

Study the Relation between Working Capital System and Profitability in Auto Manufacturing Industry in India

Fatemeh Jafari

Andhra University, College of Arts and Commerce: Department of Commerce and Management

Abstract

The new economic policy adopted in India in 1991 known as Liberalization, Privatization and Globalization (LPG model). This policy has been designed to make the Indian economy progressively market oriented and integrate it with the emerging global economy structure. Therefore, in line with this policy it was very indispensable to analyze the working management and some financial ratios in some selected Auto manufacturing companies. The purpose of the study was to analyze the practice of working capital Management and Asset and liquidity ratios in six selected Indian auto manufacturing companies. For this aforementioned study, a time series data for the years 2003- 2012 has been employed and a secondary data from the annual reports of the six companies was solicited. Both qualitative and quantitative paradigms were employed so as to analyze the research. Regarding the relation between working capital and turnover analysis, index of inventory turnover, debtors turnover ratio, total assets turnover ratio and fixed assets turnover ratio were used. . The minimum inventory turnover ratio chain index among all selected companies was founded in Ashok Leyland in 2009-2010 that was 74.60 and the maximum was founded in Maruti Suzuki that was 214.76 in 2010-2011. TVS Motor was denoted by the minimum debtors turnover ratio chain index among all selected companies in 2009-2010 that was 55.68 and the maximum debtors turnover ratio chain index was in Maruti Suzuki that was 438.51 in 2010-2011. TVS Motor was denoted by the minimum total assets turnover ratio chain index among all selected companies in 2008-2009 that was 43.15 and the maximum was Ashok Leyland in 2006-2007 that was 176.92. . The minimum fixed assets turnover ratio chain index among selected companies was founded in Ashok Leyland in 2009-2010 that was 61.94. The maximum fixed assets turnover ratio chain index among selected companies was founded in Hero MotoCorp in 2005 -2006 that was 174.41.

Keywords: Turnover, profitability, "Working capital Auto manufacturing companies"

1. Introduction

The new economic adopted in India known as Liberalization, Privatization and Globalization (LPG model) in 1991. This policy designed to make the Indian economy progressively market oriented and integrate it with the emerging global economy structure. Due to advance technology and precise research and development activity Indian auto- mobiles industries have made significant growth in last decades. After LPG began a number of foreign firms commenced joint ventures with existing Indian automobile companies. The variety of options of automobiles available to the consumers. Fixed and working capital are necessary financial requirement of any industry to run through their relative share and importance varies according to the nature of the industry. Implementing an effective working capital management system helps to improve the earnings of the firm. The ratio analysis and management of individual components of working capital are two main aspects of working capital management. Working capital management system involves the relationship between short-term assets and short-term liabilities of the firm. The goal of working capital management system is to ensure that the firm is able to continue its operations and that it has sufficient ability to satisfy maturing short-term debt. The working capital management system engages the managing of inventories, accounts receivable and payable, and cash. Considering the role and importance of working capital systems in the success of the companies, this project aims to study the relation between working capital management system and profitability of auto-manufacturing companies in India. The working capital management system has an effect on the liquidity as well on the profitability of the firm. So, it is important to study the role of working capital in the profit generating process. If the firm desire to improve liquidity, increases the size of working capital of the firm. On the other hand, If a company is interested to obtain a greater risk for greater profits, it decreases the size of working capital in relation to its sales. The firm should tradeoff between its profitability and liquidity and decides the size of its working capital requirement. The objective of any firm is to maximize the profit. But, maintaining liquidity of the firm is an important objective also. If profit increase in the cost of liquidity can bring serious problems to the firm. As both the objectives are important, therefore achieving of one objective should not be at the cost of the other. If the firm doesn't have optimum liquidity, it may face the problem of insolvency or bankruptcy conversely, If the firm does earn optimum profit it cannot survive for a longer period. For these reasons working capital management should be given proper consideration.

2. Literature Review (Empirical Review)

V. Sarangarajan and Dr. S. A. Lourthuraj (2013)1, in their research paper titled, “*Asset management efficiency of selected cement companies in Tamil Nadu*”. The researchers collected data from ten cement companies for the year 1996 to 2006. The study was designed on the basis of secondary sources of information on financial data. They used Data Envelopment Analysis by an application of Kinsey DEA analysis used for benchmarking software professional version to find out the asset efficiency of the cement industry. Simple statistical tools such as standard deviation, standard error of the sample were used to carry out the research. The results clearly stated that the cement companies in Tamil Nadu have efficiently utilized their fixed assets and current assets to maximize the return in the form of sales, except during the year 1997 to 1999 and 2002 to 2003. This was mainly possible because of the increase in capacity with the existing facilities and also the companies had developed their current asset management. They had suggested that if the assets were efficiently used, it would result in an increase in sales.

Sarangarajan, Dr. Ananth and Dr. Lourthuraj (2013)2, in their research paper titled, “*Financial Performance Efficiency of Select Cement Companies in Tamil Nadu*”, collected data from ten cement companies from 1996-1997 to 2005-2006. The study designed for base of secondary sources of information on financial data. The authors applied Data Envelopment Analysis by an application of KonSI DEA Analysis for Benchmarking Software Professional Version 15 to find out the overall financial performance efficiency. The result indicated that the cement industry performance was good in Tamil Nadu only during 1997, 1998 and 2004 but the rest of the years the industries should improve their financial performance.

Padachi (2006)4, in his research paper titled, “*Trends in Working Capital Management and its Impact on Firms’ Performance: An Analysis of Mauritian Small Manufacturing Firms*”. The researcher examined the trends in working capital management and its impact on firms’ performance a sample of 58 small manufacturing firms for the period 1998-2003. The key variables used in the analysis were inventoried days, accounts payable days, accounts receivable days and the cash conversion cycle. Profitability is a dependent variable and return on total assets is used as a measure of profitability. The result indicated that with high investment in inventories and receivables, there is lower profitability. An investigation of the profitability, liquidity and operational efficiency of the five industries indicated significant changes and the paper and printing industry has been able to achieve high scores on the various components of working capital and this has positively impacted on the profitability of these firms.

R.N. Agarwal (1982)6, in his research paper titled, “*Investment and Financing Behavior of Indian Automobile Manufacturing Industry*”. The researcher analyzed the total inventory investment equation for individual firms in automobile manufacturing industry, which was divided into two sectors - cars-sectors and non-car sectors core and non-core sectors. Data had been taken from the Stock Exchange Official Directory, Mumbai for the period 1959-60 to 1978-79. Cost of capital and trend were significant in the car (core) sector and in non-core sector fixed investment and flows of external funds were significant. The study indicated that the important explanatory variables were sales and stock-sales ratio in both sectors. Existing stocks of inventories possessed negative coefficient and statistically significant in both the sectors. In explaining inventory investment behavior, several other variables as dividends, capacity utilization and liquidity ratio were found to be of no significance.

P.V. George (1972)7, in his research paper titled, “*Inventory Behavior and Efficacy of Credit Control*”. The researcher analyzed the balance sheet data of 52 public limited companies covered during the period of 1967 to 1970. The accelerator, external and internal finance variables were measured in the equations for raw materials, including total inventories and goods-in-process. The only output variable was equations for finished goods inventories. He mentioned that the accelerator and external finance variables were important.

Vinod Prakash (1970)8, in his research titled, “*Inventories in a Developing Economy*”. It was a time series analysis with mostly undefeated data taken from CMI and Annual Survey of Industries (ASI) for the period 1946-63. It examined the influence of structural changes in manufacturing activity on the relative size and composition of inventory in the large scale-manufacturing sector in India. Three different models for industry groups and for six important individual industries had been tried. Output/sales, capacity utilization, short-term rate of interest, money supply, foreign exchange availability, and price index, size and time trend were taken as explanatory variables. The simple accelerator model with output gave better results for industrial groups, whereas the ratio model seemed to perform better in the analysis of individual industry. The flexible accelerator models were found to be inferior. The impact of price index was found to be generally insignificant, while the impact of foreign exchange and money supply was absent. The rate of interest showed a perverse impact. Time trend appeared to be more important than the size of establishment. The role of availability of funds was

completely ignored in this study.

According to *Krishnamurthy & Sastry (1970)*, paper titled, “*Inventories in Indian Manufacturing*”. The researchers used CMI data and the consolidated balance sheet data of 21 industries over the period 1946 to 62 by public limited companies which were published by RBI. They investigated the major components, i.e. raw material, goods-in-process and finished goods in their study and they also used inter-industry cross section analysis. Accelerator denoted by a change in sales, short-term interest rate and bank financing were found to be significant factors. Utilization of productive capacity and price anticipations were found to be important determinants.

3. Data and Methodology

The general objective of the study is to study the working capital management practices in some selected Auto manufacturing companies in India. Samples of Six Auto Manufacturing Companies were taken for the study. A time series data for year 2003- 2012 has been collected from secondary sources. Both qualitative and quantitative approaches of a research have been employed for analysis. Ratio Analysis has been employed in order to analyze the relationship and practice of working capital management and other its components. The secondary data were collected from the annual reports of the companies for the period 2003-2012. Index analysis has been used for the analysis purpose.

3.1. Research Questions and Hypothesis

As presented in the above the broad objectives of the thesis are the working capital management practices in some selected Auto manufacturing companies in India. To achieve this broad objective, a series of research questions and hypotheses are developed. Thus, the primary research question is:

RQ: What are the different analysis and determinants of working capital management and how is the trend analysis is done?

A hypothesis is a prediction about the state of the world (Field, 2009). A regression analysis tests hypotheses- by determining which predictor variables (independent variables) contribute substantially to the regression model's ability to predict the outcome (dependent variable), or explain the variability in the dependent variable. Predictor variables should only be included in a regression analysis if there are sound theoretical reasons for expecting them to influence the dependent variable (Field, 2009). In order to determine the variables that could influence the internal and external tax compliance costs, a review of the literature was performed.

The study tests whether the selected variables of sample companies vary significantly during the course of the study. These specific hypotheses have been at the appropriate time while to analyze and interpreting the results. The following hypotheses were developed:

H1: – There is a significant difference between efficient working capital management system and profitability of auto-manufacturing industry in India.

3.2. Sample design

In the case of sample design, as the literature on survey method reveals, how well a sample represents a population depends on the sample frame, the sample size and the specific procedures of selecting potential respondents (Wollela Abehodie, 2008). Obviously, in the auto manufacturing industry survey, the **sample frame** ought to be the list of registered auto manufacturing industry population in India. That is, the sample needed to be chosen from the auto manufacturing industry registry of India. Accordingly, to select potential respondents, the list of the auto manufacturing industry registered in India in the year 2012/13 fiscal year were accessed. The other consideration in sample design is the **sample size**. The choice of the sample size has a bearing on the reliability of a study. However; this does not mean that large sample size leads to high level of accuracy. Rather, it is to indicate that the sample size is one of the factors that contribute to the credibility of a survey estimate (Sarantakos; 2005). The sample size will depend on the type of research and what the researcher wants to do with the results. Choosing an appropriate sample size is crucial to have a study that will provide statistically significant results. Research needs to be cost effective, so it is best to use as small sample as possible to reduce time and cost.

However, if using a sample size that is too small, the results will not be statistically valid. In quantitative research, statistical methods can be used to choose the size of sample required for a given level of accuracy and the ability to make generalizations.

In the year 2011, there were 3,695 auto-manufacturing industry were registered in all of India. From this study population, the researcher was listed 6 of the total population, which is equivalent to above most similar surveys: which is listed in the literature review. Considering the concentration of auto-manufacturing industries of the

country, this sample frame again congregates among 3 cities (Mumbai, New Delhi and Chennai) by purposive sampling method and from each city auto-manufacturing industries were randomly selected as sample by simple random method of sample selection.

4. Result and Discussion

In this Part the result for profitability and working capital is thoroughly presented and for this end different Asset ratios are employed.

4.1. Turnover ratios

4.1.1. Inventory Turnover Ratio

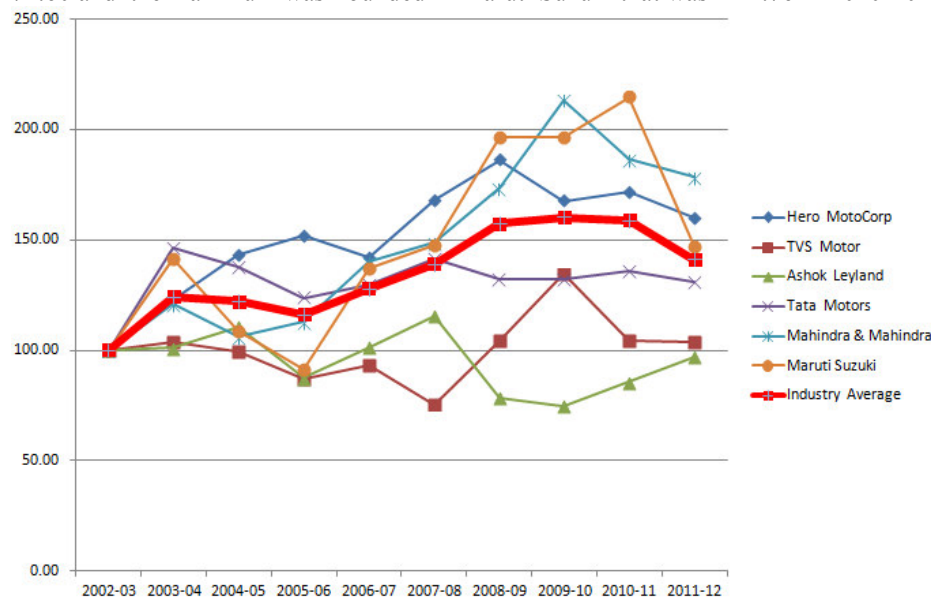
The inventory turnover ratio measures the efficiency of the company in selling and replaced its entire batch of inventory during the fiscal year.

Table 1.1: Inventory Turnover Ratio Chain Indices of Automobile Industries in India

Year	Hero		TVS		Ashok		Tata		Mahindra &		Maruti		Industry	
	MotoCorp		Motor		Leyland		Motors		Mahindra		Suzuki		Average	
	ITR	Index	ITR	Index	ITR	Index	ITR	Index	ITR	Index	ITR	Index	ITR	Index
2002-03	25.51	100.00	12.73	100.00	6.85	100.00	10.20	100.00	8.39	100.00	15.52	100.00	13.20	100.00
2003-04	31.30	122.70	13.22	103.85	6.92	101.02	14.91	146.18	10.14	120.86	21.94	141.37	16.41	124.28
2004-05	36.57	143.36	12.69	99.69	7.59	110.80	14.06	137.84	8.92	106.32	16.90	108.89	16.12	122.13
2005-06	38.74	151.86	11.06	86.88	5.99	87.45	12.63	123.82	9.48	112.99	14.15	91.17	15.34	116.22
2006-07	36.25	142.10	11.86	93.17	6.93	101.17	13.26	130.00	11.75	140.05	21.27	137.05	16.89	127.93
2007-08	42.82	167.86	9.61	75.49	7.90	115.33	14.44	141.57	12.49	148.87	22.93	147.74	18.37	139.13
2008-09	47.53	186.32	13.31	104.56	5.36	78.25	13.47	132.06	14.56	173.54	30.46	196.26	20.78	157.44
2009-10	42.80	167.78	17.12	134.49	5.11	74.60	13.50	132.35	17.91	213.47	30.47	196.33	21.15	160.24
2010-11	43.88	172.01	13.27	104.24	5.86	85.55	13.86	135.88	15.64	186.41	33.33	214.76	20.97	158.89
2011-12	40.84	160.09	13.19	103.61	6.63	96.79	13.37	131.08	14.99	178.67	22.80	146.91	18.64	141.19
Company Average	38.62	151.41	12.81	100.60	6.51	95.09	13.37	131.08	12.43	148.12	22.98	148.05	17.79	134.74

Sources: Computed from Annual Reports

The minimum inventory turnover ratio chain index in Hero MotoCorp was 100.00 in 2002-2003, TVS Motor was 75.49 in 2007-2008, Ashok Leyland was 74.60 in 2009-2010, Tata Motors was 100.00 in 2002-2003, Mahindra & Mahindra was 100.00 in 2002-2003 and Maruti Suzuki was 91.17 in 2005-2006. The maximum inventory turnover ratio chain index in Hero MotoCorp was 186.32 in 2008 -2009, TVS Motor was 134.49 in 2009-2010, Ashok Leyland was 115.33 in 2007-2008, Tata Motors was 146.18 in 2003-2004, Mahindra & Mahindra was 213.47 in 2009-2010 and Maruti Suzuki was 214.76 in 2010-2011. The minimum inventory turnover ratio chain index among all selected companies was founded in Ashok Leyland in 2009-2010 that was 74.60 and the maximum was founded in Maruti Suzuki that was 214.76 in 2010-2011.



Graph 1.1: Inventory Turnover Ratio

The index of the inventory turnover ratio of Hero Motocorp increased to 160.09 in 2011-2012 over 2002-2003 accounting for a rise of 60.09 percent, simultaneously, there were certain changes in a decade. The index of the ratio went up by 22.70 percent, i.e. from 100.00 to 122.70 during the year 2003-2004 due to increase in sales and decreased inventory. The next two years, it increased gradually. It decreased gently in 2006-2007 by 9.76 percent. In the year 2007-2008 as the sales increased rapidly there was a rise in the index of the inventory turnover ratio of the company by 25.75 percent, i.e. from 142.10 to 167.86 in spite of the increase in inventory. It followed the next year. The index of the ratio decreased in 2009-2010 by 18.54 percent, i.e. from 186.32 to 167.78. It continued through the next two years. The index of the inventory turnover ratio of Tvs Motor increased to 103.61 in 2011-2012 over 2002-2003 accounting for a rise of 3.61 percent. During the course, there were some changes, the index of the ratio was marked by slight fluctuation from the year 2003-2007. It fell by 17.67 percent, i.e. from 93.17 to 75.49 during the year 2007-2008 as the sales decreased and the inventory increased. The next year there was a significant increase in the index of the inventory turnover ratio by 29.07 percent, i.e. from 75.49 to 104.56 due to the increase in sales and the decrease in the inventory. It followed the next year. The index of the ratio decreased noticeably by 30.24 percent, i.e. from 134.49 to 104.24 in 2010-2011 as the inventory increased sharply in spite of the increased sales. It continued the next year. Ashok Leyland showed a decrease in the index of the inventory turnover ratio to 96.79 in 2011-2012 over 2002-2003 accounting for a fall of 3.21 percent, despite the fact that, there were certain changes during the 10 years. The index of the ratio fluctuated from 2003-2005. It decreased by 23.36 percent, i.e. from 110.80 to 87.45 during 2005-2006 because the inventory rose tremendously even though the sales increased slightly. The next two years the index of the ratio increased significantly. But in 2008-2009 the index of the ratio decreased marginally by 37.08 percent, i.e. from 115.33 to 78.25 as the sales decreased and inventory increased. It continued the next year. The index of the ratio increased by 10.95 percent, i.e. from 74.60 to 85.55 in 2010-2011 due to the increase in sales in spite of the rise in inventory. It was followed the next year. The index of the inventory turnover ratio of Tata motors increased to 131.08 in 2011-2012 over 2002-2003 accounting for a rise of 31.08 percent. However, there were some alterations over a period of time, the index of the ratio rose strongly by 46.18 percent, i.e. from 100.00 to 146.18 in the year 2003-2004 as the sales increased and inventory reduced. It decreased slightly in 2004-2005 by 8.33 percent. It further decreased by 14.02 percent, i.e. from 137.84 to 123.82 during 2005-2006. The index of the ratio kept on fluctuating from 2006-2012. There was an increase in the index of the inventory turnover ratio of Mahindra & Mahindra to 178.67 in 2011-2012 over 2002-2003 accounting for an increase of 78.67 percent, although, there were some changes all through the decade. The index of the ratio increased by 20.86 percent, i.e. from 100.00 to 120.86 during the year 2003-2004 because of the sharp increase in sales and even the inventory increased gently. It fell by 14.54 percent, i.e. from 120.86 to 106.32 the next year. From 2005-2010 there was a considerable increase, though there was fluctuation in the index of the ratio. It decreased in 2010-2011 by 27.06 percent, i.e. from 213.47 to 186.41 as the inventory increased sharply, although there was a rise in sales. It followed the next year. The index of the inventory turnover ratio of Maruti Suzuki increased to 146.91 in 2011-2012 over 2002-2003 accounting for an increase of 46.91 percent. But, the index of the ratio altered over a period of time. It rose in 2003-2004 by 41.37 percent, i.e. from 100.00 to 141.37 as the sales increased and inventory declined. It decreased the next two years. There was a remarkable increase of 45.88 percent, i.e. from 91.17 to 137.05 during the year 2006-2007 as the sales increased sharply and the inventory rose slightly. It continued the next four years. During the year 2011-2012 the inventory increased and the sales decreased, which had an impact on the index of the inventory turnover ratio that decreased substantially by 67.85 percent, i.e. from 214.76 to 146.91. The actual of the average inventory turnover ratio of Hero Motocorp was tremendously higher than the industry average and it increased significantly over a period of time. Although the average sales were slightly lower than the average industrial sales, simply due to the low average inventory when compared to the average sales of the company which reflected in high average inventory turnover ratio. Tvs Motor was remarked by a lower rate of the actual average inventory turnover ratio when compared to the average industrial ratio due to lower average sales and low average inventory. The ratio increased slightly over a period of time. Ashok Leyland had the lowest actual average inventory turnover ratio than the industry average industrial due to lower average sales and average inventory. However the average inventory was higher when compared to the company's average sales and the ratio continued to decrease over a period of time. The actual average inventory turnover ratio of Tata Motors was lower than the actual industry average. Even though the average sales were greater than the average industrial ratio, just due to higher average inventory as compared to the average sales of the company resulted in lower average inventory turnover ratio. Mahindra & Mahindra's the actual average inventory turnover ratio was lower than the actual average industrial ratio as average sales were lower than the average industry, it increased considerably over the period of 10 years. The actual the average inventory turnover ratio of Maruti Suzuki was higher than the average industrial ratio. It increased gradually over the period of time. Though the average sales

were sound, but the average inventory was low when compared to the average sales of the company.

4.1.2. Debtors Turnover Ratio

This ratio shows how efficient a company can turn its accounts receivable into cash during a period. In other words, it is measuring a firm's effectiveness in extending credit as well as collecting debts.

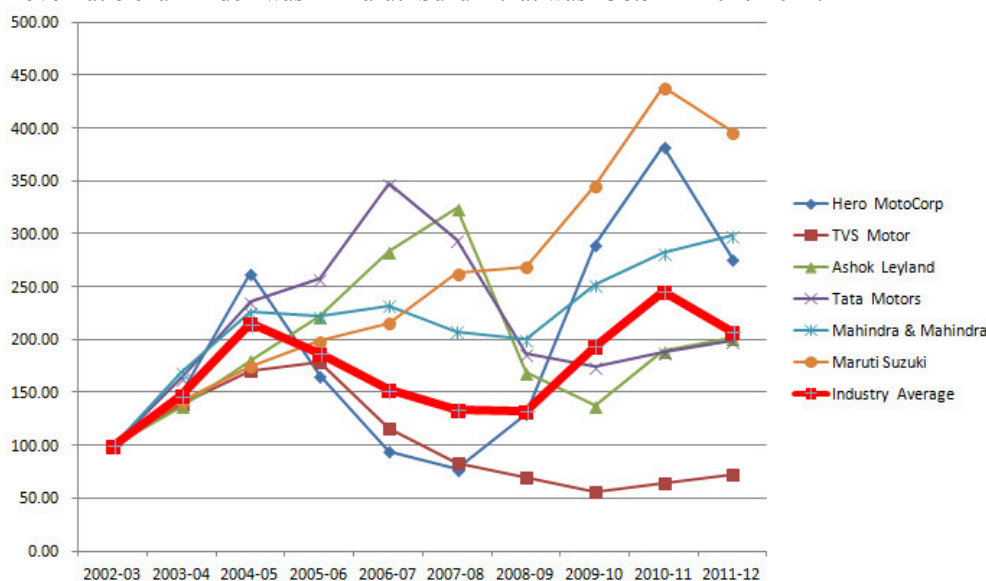
$$\text{Debtors Turnover Ratio} = \frac{\text{Net Credit Sales}}{\text{Average Accounts Receivable}}$$

Table 1.2: Debtors Turnover Ratio Chain Indices of Automobile Industries in India

Year	Hero MotoCorp		TVS Motor		Ashok Leyland		Tata Motors		Mahindra & Mahindra		Maruti Suzuki		Industry Average	
	DTR	Index	DTR	Index	DTR	Index	DTR	Index	DTR	Index	DTR	Index	DTR	Index
	2002-03	42.32	100.00	38.99	100.00	5.47	100.00	10.23	100.00	6.38	100.00	9.79	100.00	18.86
2003-04	63.02	148.91	54.18	138.96	7.49	136.93	16.69	163.15	10.75	168.50	13.89	141.88	27.67	146.69
2004-05	111.41	263.26	66.53	170.63	9.88	180.62	24.12	235.78	14.46	226.65	17.14	175.08	40.59	215.18
2005-06	70.26	166.02	69.76	178.92	12.14	221.94	26.31	257.18	14.16	221.94	19.45	198.67	35.35	187.38
2006-07	40.11	94.78	45.46	116.59	15.54	284.10	35.60	348.00	14.82	232.29	21.12	215.73	28.78	152.54
2007-08	32.70	77.27	32.31	82.87	17.74	324.31	30.08	294.04	13.26	207.84	25.76	263.13	25.31	134.17
2008-09	55.10	130.20	27.25	69.89	9.25	169.10	19.11	186.80	12.77	200.16	26.33	268.95	24.97	132.36
2009-10	122.63	289.77	21.71	55.68	7.51	137.29	17.92	175.17	16.09	252.19	33.92	346.48	36.63	194.19
2010-11	162.08	382.99	25.17	64.56	10.34	189.03	19.20	187.68	17.97	281.66	42.93	438.51	46.28	245.35
2011-12	117.09	276.68	28.24	72.43	11.02	201.46	20.42	199.61	19.05	298.59	38.84	396.73	39.11	207.33
Company Average	81.67	192.99	40.96	105.05	10.64	194.48	21.97	214.74	13.97	218.98	24.92	254.51	32.35	171.52

Sources: Computed from Annual Reports

The minimum debtors turnover ratio chain index in Hero MotoCorp was 77.27 in 2007-2008, TVS Motor was 55.68 in 2009-2010, Ashok Leyland was 100.00 in 2002-2003, Tata Motors was 100.00 in 2002-2003, Mahindra & Mahindra was 100.00 in 2002-2003 and Maruti Suzuki was 100.00 in 2002-2003. The maximum debtors turnover ratio chain index in Hero MotoCorp was 382.99 in 2010-2011, TVS Motor was 178.92 in 2005-2006, Ashok Leyland was 324.31 in 2007-2008, Tata Motors was 348.00 in 2006-2007, Mahindra & Mahindra was 298.59 in 2011-2012 and Maruti Suzuki was 438.51 in 2010-2011. TVS Motor was denoted by the minimum debtors turnover ratio chain index among all selected companies in 2009-2010 that was 55.68 and the maximum debtors turnover ratio chain index was in Maruti Suzuki that was 438.51 in 2010-2011.



Graph 1.2: Debtors Turnover Ratio

The index of the debtors turnover ratio of Hero Motorcorp increased to 276.68 in 2011-2012 over 2002-2003 accounting for an increase of 176.68 percent. Though, the index of the ratio changed over a period of 10 years, it

increased from 2003-2005, then decreased considerably from 2005-2006 by 97.24 percent, i.e. from 263.26 to 166.02. Accounts receivable increased quickly, which led to a substantial reduction in the index of the debtors turnover ratio by 71.24 percent, in 2006- 2007. It continued the next year. There was a gentle increase in 2008-2009 by 52.93 percent, i.e. from 77.27 to 130.20. Further, in 2009-2010 it had increased significantly 159.57 because of the noticeable increase in sales and a decline of debtor accounts. It continued the next year. It decreased again in 2011-2012 by 106.31 percent. The index of the debtors turnover ratio of Tvs Motor decreased to 72.43 in 2011-2012 over 2002-2003 accounting for a fall of 27.57 percent, on the other hand, there were certain changes all through the decade. The index of the ratio increased in 2003-2004 by 38.96 percent, i.e. from 100.00 to 138.96 and continued to increase in the succeeding two years. In 2006-2007 it decreased by 62.32 percent, i.e. from 178.92 to 116.59 because of the sharp rise in the account receivable of the company although the sales went up. It continued the next three years. Later, it increased gradually in 2010-2011 by 8.87 percent, i.e. from 55.68 to 64.56. It rose over the next two years. Ashok Leyland's index of the debtors turnover ratio increased to 201.46 in 2011-2012 over 2002-2003 accounting for a rise of 101.46 percent. During the course, there were certain changes, the index of the ratio rose by 36.93 percent, i.e. from 100.00 to 136.93. It continued to increase the next four years too. During the year 2008-2009 it decreased quickly by 155.21 percent, i.e. from 324.31 to 169.10 due to the increase in the large amount of account receivable and it followed the next year. Owing to the sharp increase in sales Ashok Leyland's the index of the debtors turnover ratio increased by 51.74 percent, i.e. from 137.29 to 189.03 in 2010-2011. It continued the next year. The index of the debtors turnover ratio of Tata Motors increased to 199.61 in 2011-2012 over 2002-2003 accounting for a rise of 99.61 percent. However, there were certain alterations over a period of 10 years, the index of the ratio increased in 2003-2004 by 63.15 percent, because of the increased sales and decrease in debtors account and it continued increasing till 2006-2007. Then it decreased considerably during 2007-2008 by 53.96 percent, i.e. from 348.00 to 294.04. It further decreased by 107.23 percent, i.e. from 294.04 to 186.80 in the year 2008-2009 due to increase in accounts receivable and decreased sales. It continued the next year. Later, it increased slightly in 2010-2011 by 12.51 percent, i.e. from 175.17 to 187.68. It continued to increase the next year. The Mahindra & Mahindra's index of the debtors turnover ratio rose to 298.59 in 2011-2012 over 2002-2003 accounting for an increase of 198.59 percent, despite the fact that, the index of the ratio altered over a period of time. It increased by 68.50 percent, i.e. from 100.00 to 168.50 in 2003-2004. It continued the next year. Then, it decreased slightly by 4.70 percent, in 2005-2006. It increased the next year. But the company increased its debtors account gradually which resulted in the decrease of ratio gently in 2007-2008 by 24.45 percent, i.e. from 232.29 to 207.84. It continued to decrease the next year. During 2009-2010 sales increased rapidly when compared to account receivable therefore the index of the debtors turnover ratio increased by 52.04 percent, i.e. from 200.16 to 252.19. It continued the next two years. There was an increase in the index of the debtors turnover ratio of Maruti Suzuki to 396.73 in 2011-2012 over 2002-2003 accounting for a rise of 296.73 percent, but, there were some changes in a decade. The index of the ratio rose in 2003-2004 by 41.88 percent, as sales went up and debtor account decreased. From 2004-2010 it continued to increase. The index of the ratio further increased by 92.03 percent, i.e. from 346.48 to 438.51 in 2010-2011 but, in 2011-2012 it decreased by 41.78 percent, i.e. from 438.51 to 396.73 because the accounts receivable and sales increased accordingly.

Hero Motocorp, Tvs Motor and Maruti Suzuki are the companies that share the similar age group. The actual average debtors turnover ratio of the Hero Motocorp was higher the actual average of the industry, although there was a moderate average sales, but due to the stringent credit policy abided by the company, the average account receivable was low when compared to the company's average sales, which reflected in the actual average debtors turnover ratio being tremendously higher than the actual average industrial ratio and it increased over a period of time. Tvs Motor had high actual average debtors turnover ratio than the actual average debtors turnover ratio of industry as the company had the problems of both low average sales and average account receivable, but because of the company's strict credit policy led to lower average account receivable when compared to average sales of the company. The trend increased slightly over a period of 10 years. The actual average debtors turnover ratio of Maruti Suzuki was lower than the actual industry average, but it was quite favorable than all the other listed companies. The company had higher average sales and the average debtors turnover was low when compared to the average sales of the company. The ratio increased significantly over a period of time. Ashok Leyland, Mahindra & Mahindra and Tata Motors are of similar age of establishment. Ashok Leyland had the lowest ratio of the actual average debtors turnover, but it marked a substantial increase over a period of time. The Company suffered from low average sales. The loose credit policy of the company resulted in the high average debtors. The low average sales and higher average debtors led to a low the average debtors turnover ratio.

The actual average debtors turnover ratio of Tata Motors is lower than the actual average industrial ratio due to line credit policy of the receivable account nevertheless the average sales were significantly high. Mahindra &

Mahindra had a low the actual average debtors turnover ratio due to lack of proper credit policy as the average receivable account was high when compared to average sales of the company and its increased noticeably over a period of 10 years.

4.1.3. Total Assets Turnover Ratio

The total asset turnover ratio measures a company's ability to generate sales of its total assets by comparing net sales with average total assets. It is an efficiency ratio that shows how efficiently a company can use its assets to generate sales.

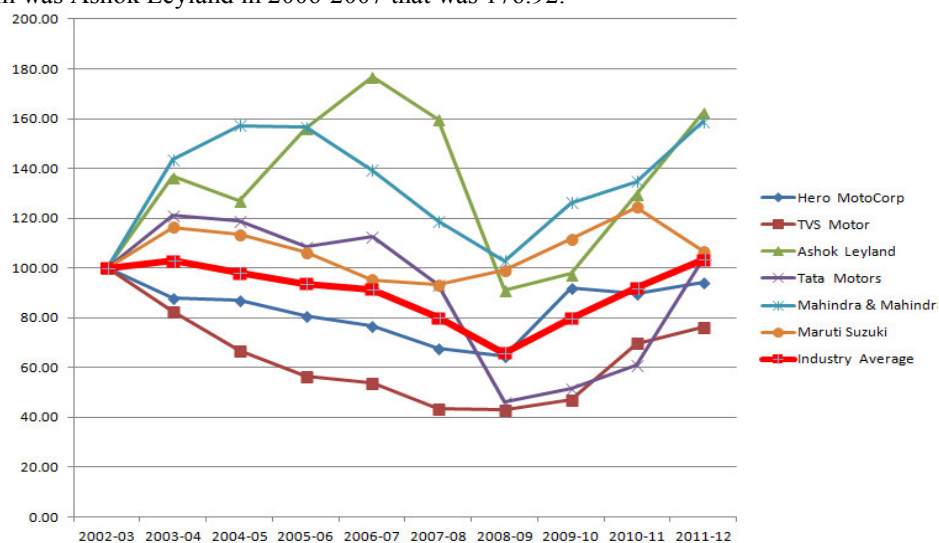
$$\text{Total Assets Turnover Ratio} = \frac{\text{Net Sales}}{\text{Average Total Assets}}$$

Table 1.3: Total Assets Turnover Ratio Chain Indices of Automobile Industries in India

Year	Hero		TVS		Ashok		Tata		Mahindra &		Maruti		Industry	
	MotoCorp		Motor		Leyland		Motors		Mahindra		Suzuki		Average	
	TATR	Index	TATR	Index	TATR	Index	TATR	Index	TATR	Index	TATR	Index	TATR	Index
2002-03	5.21	100.00	4.96	100.00	1.69	100.00	2.21	100.00	1.38	100.00	2.08	100.00	2.92	100.00
2003-04	4.58	87.91	4.09	82.46	2.31	136.69	2.68	121.27	1.98	143.48	2.42	116.35	3.01	103.02
2004-05	4.54	87.14	3.32	66.94	2.15	127.22	2.63	119.00	2.17	157.25	2.36	113.46	2.86	97.95
2005-06	4.20	80.61	2.81	56.65	2.64	156.21	2.40	108.60	2.16	156.52	2.21	106.25	2.74	93.67
2006-07	3.99	76.58	2.67	53.83	2.99	176.92	2.49	112.67	1.92	139.13	1.98	95.19	2.67	91.50
2007-08	3.52	67.56	2.16	43.55	2.70	159.76	2.06	93.21	1.64	118.84	1.94	93.27	2.34	79.98
2008-09	3.36	64.49	2.14	43.15	1.54	91.12	1.02	46.15	1.42	102.90	2.06	99.04	1.92	65.83
2009-10	4.80	92.13	2.33	46.98	1.65	97.63	1.14	51.58	1.74	126.09	2.32	111.54	2.33	79.75
2010-11	4.68	89.83	3.46	69.76	2.19	129.59	1.35	61.09	1.86	134.78	2.59	124.52	2.69	92.01
2011-12	4.91	94.24	3.79	76.41	2.75	162.72	2.29	103.62	2.19	158.70	2.22	106.73	3.03	103.54
Company Average	4.38	84.05	3.17	63.97	2.26	133.79	2.03	91.72	1.85	133.77	2.22	106.63	2.65	90.72

Sources: Computed from Annual Reports

The minimum total assets turnover ratio chain index in Hero MotoCorp was 64.49 in 2008-2009, TVS Motor was 43.15 in 2008-2009, Ashok Leyland was 91.12 in 2008-2009, Tata Motors was 46.15 in 2008-2009, Mahindra & Mahindra was 100.00 in 2002-2003 and Maruti Suzuki was 93.27 in 2007-2008. The maximum total assets turnover ratio chain in Hero MotoCorp was 100.00 in 2002-2003, TVS Motor was 100.00 in 2002-2003, Ashok Leyland was 176.92 in 2006-2007, Tata Motors was 121.27 in 2003-2004, Mahindra & Mahindra was 158.70 in 2011-2012 and Maruti Suzuki was 124.52 in 2010-2011. TVS Motor was denoted by the minimum total assets turnover ratio chain index among all selected companies in 2008-2009 that was 43.15 and the maximum was Ashok Leyland in 2006-2007 that was 176.92.



Graph 1.3: Total Assets Turnover Ratio

The index of the total assets turnover ratio of Hero Motorcorp decreased to 94.24 in 2011-2012 over 2002-2003 accounting for a fall of 5.76 percent. Though, the index of the ratio changed during the 10 years over a period, it decreased continuously from 2003-2009. In 2009-2010 the index of the ratio increased considerably by 27.64

percent, i.e. from 64.49 to 92.13 due to the fall in total assets of the company. The next year total assets turnover ratio, reduced slightly by 2.30 percent. Again, it increased in 2011-2012 by 4.41 percent, i.e. from 89.83 to 94.24. The index of the total assets turnover ratio of Tvs Motor declined to 76.41 in 2011-2012 over 2002-2003 accounting for a fall of 23.59 percent, on the other hand, there were certain alterations during the time period of 10 years. The index of the ratio declined in 2003-2004 by 17.54 percent, because the rate of total assets increased greater than the rate of net sales. The index of the total assets turnover ratio from 2004-2009 decreased gently and then went up in 2009-2010 by 3.83 percent, i.e. from 43.15 to 46.98. In 2010-2011 the index of the total assets turnover ratio of Tvs Motor increased swiftly by 22.78 percent, i.e. from 46.98 to 69.76 because the net sales increased rapidly and there was a slight decrease in total assets. It followed the next year. Ashok Leyland's index of the total assets turnover ratio increased to 162.72 in 2011-2012 over 2002-2003 accounting for a rise of 62.72 percent. The index of the ratio altered over a period of time, The company's net sales increased rapidly in 2003-2004, which is reflected by a marked increase in the index of the total assets turnover ratio by 36.69 percent, i.e. from 100.00 to 136.69. Then the index of the ratio declined slightly by 9.47 percent, in the next year. During the year 2005-2006 there was a significant rise by 28.99 percent, i.e. from 127.22 to 156.21 later, it increased gradually. During 2007-2008 it decreased by 17.16 percent. The index of the ratio further reduced dramatically by 68.64 percent, i.e. from 159.76 to 91.12 in 2008-2009 due to the rise in total assets and a decrease in net sales. From 2009-2012 the index of the ratio rose substantially. The index of the total assets turnover ratio of Tata Motors increased to 103.62 in 2011-2012 over 2002-2003 accounting for a rise of 3.62 percent. However, in the due course of 10 years the ratio altered. The index of the ratio rose considerably by 21.27 percent, i.e. from 100.00 to 121.27 in 2003-2004 because the net sales increased rapidly. Then the index of the ratio decreased gradually. During the year 2008-2009 the index of the total assets turnover ratio of the company plunged down to 47.06 i.e. from 93.21 to 46.15 due to the large increase of total assets. In the next year the index of the ratio increased slightly by 5.43 percent. It followed the next year. In 2011-2012 the total assets, reduced significantly and net sales rose rapidly, which resulted in the further dramatic rise in the index of the ratio of Tata Motors by 42.53 percent, i.e. from 61.09 to 103.62. The Mahindra & Mahindra's index of the total assets turnover ratio were increased to 158.70 in 2011-2012 over 2002-2003 accounting for a rise of 58.70. During the course, there were certain changes. The index of the ratio increased in 2003-2004 by 43.48 percent, i.e. from 100.00 to 143.48 because of more net sales with less total assets. Then the index of the ratio decreased continuously from 2005-2007. It further decreased marginally by 20.29 percent, i.e. from 139.13 to 118.84 in 2007-2008. It followed the next year. The index of the total assets turnover ratio of Mahindra & Mahindra in 2009-2010 went up by 23.19 percent, i.e. from 102.90 to 126.09 because the rate of net sales increased greater than the rate of total assets and it continued the next two years. The index of the total assets turnover ratio of Maruti Suzuki increased to 106.73 in 2011-2012 over 2002-2003 accounting for a rise of 6.73. Although, there were some changes all through the decade, the index of the ratio increased in 2003-2004 by 16.35 percent, i.e. from 100.00 to 116.35 because the net sales increased rapidly. Then the index of the ratio declined slowly from 2004-2008. Subsequently, it increased in year 2008-2009 by 5.77 percent. It continued to increase the next two years too. During the year 2011-2012 the index of the ratio of Maruti Suzuki decreased by 17.79 percent, i.e. from 124.52 to 106.73. The Hero Motorcorp, Tvs Motor and Maruti Suzuki shared the similar age of establishment. The actual average of total assets turnover ratio of The Hero Motorcorp was tremendously higher than the actual average industry ratio but it decreased over a period time. When compared to the average net sales, the company average total assets were lower than the average sales, which lead to a higher ratio of the actual average of total asset turnover. The actual average total assets turnover ratio of Tvs Motors was higher than the total industrial average, however, it decreased in the consequent 10 years. The company suffered from low average sales and less average value of total assets. Comparatively the average of total asset value was lower than the average sales, hence it led to a higher actual ratio of average total asset turnover. Ashok Leyland, Tata Motors and Mahindra & Mahindra are of similar age group. The actual average total assets turnover ratio of Ashok Leyland and Maruti Suzuki were marginally lower than the actual average industrial ratio. Ashok Leyland suffered due to deficient average sales and low average total assets when compared to the average industrial ratio. Though the average sales of the Maruti Suzuki were higher than the average industry, but the total assets were high when compared to the average sales of the company. The actual average total assets turnover ratio of Tata Motors was lower than the average industrial ratio. It decreased slightly over a period of 10 years. Both the average total assets and the average net sales were reportedly higher than the average industrial ratio, but when compared to the average net sales with the average total assets was higher which reflected in the low ratio of average total asset turnover. Mahindra & Mahindra recorded a lower actual ratio of the average total asset turnover when compared to the average industrial ratio. Although the average net sales and the average total assets were higher than the average industrial ratio, but, the average total assets were higher when compared to the average net sales.

4.1.4. Fixed Assets Turnover Ratio

The fixed-asset turnover ratio measures a company's ability to utilizing its fixed assets in generating revenue.

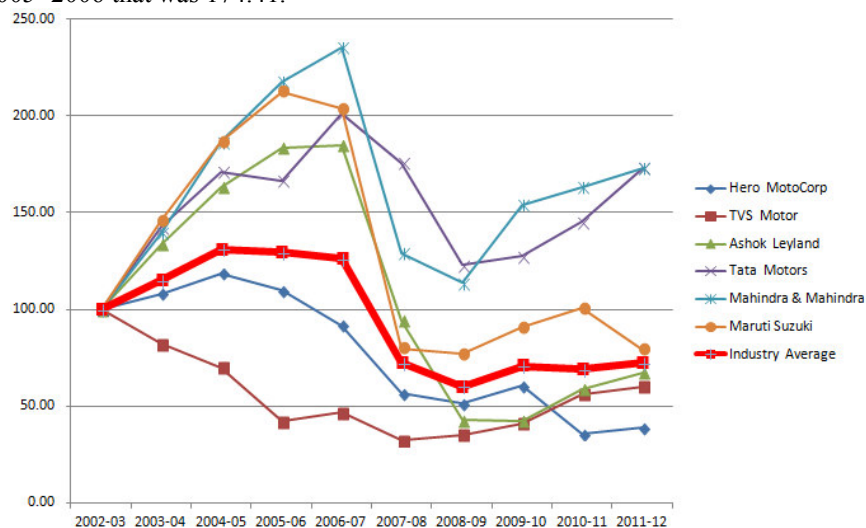
$$\text{Fixed Assets Turnover Ratio} = \frac{\text{Net Sales}}{\text{Average Net Fixed Assets}}$$

Table 1.4: Fixed Assets Turnover Ratio Chain Indices of Automobile Industries in India

Year	Hero MotoCorp		TVS Motor		Ashok Leyland		Tata Motors		Mahindra & Mahindra		Maruti Suzuki		Industry Average	
	FATR	Index	FATR	Index	FATR	Index	FATR	Index	FATR	Index	FATR	Index	FATR	Index
	2002-03	10.41	100.00	5.57	100.00	2.94	100.00	1.53	100.00	2.50	100.00	3.10	100.00	4.34
2003-04	11.23	107.88	4.58	82.23	3.93	133.67	2.18	142.48	3.49	139.60	4.53	146.13	4.99	114.93
2004-05	12.32	118.35	3.91	70.20	4.80	163.27	2.62	171.24	4.66	186.40	5.78	186.45	5.68	130.86
2005-06	11.41	109.61	2.35	42.19	5.40	183.67	2.55	166.67	5.44	217.60	6.59	212.58	5.62	129.52
2006-07	9.54	91.64	2.60	46.68	5.43	184.69	3.08	201.31	5.88	235.20	6.32	203.87	5.48	126.10
2007-08	5.89	56.58	1.80	32.32	2.77	94.22	2.69	175.82	3.22	128.80	2.48	80.00	3.14	72.36
2008-09	5.34	51.30	1.97	35.37	1.26	42.86	1.88	122.88	2.84	113.60	2.38	76.77	2.61	60.15
2009-10	6.29	60.42	2.29	41.11	1.25	42.52	1.95	127.45	3.85	154.00	2.82	90.97	3.08	70.83
2010-11	3.70	35.54	3.13	56.19	1.73	58.84	2.22	145.10	4.08	163.20	3.13	100.97	3.00	69.06
2011-12	4.05	38.90	3.34	59.96	1.98	67.35	2.65	173.20	4.32	172.80	2.46	79.35	3.13	72.17
Company Average	8.02	77.02	3.15	56.62	3.15	107.11	2.34	152.61	4.03	161.12	3.96	127.71	4.11	94.60

Sources: Computed from Annual Reports

The minimum fixed assets turnover ratio chain index in Hero MotoCorp was 35.54 in 2010-2011, TVS Motor was 32.32 in 2007-2008, Ashok Leyland was 42.52 in 2009-2010, Tata Motors was 100.00 in 2002-2003, Mahindra & Mahindra was 100.00 in 2002-2003 and Maruti Suzuki was 76.77 in 2008-2009. The maximum fixed assets turnover ratio chain index in Hero MotoCorp was 118.35 in 2004 -2005, TVS Motor was 100.00 in 2002-2003, Ashok Leyland was 184.69 in 2006-2007, Tata Motors was 201.31 in 2006-2007, Mahindra & Mahindra was 235.20 in 2006-2007 and Maruti Suzuki was 212.58 in 2005-2006. The minimum fixed assets turnover ratio chain index among selected companies was founded in Ashok Leyland in 2009-2010 that was 61.94. The maximum fixed assets turnover ratio chain index among selected companies was founded in Hero MotoCorp in 2005 -2006 that was 174.41.



Graph 1.4: Fixed Assets Turnover Ratio

The index of the fixed assets turnover ratio of Hero Motocorp has decreased to 38.90 in 2011-2012 over 2002-2003 accounting for a fall of 61.10 percent. However, there were certain alterations in the due course of 10 years, it increased slightly from 2003-2005 then decreased continuously from 2005-2007. During 2007-2008 the index of the fixed assets turnover ratio of Hero Motocorp plunged down to 35.06 percent, i.e. from 91.64 to 56.58 due to the increased value of fixed assets. Fixed assets increased enormously, Even the next year but, due to increase in sales, the index of the ratio declined by 5.28 percent. There was a slight increase in the index of the

fixed assets turnover ratio in 2009-2010 by 9.13 percent, i.e. from 51.30 to 60.42. During the year 2010-2011 the index of the ratio decreased quickly by 24.88 percent, i.e. from 60.42 to 35.54 because the company's fixed assets rose enormously, although the sales increased significantly. It increased slightly the next year. The index of the fixed assets turnover ratio of Tvs Motor decreased to 59.96 in 2011-2012 over 2002-2003 accounting for a decline of 40.04 percent, well, there were certain changes in a decade. The index of the ratio went down by 17.77 percent, i.e. from 100.00 to 82.23. It followed the next two years. Then, it increased gently in the next year by 4.49 percent. The index of the ratio decreased considerably in 2007-2008 by 14.36 percent, i.e. from 46.68 to 32.32 due to decreased sales and increased fixed assets. During the next two years the company's sales increased gradually, which in turn increased the index of the fixed assets turnover ratio gently. There was a noticeable increase in the index of the ratio by 15.08 percent, i.e. from 41.11 to 56.19 in 2010-2011 and it continued the next year. The index of the fixed assets turnover ratio of Ashok Leyland was marked by a decline to 67.35 in 2011-2012 over 2002-2003 accounting for a fall of 32.65 percent. Although, the index of the ratio altered over a period of time, it increased considerably by 33.67 percent, i.e. from 100.00 to 133.67. From 2004 to 2007 it continued to increase then, it decreased tremendously by 90.48 percent, i.e. from 184.69 to 94.22 during 2007-2008. The fixed assets increased enormously and sales decreased substantially in 2008-2009 which reflected in the dramatic decline of the index of the fixed assets turnover ratio by 51.36 percent, i.e. from 94.22 to 42.86. It continued to follow the next year. As the sales increased swiftly the index of the ratio of the company went up by 16.33 percent, i.e. from 42.52 to 58.84 in 2010-2011. It followed the next year. Tata Motors was marked by an increase in the index of the fixed assets turnover ratio to 173.20 in 2011-2012 over 2002-2003 accounting for a rise of 73.20 percent, on the other hand, there were certain changes during the 10 years. The index of the ratio rose during 2003-2004 by 42.48 percent, i.e. from 100.00 to 142.48 then, it fluctuated from 2004-2007. During the year 2007-2008 the index of the fixed assets turnover ratio of Tata Motors went down by 25.49 percent, i.e. from 201.31 to 175.82. In 2008-2009 there was a significant increase in the fixed assets and decrease in sales. Consequently the index of the ratio decreased by 52.94 percent, i.e. from 175.82 to 122.88. Later, there was an increase in the company sales, which reflected in the increased ratio by 4.58 percent. It continued the following two years. There was a rise in the index of the fixed assets turnover ratio of Mahindra & Mahindra to 172.80 in 2011-2012 over 2002-2003 accounting for an increase of 72.80 percent. Though, the index of the ratio changed over a period of 10 years, it increased by 39.60 percent, i.e. from 100.00 to 139.60 in 2003-2004. It continued from 2004-2007. Due to the increase in the value of fixed assets it decreased drastically by 106.40 percent, i.e. from 235.20 to 128.80 in 2007-2008. It continued so the next year. The index of the fixed assets turnover ratio of Mahindra & Mahindra increased steadily from 2009-2012. Maruti Suzuki's index of the fixed assets turnover ratio decreased to 79.35 in 2011-2012 over 2002-2003 accounting for a fall of 20.65 percent. Despite the fact that, there were some changes all through the decade, the index of the ratio increased by 46.13 percent, i.e. from 100.00 to 146.13 during the year 2003-2004. Then the ratio increased continuously the next two years. The index of the ratio went down in 2006-2007 by 8.71 percent. During the year 2007-2008 the fixed assets of the company increased extremely which led to the dramatic decrease of the index of the fixed assets turnover ratio by 123.87 percent, i.e. from 203.87 to 80.00. Then, it followed the next year. Gradually Maruti Suzuki increased its ratio. In 2011-2012 the index of the fixed assets turnover ratio decreased by 21.61 percent, i.e. from 100.97 to 79.35. Hero Motocorp recorded the highest actual ratio of the average fixed assets turnover ratio when compared to the actual average industrial ratio because of the lower average fixed assets when compared to the company's average sales and the ratio decreased over a period the time marginally. Tvs Motor and Ashok Leyland had the similar actual of the average fixed assets turnover ratio. Both the companies suffered due to insufficient average sales and low average fixed assets. Tata Motors was marked by the lowest actual ratio of the average fixed asset turnover. Although the company recorded higher average sales, but as the average fixed assets were comparatively more than the average sales the ratio is shown low. The actual average fixed assets turnover ratio of Mahindra & Mahindra was quieter favorable. Maruti Suzuki had a little less than the actual average fixed assets turnover ratio when compared to the actual average industry.

5. Conclusion and Recommendation

5.1. Conclusion

In the analysis of working capital management and its components six India Auto manufacturing companies have been selected. The major objective and analysis made here was the relation between working capital management and turnover ratios. In turnover ratio there were four ratios analyzed for working capital, namely the inventory turnover ratio, the debtor turnover ratio, the fixed assets turnover ratio and the total asset turnover ratio. Hero Motocorp and Maruti Suzuki have a shortage of average inventory which may lead to decline in their sales therefore the company needs to increase the average inventory. Tvs Motor was marked by poor sales performance and low inventory hence there should be improve in the sales of the company and as per the sales rose the inventory requirements to be enhanced. Ashok Leyland has major capital tied up in inventory, so the company needs to increase their sales and also reconsider their inventory. Tata Motors is

overstocked which may lead to a risk of obsolescence and increased inventory holding cost, therefore company has to reduce the inventory. Mahindra & Mahindra too is overstocked hence sales must be increased and the inventory has to be reevaluated. Hero Motocorp and Maruti Suzuki have to enhance their credit policy which would be customer friendly and lures the customers, which in turn leads to increase in the sales, whereas Ashok Leyland and Tvs Motor have to increase their sales remarkably then formulate a well designed credit policy in order to compete with the other leading automobile companies. Mahindra & Mahindra and Tata Motors are required to re-assess their credit policy and follow proper time limit in the collection of the credit.

Hero Motocorp seems to be operating beyond its capacity so it requirements to increase its fixed assets. Tvs Motor and Ashok Leyland need to enhance their average sales and as per the enhancement of average sales the fixed assets require to be increased. Tata Motors has over- invested in fixed assets, therefore it needs to sell its excess fixed assets. Mahindra & Mahindra made large investments in fixed assets which do not increase the capacity of bottleneck operation, thus the company has to upgrade its fixed assets. Maruti Suzuki is running at full capacity, hence it requires further investments in fixed assets.

5.2. Recommendation

There should be increased in the total asset value of Hero Motocorp and Maruti Suzuki along with the increase of sales in Hero Motocorp. Ashok Leyland and Tvs Motor need to increase their sales and as per the ratio of increased in sales the total asset value should also increase. Tata Motor is suggested re-invest in their total assets. There should be an improvement in the sales of Mahindra & Mahindra and accordingly to the ratio of sales the company the total assets should be re-invest.

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