FACTORS DETERMINING PROFITABILITY IN INDIAN AUTOMOBILE INDUSTRY

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ABSTRACT

Automobile sector has emerged as a sunrise sector. In April-March 2015, overall automobile exports grew by 14.89 percent over the same period last year. Passenger Vehicles, Commercial Vehicles, Three Wheelers and Two Wheelers grew by 4.42 percent, 11.33 percent, 15.44 percent and 17.93 percent respectively during April-March 2015 over the same period last year(SIAM). The leading local firms have established over 200 technical cooperation agreements with foreign firms to be able to reach international standards in cost and manufacturing. The healthy development and rapid growth of this industry has always been very important for the Indian economy. This paper aims to measure the profitability and also to analyze the effects of various factors on the profitability in Indian Automobile industry. For this purpose 16 companies were taken and 21 variables were analyzed through multiple correlation analysis and step wise multiple regression. It is proved that profitability of the Indian Automobile Industry is highly dependent on Operating Ratio and it contributes 93.40 per cent to variation in Return on Sales.

Keywords*: Financial Performance, Ratio Analysis, Profitability, Multiple Correlation Analysis, Regression Analysis and Automobile Industry.*

Introduction:

In India, since 1992-93 the manufacturing sector has grown at the rate of 6.9 per cent per annum, though there has been a considerable fluctuation in its growth rate. The increase in the exports of automobile sector is also due to the adaptation of international standards. After a temporary slump during 1998- 99 and 1999-2000, such exports registered robust growth rates in last few years. Investment is also a major factor for this growth of Indian automotive industry, with investment exceeding US$ 11.11 billion, the turnover of the automobile industry exceeded US$ 13.22 billion in 2002-03. The industry produced a total of 23,366,246 vehicles including passenger vehicles, commercial vehicles, three wheelers and two wheelers in April-March 2015 as against 21,500,165 in April-March 2014, registering a growth of 8.68 percent over the same period last year. The sales of Passenger Vehicles grew by 3.90 percent in April-March 2015 over the same period last year. Within the Passenger Vehicles segment, Passenger Cars and Utility Vehicles grew by 4.99 percent and 5.30 percent respectively, while Vans declined by (-) 10.19 percent in April-March 2015 over the same period last year. The overall Commercial Vehicles segment registered a de-growth of (-) 2.83 percent in April-March 2015 as compared to same period last year. Medium & Heavy Commercial Vehicles (M&HCVs) grew by 16.02

percent and Light Commercial Vehicles declined by (-) 11.57 percent. Three Wheelers sales grew by 10.80 percent in April-March 2015 over the same period last year. Passenger Carriers and Goods Carriers grew by 12.16 percent and 5.27 percent respectively in April-March 2015 over April-March 2014. Two Wheelers sales registered growth of 8.09 percent in April-March 2015 over April-March 2014. Within the Two Wheelers segment, Scooters, Motorcycles and Mopeds grew by 25.06 percent, 2.50 percent and 4.51 percent respectively in April-March 2015 over April-March 2014. In April-March 2015, overall automobile exports grew by 14.89 percent over the same period last year. Passenger Vehicles, Commercial Vehicles, Three Wheelers and Two Wheelers grew by 4.42 percent, 11.33 percent, 15.44 percent and 17.93 percent respectively during April-March 2015 over the same period last year(SIAM). Today, this sector has emerged as a sunrise sector. However, the overcapacity problem is haunting many of the players as demand may not go up significantly. Hence, many players are looking for an external market for Indian automobiles. The prospect of component industry is quite positive. The leading local firms have established over 200 technical cooperation agreements with foreign firms to be able to reach international standards in cost and manufacturing

Selection of Automobile Industry:

Indian Automobile Industry accounts 7 per cent of total FDI in India. The Automobile industry has a unique place in the economy of India. It contributes to the industrial production, employment and earning sources of livelihood of thousands of people. Its exports contribute to a substantial part of India's earning from foreign countries. The healthy development and rapid growth of this industry has always been very important for the Indian economy. Hence the study of the financial performance of the Automobile industry has been selected.

Statement of the Problem:

The Indian Automobile Industry is growing at an average rate of 17 per cent for the past few years. The industry accounts for 7.1 per cent of the country's Gross Domestic Product (GDP). As of FY 2014-15, around 31 per cent of small cars sold globally are manufactured in India.

The Two Wheelers segment with 81 per cent market share is the leader of the Indian Automobile market owing to a growing middle class and a young population. Moreover, the growing interest of the companies in exploring the rural markets further aided the growth of the sector. The overall Passenger Vehicle (PV) segment has 13 per cent market share (DIPP). Against this background, it is very important to analyze the financial performance of the Automobile sector. It is imperative to study the financial performance of this sector so as to guide the future policy makers to decide whether to continue, increase, or reduce or to drop the importance and assistance given to this sector.

Objectives of the Study:

Basically, to analyze the financial performance of the Indian Automobile Industry and to measure the profitability and also to analyze the effects of various factors on the profitability of Indian Automobile Industry.

Research Methodology:

The financial data and information required for the study were drawn from the secondary source. The Prowess corporate databases developed by CMIE (Centre for Monitoring Indian Economy) and CLP (Capital Line Plus) have been used as principal sources. The other relevant data were collected from Journals, Magazines, Websites and Dailies.

The period for this study covered fifteen years from 2000 to 2014 and the essential data for this period have been collected.

In the initial stage the researcher has decided to include all the 48 companies under automobile industry working before or from the year 1998 to 2012. But, owing to several constraints such as non-availability of financial statements or non-working of a company in particular year etc., it is compelled to restrict the number of sample companies to 16.

The study is based on purposive sampling method, making a study of sixteen companies in Indian automobile industry. It accounts for 33.33 per cent of the total companies available in the Indian automobile industry. List of companies included in the present study is presented in

Table 1: List Of Sample Companies

S. No	Companies	Sectors	Code
1	Ashok Leyland	LCVs / HCVs	C1
2	Atul Auto	Scooters & 3 - Wheelers	C2
3	Eicher Motors Ltd	LCVs / HCVs	C3
4	Force Motors Ltd	LCVs / HCVs	C4
5	Hero MotoCorp Ltd	Motorcycles/ opeds	C5
6	Hindusthan Motors	Passenger Cars	C6
7	HMT Ltd	LCVs / HCVs	C7
8	Hyundai Motors	Passenger Cars	C8
9	Kinetic Engineering Ltd	Motorcycles/Mopeds	C9
10	Maharashtra Scooters Ltd	Scooters & 3 - Wheelers	C10
11	Mahindra & Mahindra Ltd	LCVs / HCVs	C11
12	Majestic Auto Ltd	Motorcycles/Mopeds	C12
13	Maruthi Suzuki	Passenger Cars	C13
14	Scooters India Ltd	Scooters & 3-Wheelers	C14
15	SML ISUZU Ltd	LCVs / HCVs	C15
16	Tata Motors Ltd	LCVs / HCVs	C16

Ratios can be very helpful when comparing the financial health of different businesses. The financial performance of Automobile industries can be measured by a number of indicators. The Predictive Variables were identified from the previous studies, particularly from A. Dharmaraj, Dr. N. Kathirvel (2013), Adolphus J.Toby (2008), Agarwal, R. N. (1991). Aggarwal, N. and Singla, S.K. (2001), Ahmed Arif Almazari (2012) Burange L.G and Shruti Yamini (2008) Chandra H and Selvaraj A (2013), Debaprosanna Nandy (2011), Dharmendra S. Mistry (2011) Giulio Bottazzi, Angelo Secchi and Federico Tamagni (2008), Hamasalakshmi R (2009), Jagan Mohan Rao, P (1993). Janaki Ramudu P and Parasuraman N.R (2012) Juliet D' Souza and William L. Megginson, (1999). Kamalnath.P (2010), Krishnaveni. M (2008), Lind, L., Pirttilä, M., Viskari, S., Schupp, F., & Kärri, T. Muthumoni. A (2008) Neha Mittal (2012) Rajalakshmi K and Ramachandran T (2011) Rakesh Kumar Manjhi and S.R. Kulkarni(2012), Saranga, H. (2009). Sarumathi I (2010) Sharma Manisha and Prashaant Anu (2009), Shishir Pandey (2012), Shurveer S. Bhanawat (2011) Swati Dhaval Modi (2012), Tushkar K. Mahanti (2013) Velu Suresh Kumar (2011) and Vijayakumar, D. A. (2011).

In this study, the predictive variables are the financial ratios of Indian Automobile Industry, which are defined in the following table.

Table 2: The List of selected Financial Variables

S. No	Code	Ratios	S. N	Code	Ratios
1	X_1	Current Ratio	12	X_{11}	Net Income to Total Debts Ratio
2	X_2	Quick Ratio	13	X_{12}	Inventory Turnover Ratio
3	X_3	Inventory to Total Assets Ratio	14	X_{13}	Debtors Turnover Ratio
4	X_4	Quick Assets to Total Assets Ratio	15	X_{14}	Fixed Assets Turnover Ratio
5	X_5	Current Assets to Total Assets Ratio	16	X_{15}	Working Capital Turnover Ratio
6	X_6	Working capital to Total Assets Ratio	17	X_{16}	Total Debt to Total Assets Ratio
7	Y	Return on Sales	18	X_{17}	Net Fixed Assets to Equity Ratio
8	X_7	Return on Equity	19	X_{18}	Debt – Equity Ratio
9	X_8	Return on Total Assets	20	X_{19}	Total Assets to Equity Ratio
10	X_9	Return on Capital Employed	21	X_{20}	Long Term Debt-Equity Ratio
11	X_{10}	Operating Ratio			

Statistical Analysis:

In order to identify the prominent factors responsible for the profitability of Automobile industries, and also to measure the extent of relationship of the independent variables on the dependent variable, the Multiple Correlation Analysis was applied by the researcher.

Data Analysis and Interpretation:

Multiple Correlation Analysis attempts to study the relationship that exists between two variables. In this study correlation co-efficient of the selected independent variables with the Automobile profitability has been worked out in order to identify the most important variable, which has a higher association with the dependent variable. The test of significance has also been applied in order to identify the variables, which have significant correlation.

Table 3: Profitability of Indian Automobile Industry

Financial Variables		R	R Square
X_1	Current Ratio	-.166**	0.027556
X_2	Quick Ratio	-0.116	0.013456
X_3	Inventory to Total Assets	-.142*	0.020164
X_4	Quick Assets to Total Assets	-.158*	0.024964
X_5	Current Assets to Total Assets	-.163*	0.026569
X_6	Working capital to Total Assets	-.143*	0.020449
X_7	Return on Equity	.128*	0.016384
X_8	Return on Total Assets	.909**	0.826281
X_9	Return on Capital Employed	0.099	0.009801
X_{10}	Operating Ratio	.966**	0.933156
X_{11}	Net Income to Total Debts	0.058	0.003364
X_{12}	Inventory Turnover Ratio	0.051	0.002601
X_{13}	Debtors Turnover Ratio	0.027	0.000729
X_{14}	Fixed Assets Turnover Ratio	-0.029	0.000841
X_{15}	Working Capital Turnover Ratio	0.025	0.000625
X_{16}	Total Debt to Total Assets	-.280**	0.0784
X_{17}	Net Fixed Assets to Equity	-0.001	0.000001
X_{18}	Debt – Equity Ratio	-.153*	0.023409
X_{19}	Total Assets to Equity	-0.064	0.004096
X_{20}	Long Term Debt-Equity Ratio	-.159*	0.025281

**Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

The impact of selected financial variables on profitability is measured by computing Karl Pearson's correlation coefficients between Return on sales and selected measures relating to the of Indian automobile industry during pre and post foreign direct investment (Table: 3). It is found that:

Current Ratio and Return on Sales are negatively co-related, As Current Ratio decreases Return on Sales increases. The co-efficient of determination r^2 shows that Current Ratio accounts for 2.75 per cent of variation in the Return on Sales. Inventory to Total Assets Ratio and Return on Sales are negatively co-related, As Inventory to Total Assets Ratio decreases Return on Sales increases. The co-efficient of determination r^2 shows that Inventory to Total Assets Ratio accounts for 2.01 per cent of variation in the Return on Sales.

Quick Assets to Total Assets Ratio and Return on Sales are negatively correlated, As Quick Assets to Total Assets Ratio decreases Return on Sales increases. The co-efficient of determination r^2 shows that Quick Assets to Total Assets Ratio accounts for 2.49 per cent of variation in the Return on Sales.

Current Assets to Total Assets Ratio and Return on Sales are negatively correlated, As Current Assets to Total Assets Ratio decreases Return on Sales increases. The co-efficient of determination r^2 shows that Current Assets to Total Assets Ratio accounts for 2.65 per cent of variation in the Return on Sales. Working Capital to Total Assets Ratio and Return on Sales are negatively correlated, As Current Assets to Total Assets Ratio decreases Return on Sales increases. The co-efficient of determination r^2 shows that Working Capital to Total Assets Ratio accounts for 2.04 per cent of variation in the Return on Sales.

Return on Equity and Return on Sales are positively correlated, as increase in Return on Equity leads to increase in Return on Sales. The co-efficient of determination r^2 shows that Return on Equity accounts for 1.63 per cent of variation in the Return on Sales. Return on Total Assets and Return on Sales are positively correlated, as increase in Return on Total Assets leads to increase in Return on Sales. The co-efficient of determination r^2 shows that Return on Total Assets Ratio accounts for 82.62 per cent of variation in the Return on Sales.

Operating Ratio and Return on Sales are positively correlated, As Operating Ratio increases Return on Sales increases. The co-efficient of determination r^2 shows that Operating Ratio accounts for 93.31 per cent of variation in the Return on Sales. Total Debt to Total Assets Ratio and Return on Sales are negatively correlated, As Total Debt to Total Assets Ratio decreases Return on Sales increases. The co-efficient of determination r^2 shows that Total Debt to Total Assets Ratio accounts for 7.84 per cent of variation in the Return on Sales.

Debt-Equity Ratio and Return on Sales are negatively correlated, As Debt-Equity Ratio decreases Return on Sales increases. The co-efficient of determination r^2 shows that Debt-Equity Ratio accounts for 2.34 per cent of variation in the Return on Sales. Long Term Debt Equity Ratio and Return on Sales are negatively correlated, As Long Term Debt Equity Ratio decreases Return on Sales increases. The co-efficient of determination r^2 shows that Long Term Debt Equity Ratio accounts for 2.52 per cent of variation in the Return on Sales.

Step Wise Multiple Linear Regression Analysis:

The step wise multiple regression is a variation of the forward technique except that time a new predictor variable is stepped in, the new relationship between the criterion and predictor variable is revaluated to see whether the predictor variable already selected is still significantly contribute when variables are added later. It is possible that a predictor entered earlier may be dropped out later when new predictors are brought into the equation.

Table 4: Financial Performance of Indian Automobile Industry – Using Step Wise Multiple Linear Regression Analysis

Model	Constant	X_{10}	X_{20}	X_{17}	X_8	X_2	X_{16}	X_{18}	X_1	X_{12}	r^2
1	-7.677	0.943									0.934
2	-5.321	0.94	-2.721								0.952
3	-3.973	0.938	-3.972	-1.013							0.961
4	-2.747	0.778	-3.886	-1.01	0.219						0.967
5	-0.374	0.808	-3.297	-0.876	0.181	-2.099					0.971
6	1.202	0.789	-2.956	-0.795	0.198	-2.171	-3.764				0.972
7	0.696	0.793	-6.491	-0.575	0.194	-2.023	-4.722	2.921			0.973
8	-0.587	0.8	-6.113	-0.551	0.191	-3.855	-5.153	2.714	2.355		0.974
9	-3.68	0.798	-6.388	-0.536	0.2	-4.124	-3.883	2.97	3.05	0.151	0.975

It is found in the Table: 4 that step wise linear regression introduced the variable 'Operating Ratio' in the first step. This contributes 93.40 per cent to variation in Return on Sales. 'Long Term Debt Equity Ratio' is introduced in step two. This variable along with 'Operating Ratio' has accounts for 95.20 per cent. The contribution was increased by 1.08 per cent. In the third step 'Net Fixed Assets to Equity Ratio', the third variable has increased the contribution from 95.20 percent to 96.10 per cent. The contribution further increased by 0.60 per cent to 96.70 per cent in fourth step, with introduction of variable 'Return on Total Assets'.

'Quick Ratio is introduced in step five. This variable along with 'Operating Ratio, Long Term Debt Equity, Net Fixed Assets to Equity, Return on Total Assets and Quick Ratio has accounts for 97.10 per cent. The contribution was increased by 0.40 per cent. The contribution further increased by 0.1 per cent to 97.2 per cent, with introduction of variable 'Total Debts to Total Assets Ratio' in the sixth step.

'Debt Equity Ratio' is introduced in step seven and it contributes further 0.1 percent.' Current Ratio' is introduced in step eight and it contributes 0.1 percent along with the other variable. The last variable is 'Inventory Turnover Ratio' introduced in the step nine. The total contribution of these nine variables

amounts to 97.5 per cent. The r^2 of Multiple Regression Analysis of post foreign direct investment period amounts to 99.9 per cent. The difference of 2.4 per cent is due to contribution by other variables.

Findings:

The study reveals that the independent variables collectively explain 99.9 percentage of the total variations in the profitability. It is proved that profitability of the Indian Automobile Industry is highly dependent on Operating Ratio. The equity capital of Ashok Leyland Ltd, Hero Motorcorp Ltd, Hundai Motors Ltd, Mahendra & Mahendra Ltd Maruti Suzuki Ltd and Tata Motors Ltd were highly increased but in Atul Auto Ltd, Kinetic Engineering Ltd, Maharashtra Scooters Ltd, Majestic Auto Ltd and Scooters India Ltd were increased at a lower rate. Operating Ratio accounts for 93.31 per cent of variation in the Return on Sales as per step wise linear regression. This contributes 93.40 per cent to variation in Return on Sales.

Suggestions:

- The burden of interest has produced a decline effect and reduced the percentage of net profit. It is suggested that a study of productivity and financial efficiency of the Indian Automobile Industry. The few companies, which did not follow a definite policy of financing fixed assets, should follow such policy.
- To strengthen the financial efficiency, long-term funds have to be used to finance core current assets and a part of temporary current assets. It is better if the companies can reduce the over sized short term loans and advances and eliminate the risk by arranging finance regularly.
- Improper planning and delays in implementation of projects lead to rise in their cost. So proper planning should be made. To regularize and optimize the use of cash balance, proper techniques may be adopted for planning and control of cash. The investments in inventories should be reduced.
- The companies should use widely the borrowed funds and should try to reduce the fixed charges burden gradually by decreasing borrowed funds and by enhancing the owner's fund. For this purpose, companies should enlarge their equity share capital by issuing new equity shares.
- Government of India may take measure to reduce the tax levied; excise duty on specified parts of hybrid vehicles. This may leads to reduction in excise duty on specific parts supplied to manufacturers of electrical and hybrid vehicles will promote the growth of environment-friendly cars.

Conclusion:

Indian automobile sector has huge demands from its own country. This demand also attracts the giant automobile suppliers throughout the world to come and invest in the Indian automotive industry. Due to the contribution of many different factors like sales incentives, introduction of new models as well as variants coupled with easy availability of low cost finance with comfortable repayment options, demand and sales of automobiles are rising continuously. Today, this sector has emerged as a sunrise sector. However, the overcapacity problem is haunting many of the players as demand may not go up significantly. Hence, many players are looking for an external market for Indian automobiles. The findings of the study strongly suggest the Government should encourage export of this industry by providing required infrastructure and reliefs to enhance performance. It should continue the importance given to this industry to have a better growth of our economy. The Indian automotive sector has the potential to generate up to US$ 300 billion in annual revenue by 2026, create 65 million additional jobs and contribute over 12 per cent to India's Gross Domestic Product, as per the Automotive Mission Plan 2016-26 prepared jointly by the Society of Indian Automobile Manufacturers (SIAM) and government.

References:

[1] A. Dharmaraj, Dr. N.Kathirvel Analysing the Financial Performance of Selected Indian Automobile Companies, *Global Journal For Research Analysis*, Vol:II, Issue:IV April 2013

[2] A.Dharmaraj, Dr.N.Kathirvel Financial Performance of Indian Automobile Industry– A Comparative Study During Pre and Post Foreign Direct Investment, *International Journal of Scientific Research*, Vol : 2, Issue : 9 September 2013

[3] Adolphus J.Toby (2008), Liquidity performance relationship with Nigerian manufacturing companies (1990-2002) Finance India, Vol. II, Issue 3, Mar.2008, pp.117-131.

[4] Agarwal, R. N. (1991). Profitability and growth in Indian automobile manufacturing industry. *Indian Economic Review*, 81-97.

[5] Aggarwal, N. and Singla, S.K. (2001), How to develop a single index for financial performance, Indian Management, Vol .12, No.5, pp.59-62.

[6] Ahmed Arif Almazari (2012) - Financial Performance Analysis of the Jordanian Arab Bank by Using the DuPont System of Financial Analysis - International Journal of Economics and Finance Vol. 4, No. 4; April 2012 Pp. 86 -94.

[7] Burange L.G and Shruti Yamini (2008), Performance of Indian Cement Industry: the Competitive Landscape, the Journal of Finance, Vol.39, No.1, April 2008, pp.127-145.

[8] Chandra H and Selvaraj A (2013), A study on financial health of the selected Indian steel companies", SMART Journal of Business Management Studies, Vol.9, No.1, pp.36-42.

[9] Debaprosanna Nandy (2011), Multivariate analysis approach of selecting profitability indicators – An empirical study of commercial banks in India, Zenith International Journal of Multidisciplinary Research, Vol.1 Issue 6, October 2011, pp 1-18

[10] Dharmendra S. Mistry (2011), Performance appraisal of Indian two wheeler industry, GITAM Journal of Management Vol.9 No.4, pp 65-82.

[11] Giulio Bottazzi, Angelo Secchi and Federico Tamagni (2008), Productivity, Profitability and financial performance, Published by Oxford University, (2008) pp.45-65.

[12] Hamasalakshmi R (2009), 'Financial Analysis of Selected Indian Software Companies', Finance India, Vol. XXVI, No.3, September 2012, pp.955-960

[13] Jagan Mohan Rao, P (1993). Financial Appraisal of Indian Automotive Tyre Industry, Finance India, Vol.VII, No.3, pp.683-685.

[14] Janaki Ramudu P and Parasuraman N.R (2012), Growth in Sales Compared with Changes in Profitability and in Working Capital – A Study of Indian Pharmaceutical Industry, Journal of Accounting and Finance, Vol.26, Issue.1, pp 3-12.

[15] Juliet D' Souza and William L. Megginson, (1999). Financial and operating performance of privatized firms during the 1990s, The Journal of Finance, Vol. LIV, No.4, pp.1397-1434.

[16] Kamalnath.P (2010), A Study on Working Capital Management and Profitability of Automobile Companies in India, Unpublished Ph.D dissertation submitted to Bharathiyar University, Coimbatore.

[17] Krishnaveni. M (2008), Performance appraisal of an Indian chemical industry after liberalization, Finance India, Sep.2008, Vol. 22, No.3, pp.571-580.

[18] Lind, L., Pirttilä, M., Viskari, S., Schupp, F., & Kärri, T. (2012). Working capital management in the automotive industry: Financial value chain analysis.*Journal of purchasing and supply management*, *18*(2), 92-100.

[19] Muthumoni. A (2008) "A Study on the performance appraisal of Indian Automobile Industry", Ph.D Dissertation submitted to Bharathidasan University, 2008.

[20] Neha Mittal (2012), Determinants of capital structure of Indian industries, Journal of Accounting and Finance, Volume 25, No: 1, pp.32-40.

[21] Rajalakshmi K and Ramachandran T (2011), Impact of Foreign Direct Investment on India's Automobile Sector-With Reference to Passenger Car Segment, Research journal of Science and IT Management, Vol.1, Issue 1, Nov 2011, pp. 22-41.

[22] Rakesh Kumar Manjhi and S.R. Kulkarni(2012), Working Capital Analysis and Liquidity Analysis: An Empirical Research on Gujarat Textiles Manufacturing Industry. Indian Journal of Finance, August 2012, pp 25-35.

[23] RBI Bulletin (2005), Financial performance of private corporate business sector, Finance India, Vol. IX, No.4, pp.901-908.

[24] Saranga, H. (2009). The Indian auto component industry–Estimation of operational efficiency and its determinants using DEA. *European Journal of Operational Research*, *196*(2), 707-718.

[25] Sarumathi I (2010) analysed the financial performance of Hero Honda Motors and TVS Motors in Two Wheeler Automobile industry, Unpublished Ph.D dissertation submitted to Bharathiyar University, Coimbatore.

[26] Sharma Manisha and Prashaant Anu (2009), An Analysis of Performance of the Indian Textile Industry in Quota Free Regime. Paradigm (Institute of Management Technology), 2009, Vol. 13, Issue 2, pp.98-109

[27] Shishir Pandey (2012), Financial Structure and Profitability of IFCI Ltd.: An Empirical Analysis, Indian Journal of Finance, October 2012, pp 32-38.

[28] Shurveer S. Bhanawat (2011), "Impact of Financial Crisis on the Financial Performance of the Indian Automobile Industry", Working paper, ssrn.

[29] Swati Dhaval Modi (2012), A Study on the Adequacy and Efficacy of Working Capital in Automobile Industry in India, The IUP Journal of Accounting Research & Audit Practices, Vol. XI, No. 2, April 2012, pp. 69-90.

[30] Tushkar K. Mahanti (2013) "Saving Spending Splurging", Business Economics, January 2013, pp 20-25.

[31] Velu Suresh Kumar (2011), "Indian Automotive Industry: Performance Analysis", Political Economy Journal of India, Vol. 2, No. 2, pp 1-7.

[32] Vijayakumar, D. (2011). Cash Conversion Cycle and Corporate Profitability–An Empirical Enquiry in Indian Automobile Firms. *International Journal of Research in Commerce, IT & Management*.

[33] Vijayakumar, D. A. (2011). The Determinants of Profitability: An Empirical Investigation Using Indian Automobile Industry. International journal of research in commerce & management.

[34] http://www.ibef.org/industry/india-automobiles.aspx

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