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EVALUATING PROFITABILITY PERFORMANCE OF BAJAJ AUTO LTD & HERO MOTOCORP BY USING DUPONT MODEL

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ABSTRACT

This study attempts to measure the financial performance of the Auto-mobile companies in India with respect to Bajaj Auto Ltd and Hero Motocorp. In this paper, researcher uses DuPont analysis, is method of assessing a company's return on equity (ROE) breaking into three parts i.e. Profit Margin (Profit/Sales), Total Assets Turnover (Sales/Assets) and Equity Multiplier (Assets/Equity). In order to achieve the goal, this study has measured the ratios of ROE, ROA applying the DuPont analysis, which have been demonstrated with tables and graphs to show the change periodically. DuPont analysis is based on analysis of Return on Equity (ROE) & Return on Investment (ROI). DuPont analysis (ROI and ROE) is an important tool for judging the operating financial performance. It is an indication of the earning power of the firm. The return on equity dis-aggregate performance into three components: Net Profit Margin, Total Asset Turnover, and the Equity Multiplier. The return on investment consists of Assets Turnover (Operating Income×Total Assets) and Profit Margin (EBIT×Operating Income). The researcher used't' test for analyzing and comparing previous 5 years financial data to find out level of significant change.

Keywords: *DuPont Analysis, Return on Equity, Return on Investment, Financial Performance*

INTRODUCTION

For any business in the private sector, there are numerous of models to describe how well the business is running. Among these the DuPont model was created in the early 1900s which is still a model valid to be used for assessment of the profitability. Using the DuPont model for risk analysis is not very common but if a risk analysis specialist wants to talk the language of business, it can be valuable.

The model was created by F. Donaldson Brown who came up with the model when he was assigned to clean up the finances in General Motors and has ever since been an important model for financial analysis. Remarkably it has not been used in the security community for risk prioritization or impact analysis. The original DuPont method of financial ratio analysis was developed in 1918 by an engineer at DuPont who was charged with understanding the finances of a company that DuPont was acquiring. He noticed that the product of two often-computed ratios, net profit margin and total asset turnover, equals return on assets (ROA). The elegance of ROA being affected by a profitability measure and an efficiency measure led to the DuPont method becoming a widely-used tool of financial analysis. In the 1970's, emphasis in financial analysis shifted from ROA to return on equity (ROE), and the DuPont model was modified to include the ratio of total assets to equity.

Before discussing the mechanics and usefulness of Du Pont, it may be of some interest to learn about its development. The maturity of the Du Pont model parallels the progress made in the field of financial analysis itself. Three distinct versions of Du Pont have been created and used to help unravel the underlying drivers of profitability and return over time, beginning nearly 90 years ago.

In 1918, four years after he was hired by the E. I. DuPont Corporation of Wilmington, Delaware, to work in its treasury department, electrical engineer F. Donaldson Brown was given the task of untangling the finances of a company of which Du Pont had just purchased 23% of its stock. (This company was General Motors) Brown recognized a mathematical relationship that existed between the two commonly computed ratios, namely net profit margin (obviously a profitability measure) and total asset turnover (an efficiency measure), and ROA. The product of the net

profit margin and the total asset turnover equals ROA, and this was the original Du Pont model, ROA (net income / sales) x (sales / total assets) = (net income / total assets).

SIGNIFICANCE OF THE STUDY

Investor's uses return on equity (ROE) to measure the earnings of a company generates from its assets. With it, they can determine whether a firm is profit-creator or a profit-burner and management's profit-generating efficiency. Why is this important to investors? Companies that are good at coaxing profits from their operations tend to have competitive advantages, which can translate into superior investment returns. The DuPont model is a useful tool in providing both an overview and a focus for such analysis. It can be used as a compass in the process by directing the analyst towards significant areas of strength and weakness evident in the financial statements. Hence, this research has taken for comparing previous 5 years profitability performance of the top two Automobile companies in India with respect to Bajaj Auto Ltd and Hero Motocorp by using DuPont.

LITERATURE REVIEW

Dr. Pravin Mahamuni & Dr. Anand Jumle (2016): This research paper is all about to measure and compare the profitability performance of the Automobile companies in India with respect to Tata Motors Ltd. and Mahindra & Mahindra Ltd. by using DuPont. In this paper, researcher uses DuPont analysis, is a method for assessing a company's return on equity (ROE) breaking it into three parts i.e. Profit Margin (Profit/Sales), Total Asset Turnover (Sales/Assets) and Equity Multiplier (Assets/Equity). it is concluded that the DuPont analysis made by calculating ROE and ROI for top two Indian automobile companies (the Tata Motors Ltd and Mahindra & Mahindra Ltd.) and result portrays that Mahindra & Mahindra Ltd. have better profitability performance rather than its compititors Tata Motors Ltd..

Brigham & Houston (2001): The modified model was a powerful tool to illustrate the interconnectedness of a firm's income statement and its balance sheet and to develop straightforward strategies for improving the firm's ROE. The Du Pont identity provides an excellent way to get a quick snapshot view of the overall performance of a firm in three critical areas of ratio analysis.

Milbourn & Haight (2005): ***Providing Students with an Overview of Financial Statements Using the Du Pont Analysis Approach*****-** Du Pont Analysis as a teaching aid to equip students with an understanding of how management decisions influence the bottom line. Unfortunately, the Milbourn & Haight paper were concerned exclusively only with the original Du Pont model, i.e. it showed the drivers of no more than Return on Assets. They have shown the impact and value of the Du Pont model drivers on Return on Equity.

De Wet & Du Toit(2007*):Return on Equity: A Popular, but Flawed Measure of Corporate Financial Performance*-showed how ROE is calculated by taking the profit after tax and preference dividends of a given year and dividing it by the book value of equity (ordinary shares) at the beginning of the year. Average equity can also be used. Equity would consist of the issued ordinary share capital plus the share premium and reserves.

Nissim & Penman (2001): ***Ratio Analysis and Valuation: From Research to Practice*****-** suggested using a modified version of the traditional DuPont model in order to eliminate the effects of financial leverage and other factors not under the control of those managers. Using operating income to sales and asset turnover based on operating assets limits the performance measure of the management to those factors over which management has more control.

Mihaela Herciu et al (2011): ***A DuPont Analysis of the 20 Most Profitable Companies in the World*****-** attempted to demonstrate that in most cases the most profitable companies are not the most attractive for investors – through Du Pont Analysis method. In order to do this, they took into account the top 20 most profitable companies in the world in 2009 (according to Fortune). By using Du Pont analysis, they arrived at the results that ranking is not preserved when indicators (ratios) such as ROA (return on assets) or ROI (return on Investment), ROE (return on equity) or ROS (return on sales) are taken into consideration.

Ahmed Arif Almazari (2012): ***Financial Performance Analysis of the Jordanian Arab Bank by using the Du Pont System of Financial Analysis*****-** attempted basically to measure the financial performance of the Jordanian Arab Commercial Bank for the period 2000-2009 by using the Du Pont system of financial analysis which is based on the analysis of return on equity

model and return on investment model. From this study it was found that, the financial performance of Arab Bank is relatively steady and reflects minimal volatility in the return on equity. Net profit margin and total asset turnover exhibit relative stability for the period from 2001 to 2009. The equity multiplier also showed almost stable indicators for the period from 2001-2005 and the ratios declined from 2006-2009 which indicated that the Arab bank had less financial leverage in the recent years, which means that the bank is relying less on debt to finance its assets.

McClure (2008:*ROI and ROE Give Clear Picture of Corporate Health*- Using Du Pont Analysis, presented that a common form of financial statement analysis, decomposes return on net operating assets into two multiplicative components: profit margin and asset turnover. These two accounting ratios measure different constructs and, accordingly, have different properties. Prior research has found that a change in asset turnover is positively related to future changes in earnings.

Prendergast (2006):*Financial Analysis: How a Modified DuPont Approach to Ratio Analysis can be Used to Drill Down to the True Cause of Financial Performance Problems*- Presented examples of using Du Pont analysis in both a business and classroom setting. The author illustrates how a 'modified Du Pont approach to ratio analysis can be used to drill down to the true cause of financial performance problems' in a small manufacturing business.

Pratt & Hirst (2008), Palepu & Healy (2008), and Soliman (2008) and in addition, Soliman (2004): The modified Du Pont model has become widely recognized in the financial analysis literature. Because,it was found that, industry-specific DuPont multiplicative components provided more useful valuation than do economy-wide components, suggesting that industry-specific ratios have increased validity.

OBJECTIVES OF THE RESEARCH

- To analyze profitability performance of Bajaj Auto Ltd. & Hero Motocorp by using DuPont method.
- To examine the ROI and ROE of Bajaj Auto Ltd. & Hero Motocorp for last 5 years.

- To compare the ROE & ROI of Bajaj Auto Ltd. & Hero Motocorp for last 5 years.

METHODOLOGY

This study is purely based on secondary data which was collected from Annual Reports of selected firms from their respective websites. The Top 02 Indian two-wheeler companies have been selected for the study on the basis of following criteria.

Company Name	Market Capitalization	Market Shares	Sales
Bajaj Auto Ltd.	90,000 crore	18%	3,34,348 Units
Hero Motocorp	72,707.95 crore	39%	6,29,597 Units

Researcher has undertaken 05 years financial data of selected Companies i.e. 2013-2017 for the study. The researcher used statistical test i.e. 't'- test and financial ratios for data analysis. The following formula was used to discover if there is significant difference between how the performance of the company is assessed. Perhaps, being one of the most important indicators of performance, DuPont formula measures operating efficiency, asset use efficiency and financial leverage.

ROE= Profit Margin (Profit/Sales) * Total Assets Turnover (Sales/Assets) * Equity Multiplier (Assets/Equity)

ROI= Asset Turnover * Profit Margin (EBIT/Operating Income)

DATA ANALYSIS AND INTERPRETATION

Bajaj Auto Ltd.

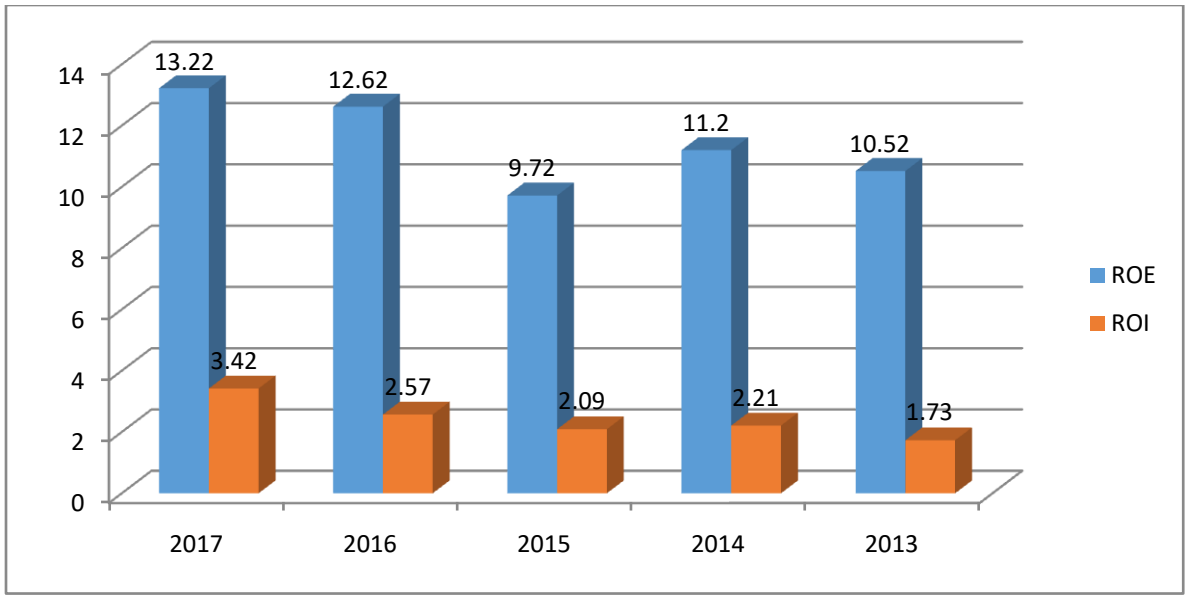

Figure 01: Bajaj Auto Ltd.- ROE & ROI

Table No. 01: Return on Equity

Year	PAT (A) Rs. in Crores	NS (B) Rs. in Crores	PM (A/B)= C %	TA (D) Rs. in Crores	TAT (B/D) = E	EQ (F) Rs. in Crores	EM (D/F)= G	ROE (C*E*G) %
2017	3827.56	21766.68	17.58	17034.13	1.28	289.37	58.87	13.23
2016	3652.41	22687.59	16.10	12401.9	1.83	289.37	42.86	12.62
2015	2813.74	21612.01	13.02	10803.92	2.00	289.37	37.34	9.72
2014	3243.32	20149.51	16.10	9665.76	2.08	289.37	33.40	11.21
2013	3043.57	19997.25	15.22	7973.22	2.51	289.37	27.55	10.52
Mean	3,316.12	21,242.61	15.60	11,575.79	1.94	289.37	40.00	11.46
t-value	17.64	41.48	20.83	7.50	9.73	-----*	7.49	17.63
p-value	0.000	0.000	0.000	0.002	0.001	-----*	0.002	0.000

** t-value cannot be calculated because of the constant value throughout the years.*

From the above table it is inferred that, the profit margin averaged 15.60%, minimum value of the profit margin was 13.02 in the year 2015 and maximum was 17.58 in the year 2017. The net

profit margin ratio was showing that increasing trend since 2013 and profit after tax has also increased year by year. But, in the year 2015 profit margin was (13.2%) declined due to increasing operating expenses and hence it resulted into lower operating profit. t-test (t-value 20.83 & p<0.05) shows there is significant increased profit margin ratio instead of decreased in the 2015.

Total Assets Turnover averaged 1.94 times, maximum was 2.51 in the year 2013 and minimum 1.28 in 2017. The table shows that the Total Asset Turnover ratio decreasing year by year. It means management of the organization is not using its assets effectively to produce the sales.
Equity Multiplier is a ratio used to analyze a company's debt and equity financing strategy. The Equity Multiplier ratio averaged 40.00, minimum was 27.55 in the year 2013 and maximum ratio was 58.87 in the year 2017. There is significant increase shown since 2013 (t value 7.49 & p < 0.05). It indicates that, more assets were funded by the debt rather than equity. Therefore, ROE has increased because financial leverage also has increased in 2017 as compare to 2013.

Table No. 02- Return on Investment

	AT	**EBIT**	**OI**	**PM**	**ROI**
Year	*(A)*	*(B)*	*(C)*	*(B/C)= D*	*(A*D) %*
		Rs. in Crores	*Rs. in Crores*		
2017	2.83	5337.03	4422.35	1.21	3.42
2016	2.28	5385.66	4779.55	1.13	2.57
2015	2.11	4091.28	4116.55	0.99	2.10
2014	1.96	4632.54	4105.74	1.13	2.21
2013	1.48	4266.77	3635.25	1.17	1.74
mean	2.13	4742.66	4211.89	1.13	2.41
t value	9.71	17.74	22.21	30.35	8.43
p value	0.001	0.000	0.000	0.000	0.001

From the above Table, it is observed that, the ROI of the Bajaj Auto Ltd averaged 2.41%, maximum was 3.42 in 2017 and minimum was 1.74 in the year 2013. It is cleared. It is cleared that ROI has significantly increasing (t value 8.43 % & p <0.05) every year since 2013. It means, the investments are gaining comparably favorable to its cost.

Hero Motocorp

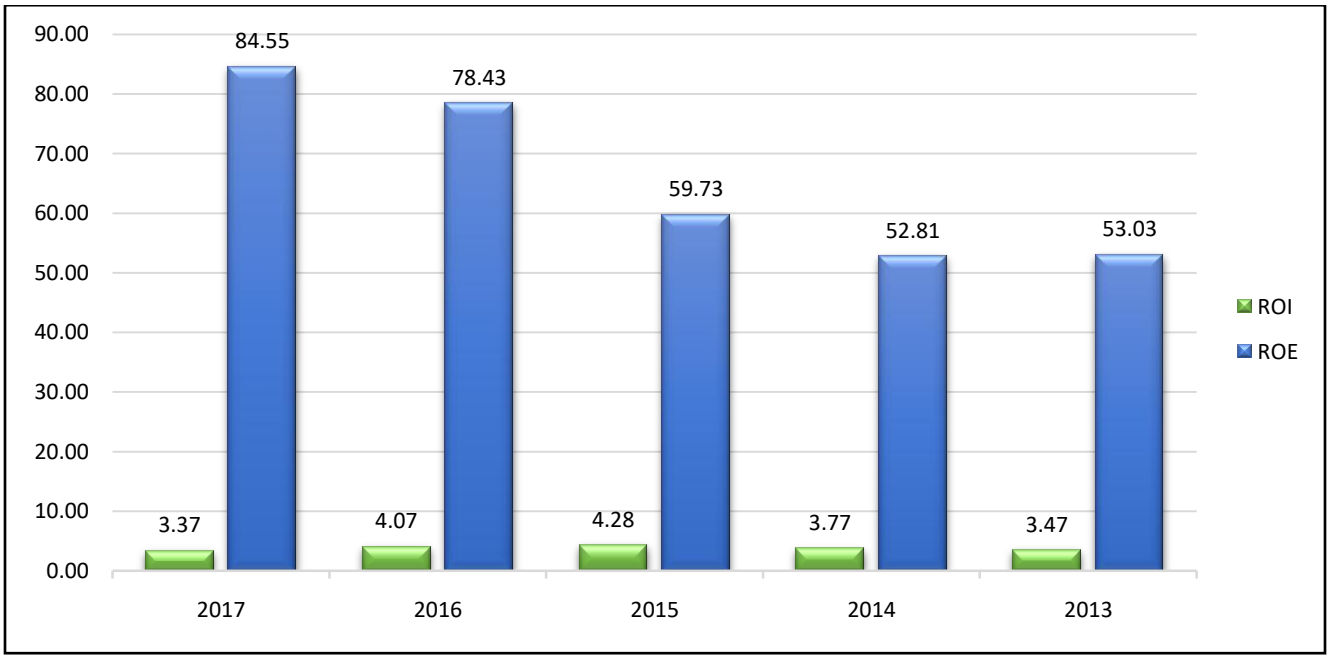

Figure No. 02: Hero Motocorp- ROE & ROI

Table No. 03 – Return On Equity

Year	PAT (A) Rs. in Crores	NS (B) Rs. in Crores	PM (A/B)= C %	TA (D) Rs. in Crores	TAT (B/D)= E	EQ (F) Rs. in Crores	EM (D/F)= G	ROE (C*E*G) %
2017	3,377.12	28,474.99	11.86	9,646.24	2.95	39.94	241.52	84.55
2016	3,132.37	28,599.30	10.95	7,339.35	3.90	39.94	183.76	78.43
2015	2,385.64	27,585.30	8.65	6,541.33	4.22	39.94	163.78	59.73
2014	2,109.08	25,275.47	8.34	5,599.87	4.51	39.94	140.21	52.81
2013	2,118.16	23,768.11	8.91	5,308.40	4.48	39.94	132.91	53.03
Mean	2,624.47	26,740.63	9.74	6,887.04	4.01	39.94	172.44	65.71
t value	9.91	28.06	13.92	8.86	13.97	****	8.86	9.91
p value	0.001	0.000	0.000	0.001	0.000	****	0.001	0.001

** t-value cannot be calculated because of the constant value throughout the years.*

Above Table indicates that, the profit margin averaged 9.74%, the minimum was 8.34 in 2014 and maximum was 11.86 in the year 2017. Profit margine ratio has increased throughout the years t-test (t value 13.92 & p <0.05) shows there is significant increased in profit margin.

Total Assets Turnover averaged 4.01 times, minimum is 2.95 in 2017 and maximum is 4.51 in 2014. It suggest that the efficiency of total assets is decreasing from 2015 (t value 13.97 & p< 0.05) it means management of the company not using its assets to drive the sales.

Financial Leverage of the company significantly increased (t value 8.86& p <0.05), It indicates that, more assets were funded by the equity rather than debt. It means that company uses more than 100% debt to finance its assets.

Table No. 04 – Return on Investment

Year	**AT** *(A)*	**EBIT** *(B)* *Rs. in Crores*	**OI** *(C)* *Rs. in Crores*	**PM** *(B/C)= D*	**ROI** *(A*D) %*
2017	3.35	4,664.51	4,634.81	1.01	3.37
2016	4.12	4,396.73	4,447.01	0.99	4.07
2015	4.54	3,339.91	3,542.18	0.94	4.28
2014	4.63	2,879.07	3,540.06	0.81	3.77
2013	4.48	2,541.11	3,284.48	0.77	3.47
mean	4.22	3,564.27	3,889.71	0.90	3.79
t value	17.97	8.56	14.32	18.70	21.94
p value	0.000	0.001	0.000	0.000	0.000

From the above table it is observed that, the ROI of Hero Motocorp averaged 3.79, the highest in the year 2015 i.e. 4.28 & lowest in 2017 i.e. 3.37. It is clared that ROI has significantly increased (t value 21.94 & p <0.05) every year since 2013. It is because of the profit margin and operating income has also significantly increased.

Comparision of Bajaj Auto Ltd and Hero Motocorp

ROE:

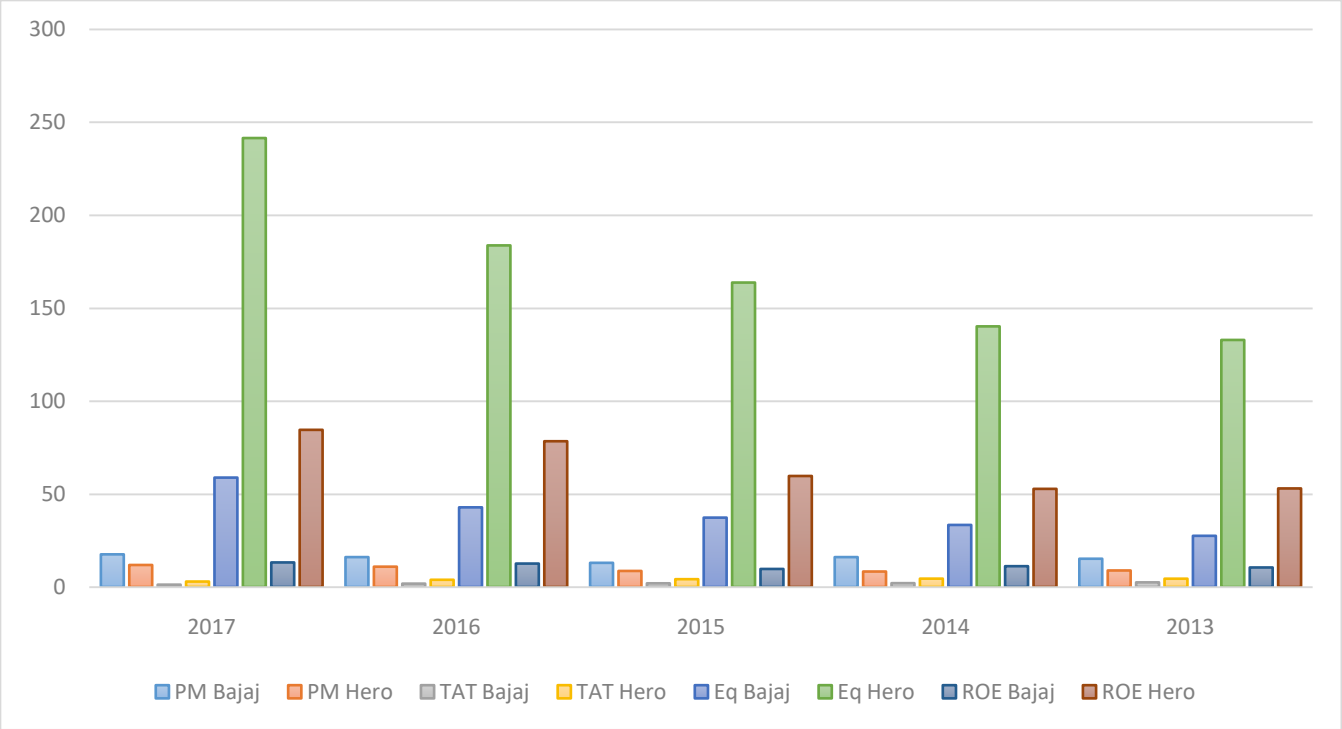

Figure No. 03: ROE

From the above figure No.03 it has been observed that, the ROE of the Hero Motocorp is much higher than the Bajaj Auto Ltd. But, Bajaj Auto is more financially leveraged than Hero Motocorp. Its better to have low multiplier ratio and Bajaj Auto having low equity multiplier and lower multiplier ratios are always considered more conservative and more fevorable than higher ratios because companies with lower ratios are less dependent on debt financing and don't have high debt servicing cost.

ROI:

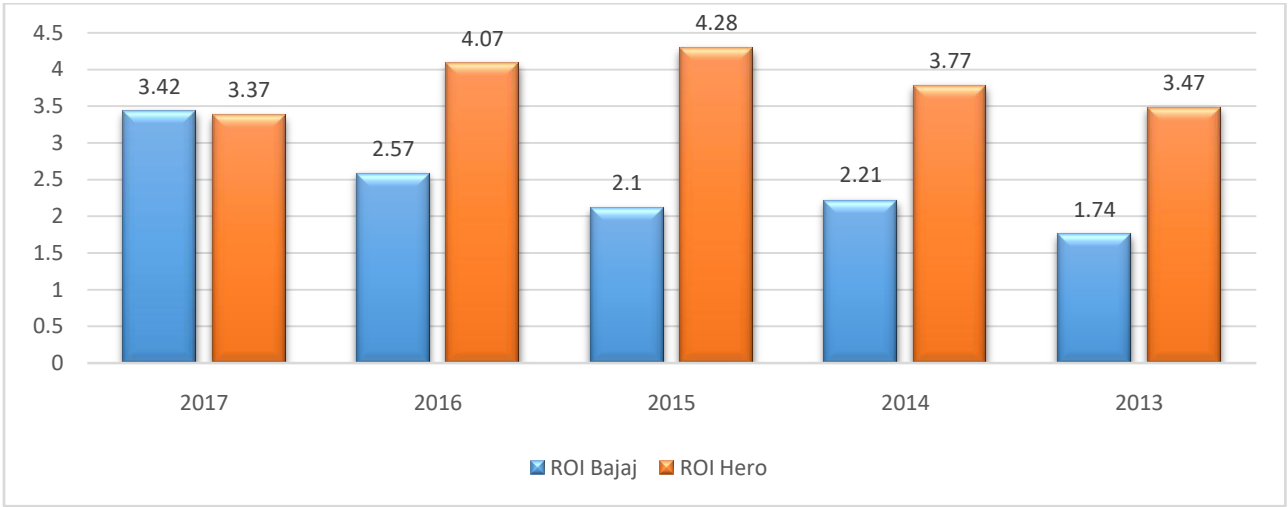

Figure No. 04- ROI

From the above figure no. 04 it has been observed that, ROI of Hero Motocorp is much higher than Bajaj auto ltd. but in the year 2017 the ROI of Hero Motocorp has declined due to low assets turnover.

FINDINGS

Bajaj Auto Ltd.

- Operating expenses of Bajaj Auto Ltd. were increased in 2015 and hence it resulted into lower operating profit in the same year.
- Total Turnover ratio of the Bajaj Auto Ltd. decreasing year by year. It indicates that, the management of Bajaj Auto Ltd. are not using its assets to produce the sales.
- More assets of the Bajaj Auto Ltd. were funded by the debt rather than equity. Therefore, ROE has increased because financial leverage also has increased in 2017 as compare to 2013.
- The investments of the Bajaj Auto Ltd. are gaining comparably favorable to its cost.

Hero Motocorp

- Profit margin of the Hero Motocorp has been significantly increased because Profit after Tax has also been increased throughout the years.
- The efficiency of total assets of Hero Motocorp is decreasing from 2015. it means management of the company not using its assets to drive the sales.
- Financial Leverage of Hero Motocorp significantly It means that company uses more than 100% debt to finance its assets.
- The ROI of Hero Motocorp has significantly increased every year since 2013. Because, the profit margin and operating income has also significantly increased.

Comparision

- The ROE of the Hero Motocorp is much higher than the Bajaj Auto Ltd. But, Bajaj Auto is more financially leveraged than Hero Motocorp.
- ROI of Hero Motocorp is much higher than Bajaj auto ltd. but in the year 2017 the ROI of Hero Motocorp has declined because, decreased in Assets Turnover.

CONCLUSION

In this research, researcher has attempted to measure ROE & ROI to find out the profitability and made comparison against its competitors by using DuPont model of the Bajaj Auto Ltd. and Hero Motocorp. At the end, it is concluded the Du Pont analysis made by calculating ROE & ROI for top two Indian Auto-mobile Companies (Bajaj Auto Ltd. And Hero Motocorp) and result portrays that Bajaj Auto Ltd. have better profitability performance rather than its competitor Hero Motocorp.

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