2012(%) | 2011(%) | 2010(%) | 2009(%) |
|---|---|---|---|---|---|
| Ashok leyland | 3.96 | 6.78 | 8.32 | 7.49 | 4.77 |
| Bajaj | 17.35 | 18.39 | 19.03 | 20.03 | 11.08 |
| Bosch | 17.16 | 15.91 | 17.2 | 17.46 | 13.7 |
| Cummins | 18.19 | 16.93 | 18.12 | 18.72 | 15.07 |
| Hero moto | 10.81 | 11.33 | 16.11 | 12.75 | 11.67 |
| MRF | 8.09 | 5.82 | 7.71 | 8.03 | 5.3 |
| M&M | 9.88 | 10.03 | 12.89 | 14.29 | 7.59 |
| Maruti | 4.85 | 6.37 | 9.93 | 5.77 | 10.97 |
| Motherson | 12.71 | 12.52 | 12.9 | 10.52 | 12.15 |
| Tata motors | 4.74 | 6.97 | 8.47 | 3.3 | 8.26 |
| Exide | 11.02 | 11.69 | 15.74 | 19.29 | 12.82 |

Source: Compiled figures using the data

The above table shows the gross profit position of the sample Automobile companies. It is inferred from the table that Cummins India ltd has shown sustainability in maintain good GPM. Bajaj Auto stood in the second place with the next highest GPM over the study period. However Tat motors posted least GPM (3.3%) over the study period and the GPM of Ashok Leyland Ltd was at lowest levels (3.96% in 2012-2013 and 4.77% in 2008-09 respectively)

**Hypothesis Testing**

H0 = There is no significant difference between the Gross profit margin of selected Automobile companies.

Ha = There is a significant difference between the gross profit margin of selected Automobile companies.

Table 2 : Results of One- Way ANOVA - Gross profit (%)

| Source of Variation | SS | df | MS | F | P-value | F crit |
|---|---|---|---|---|---|---|
| Between Groups | 68.99891 | 4 | 17.24973 | 0.779040541 | 0.54412 | 2.55717915 |
| Within Groups | 1107.114 | 50 | 22.14227 | | | |
| Total | 1176.112 | 54 | | | | |

At 95% confidence level, the critical value obtained from F table is 2.55.The calculated value is 0.77. Since the calculated value is less than the table value (0.77> 2.55), the null hypothesis is accepted as against the alternative hypothesis. Thus it can be inferred that the GPM of sample automobile companies does not differ significantly.

**Net Profit Ratio**

The net profit is overall measures of a firm's ability to turn each rupee of sales into profit. It indicates the efficiency with which a business is managed.

Table 3 :Netprofit Ratios of Selected Automobile Companies

| Companies | March 2013 | 2012 | 2011 | 2010 | 2009 |
|---|---|---|---|---|---|
| Ashok Leyland | 3.45 | 4.24 | 5.51 | 5.66 | 3.04 |
| Bajaj | 14.63 | 15.11 | 19.8 | 14.23 | 7.4 |
| Bosch | 10.61 | 13.5 | 12.4 | 11.72 | 13.11 |
| Cummins | 15.93 | 14.08 | 14.34 | 14.96 | 12.63 |
| Hero Moto | 10.04 | 9.89 | 14 | 10.3 | 9.27 |
| MRF | 4.81 | 6.36 | 4.73 | 4.5 | 2.8 |
| M&M | 4.53 | 6.13 | 8.34 | 5.72 | 9.34 |
| Maruti | 4.85 | 6.37 | 9.93 | 5.77 | 10.97 |
| Motherson | 8.67 | 10.01 | 10.07 | 5.21 | 9.66 |
| Tata motors | 2.26 | 3.74 | 6.26 | 3.77 | 6.96 |
| Exide | 8.48 | 8.89 | 12.86 | 12.7 | 7.55 |

Source: Compiled figures using the data

The above table depicts the gross profit position of the sample Automobile companies. It is understood from the table that Cummins India ltd and Bajaj Auto have shown good NPM over the study period. Further Tata motors posted least NPM (2.26%).

**Hypothesis Testing**

H0 = There is no significant difference between the Net profit margin of selected Automobile companies.

Ha = There is a significant difference between the Net profit margin of selected Automobile companies.

Table 4 : Results of One- Way ANOVA - Net profit (%)

| Source of Variation | SS | df | MS | F | P-value | F crit |
|---|---|---|---|---|---|---|
| Between Groups | 49.40895 | 4 | 12.35224 | 0.720524 | 0.581979 | 2.557179 |
| Within Groups | 857.1706 | 50 | 17.14341 | | | |
| Total | 906.5795 | 54 | | | | |

Source: Compiled figures using the data

At 95% confidence level, the critical value obtained from F table is 2.55.The calculated value is 0.72. Since the calculated value is less than the table value (0.72> 2.55), the null hypothesis is accepted as against the alternative hypothesis. Thus it can be inferred that the NPM of sample automobile companies does not differ significantly.

**Operating Profit Ratio**

This ratio measures the efficiency of operations of the company. This ratio is designed to give attention on the net profit margin arising from the business process before tax is deducted. This convention is to express (PBT) Profit before tax (PBT) as a percentage of sales.

Operating Profit Ratio =PBT/Sales *100

Table 5 : Operating Profit Ratios of Selected Automobile Companies

| Companies | 2013-2012 | 2012-2011 | 2011-2010 | 2010-2009 | 2009-2008 |
|---|---|---|---|---|---|
| Ashok Leyland | 7.01 | 9.43 | 10.67 | 10.23 | 7.66 |
| Bajaj | 18.17 | 19.14 | 19.78 | 21.19 | 12.57 |
| Bosch | 15.58 | 17.39 | 16.09 | 13.52 | 16.19 |
| Cummins | 18.19 | 16.93 | 18.12 | 18.72 | 15.07 |
| Hero Moto | 15.46 | 13.4 | 17.32 | 14.22 | 13.22 |
| MRF | 10.64 | 8.37 | 11.2 | 12.42 | 8.65 |
| M&M | 11.64 | 11.84 | 14.65 | 16.29 | 9.81 |
| Maruti | 8.05 | 9.14 | 12.74 | 9.18 | 14.12 |
| Motherson | 15.99 | 15.45 | 16.61 | 14.67 | 15.96 |
| Tata motors | 7.7 | 9.81 | 11.4 | 6.71 | 10.53 |
| Exide | 12.88 | 13.66 | 17.38 | 21.21 | 14.63 |

From the above table, it is inferred that Cummins India, Bajaj Auto, Bosch and Mothersonsumi ltd have posted reasonable OPM in the all the five financial years. However Ashok Leyland followed by Tata motors have registered least OPM over the study period.

**Hypothesis Testing**

H0 = There is no significant difference between the Operating profit margin of selected Automobile companies.

Ha = There is a significant difference between the operating profit margin of selected Automobile companies.

Table6 : Results of One-Way ANOVA - Operating profit (%)

| Source of Variation | SS | df | MS | F | P-value | F crit |
|---|---|---|---|---|---|---|
| Between Groups | 51.24154545 | 4 | 12.81038636 | 0.887741 | 0.478169736 | 2.557179 |
| Within Groups | 721.5163091 | 50 | 14.43032618 | | | |
| Total | 772.7578545 | 54 | | | | |

Source: Compiled figures using the data

The calculated F value is 0.88 as against the critical value 2.55. Since the calculated value being lower than the critical value at 5% level of significance, the Null Hypothesis is accepted as against the alternative hypothesis. Thus it can be concluded that OPM of Sample automobile companies do not vary significantly.

**Return on Net worth Ratio**

This ratio is a very effective measure of the profitability of any firm. This ratio measures the return on the total equity of shareholders Net Worth. This ratio is one of the important tools in financial statement analysis.

RONW = (Reported Net Profit/Net worth)*100

Table 7 : RONW Ratios of Selected Automobile Companies

| Companies | March 2013 | 2012 | 2011 | 2010 | 2009 |
|---|---|---|---|---|---|
| Ashok Leyland | 9.73 | 19.57 | 23.8 | 18.27 | 9.05 |
| Bajaj | 38.51 | 49.72 | 68.01 | 58.14 | 38.92 |
| Bosch | 17.19 | 23.74 | 20.95 | 17.44 | 20.47 |
| Cummins | 32.01 | 28.93 | 32.71 | 28.43 | 31.09 |
| Hero Moto | 55.43 | 65.21 | 64.41 | 33.72 | 32.41 |
| MRF | 20.02 | 26.95 | 20.93 | 18.82 | 12.66 |
| M&M | 22.87 | 23.8 | 25.92 | 26.74 | 16.03 |
| Maruti | 10.76 | 16.5 | 21.1 | 13.04 | 20.56 |
| Motherson | 24.8 | 28.51 | 25.03 | 17.95 | 35.76 |
| Tata motors | 6.42 | 9.06 | 15.15 | 8.09 | 25.98 |
| Exide | 15.26 | 15.21 | 24.54 | 24.53 | 23.35 |

The above table represents the Return on Net worth position of the selected Automobile companies. During the financial year ended March 2013, Hero Moto corp. has posted highest return on Net worth (55.43%) among the sample companies. Tata motors has posted very least RONW (6.42%) over the study period which means that the Tata motors has failed to use owners' capital in a productive way.

**Hypothesis Testing**

H0 = There is no significant difference between the RONW of selected Automobile companies.

Ha = There is a significant difference between the RONW of selected Automobile companies.

Table 8 : Results of One- Way ANOVA - RONW (%)

| Source of Variation | SS | df | MS | F | P-value | F crit |
|---|---|---|---|---|---|---|
| Between Groups | 505.0529 | 4 | 126.2632 | 0.594412 | 0.668297 | 2.557179 |
| Within Groups | 10620.85 | 50 | 212.417 | | | |
| Total | 11125.9 | 54 | | | | |

Source: Compiled figures using the data

The calculated F value is 0.59 as against the critical value 2.55. Since the calculated value being lower than the critical value at 5% level of significance, the Null Hypothesis is accepted as against the alternative hypothesis. Thus it can be concluded that RONW of Sample automobile companies do not vary significantly.

**Return on Total Assets**

It is a measure of profitability from a given level of investment. The greater a company's earnings in proportion to its assets, the more effectively that the company is said to be using its assets.

RONW = (Reported Net Profit/Total Assets)*100

Table 9: Return on long term funds ratios of selected automobile companies

| Companies | March 2013 | 2012 | 2011 | 2010 | 2009 |
|---|---|---|---|---|---|
| Ashok Leyland | 7.75 | 18.11 | 18.6 | 12.89 | 8.78 |
| Bajaj | 53.51 | 64.24 | 69.67 | 59.19 | 35.36 |
| Bosch | 23.48 | 28.08 | 23.78 | 15.3 | 19.18 |
| Cummins | 41.66 | 36.08 | 44.36 | 39.23 | 40.35 |
| Hero Moto | 49.83 | 52.13 | 75.07 | 43.33 | 41.57 |
| MRF | 25.04 | 17.04 | 24.72 | 28.34 | 16.86 |
| M&M | 25.5 | 23.58 | 27.05 | 27.73 | 14.51 |
| Maruti | 14.48 | 21.74 | 28.8 | 17.48 | 27.35 |
| Motherson | 31.52 | 28.11 | 26.02 | 18.33 | 23.85 |
| Tata motors | 11.49 | 12.01 | 12.26 | 8.89 | 22.85 |
| Exide | 21.8 | 21.95 | 33.2 | 36.17 | 33.41 |

Source: Compiled figures using the data

Table 9 provides the results of ROTA. It is understood from the table that the ROTA of Hero Motor corp. was highest over the study period and ROTA of Ashok Leyland has declined from 18.11% in 2011-2012 to 7.75 % in 2012-13 indicating a fall in the overall profitability of the company.

**Hypothesis Testing**

H0 = There is no significant difference between the ROTA of selected Automobile companies.

Ha = There is a significant difference between the ROTA of selected Automobile companies.

Table 10 : Results of One- Way ANOVA - ROTA (%)

| Source of Variation | SS | df | MS | F | P-value | F crit |
|---|---|---|---|---|---|---|
| Between Groups | 518.2093 | 4 | 129.5523 | 0.522478 | 0.71961 | 2.557179 |
| Within Groups | 12397.88 | 50 | 247.9575 | | | |
| Total | 12916.08 | 54 | | | | |

F cal< F critical value (0.52<2.55) The Null hypothesis is accepted and it can be concluded that the ROTA of sample companies do not differ significantly.

**Earnings Per Share (EPS)**

Earnings per share (EPS) tells an investor how much of the company's profit belongs to each share of stock. Earnings per Share are the Net Income (profit) of a company divided by the number of outstanding shares.

Table 11 : EPS of Selected Automobile Companies

| Companies | March 2013 | 2012 | 2011 | 2010 | 2009 |
|---|---|---|---|---|---|
| Ashok Leyland | 1.63 | 2.13 | 4.75 | 3.18 | 1.43 |
| Bajaj | 105.18 | 103.81 | 115.42 | 117.69 | 45.37 |
| Bosch | 305.2 | 357.52 | 273.55 | 188.11 | 197.93 |
| Cummins | 27.57 | 21.33 | 29.85 | 22.42 | 21.9 |
| Hero Moto | 174.05 | 116.7 | 121.35 | 73.24 | 56.5 |
| MRF | 2,059.28 | 1,084.42 | 1,413.93 | 1,177.87 | 723.74 |
| M&M | 56.8 | 48.88 | 45.33 | 36.89 | 30.69 |
| Maruti | 56.6 | 79.21 | 86.45 | 42.18 | 59.91 |
| Motherson | 8.16 | 7.42 | 4.76 | 1.96 | 3.61 |
| Tata motors | 3.91 | 28.55 | 39.26 | 19.48 | 52.6 |
| Exide | 6.15 | 5.43 | 7.84 | 6.32 | 3.55 |

Table 11 presents the EPS of the sample Auto mobile companies.MRF has posted highest EPS over the study period (on Rs.10 Face value share). It indicates the firm's possibility of higher dividend payout or bonus shares. Whereas Ashok Leyland has posted least EPS trend over the study period (on Rs.1 face value share)

**Hypothesis Testing**

H0 = There is no significant difference between the EPS of selected Automobile companies.

Ha = There is a significant difference between the EPS of selected Automobile companies

Table 12: Results of One- Way ANOVA - EPS (%)

| Source of Variation | SS | df | MS | F | P-value | F crit |
|---|---|---|---|---|---|---|
| Between Groups | 128189.5405 | 4 | 32047.39 | 0.199751 | 0.937323 | 2.557179 |
| Within Groups | 8021848.079 | 50 | 160437 | | | |
| Total | 8150037.62 | 54 | | | | |

F cal< F critical value (0.52<2.55) The Null hypothesis is accepted and it can be concluded that the EPS of sample companies do not differ significantly.

**Findings of the study**

- The GPM of Cummins Ltd. is relatively higher than that of its peer companies in the industry and Ashok Leyland and Tata motors have posted very less GPMs over the study period.
- Bajaj Auto and Cummins ltd have shown favorable performance in terms of Net profit which means that these companies are good at operating their assets in an optimum way. However MRF, M&M, Ashok Leyland and Tata motors are not that efficient in posting better numbers at the bottom line.
- MRF, Bajaj Auto and Hero Moto corp. have sustained the good trend of generating EPS over the study period because of their good operating and managerial efficiency.
- As far as assets utilization is concerned, Hero Moto corp. has shown impressive performance and Ashok Leyland has shown inferior performance.
- There is no statistically significant difference between selected profitability ratios of sample Automobile companies.

**Conclusion**

From the study, it is Concluded that the majority of two wheeler companies (Bajaj Auto, Hero Moto corp.) have shown better profitability performance than the four Tata Motors, Ashok Leyland and Maruti Suzuki) wheeler companies.

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