# EFFICIENT MANAGEMENT OF WORKING CAPITAL IN STEEL COMPANIES OF INDIA

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**ABSTRACT**

Liquidity and profitability are the importance aspects in a business. Liquidity depends on the profitability of business activities and profitability is hard to achieve without satisfactory liquid resources. Both are closely inter-related. Working capital is the tepid blood passing through the arteries and veins of the business and sets it ticking. Working capital in a going concern is a gyratory fund, it consists of cash receipts form sales which are used to cover the cost of current operations. One hypotheses has been used in this study that is based on Chi-square test is to understand working capital direction and growth/efficiency. The statement of null hypothesis is, "The working capital indices of the sample units can be represented by the straight line trend based on the least square method. The acceptance of the said hypothesis would reveal that the working capital indices of the sample units cannot be represented by the straight line trend based on the least square method.

**KEYWORDS:** Working Capital**,** Indian steel companies, Liquidity, Profitability, Trend Values

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## INTRODUCTION

Working capital is the lifeblood of a business. Good working capital management can take a business towards success whereas inefficient working capital management can move the business to downfall. An optimum working capital management is expected to contribute positively to the creation of firm's value. Working capital is of crucial importance in case of capacity utilization and consumption of steels Working capital is the cash available for day to day operations of a business and meets its obligations. Good working capital management will secure a company's financial stature and help build its business. It is necessary for increasing earnings and makes it easier to get business loans and attract potential investors. The main aim of a working capital management plan is to balance current assets against liabilities. This helps companies maintain its planned expenses like salaries and short term financial obligations. If a company's current liabilities are more than its current assets, it signifies a negative working capital. Hiring a good accounts manager who knows various techniques will take care of working capital management in a business efficiently. In case of deficiency, the company can increase the working capital with proper management of outstanding incomes, its creditors and of the company's inventory or by getting a short term loan. The company's growth rate can be increased with cash by regulating its investment plans and by handling profit efficiently. It is important to having good working capital management in order to identify the right time to convert the company's current assets into cash. This is called the cash conversion period. Working capital management always ensures sufficient cash flow in a business. This allows companies to pay their liabilities without delay and more importantly protects them bankruptcy.

Therefore, working capital should neither too high nor too low. Excessive working capital indicates an accumulation of idle current assets (resources) which don't contribute in generating income (profit) for the firm during the operating period. On the other side, inadequate working capital harms the credit worthiness and the day to day activities of firms and this may lead to insolvency (bankruptcy).

Steel is vital to the development of any modern economy and is considered to be the backbone of the human civilization. It is a product of a large and technologically complex industry having strong forward and backward linkages in terms of material flow and income generation. All major industrial economies are characterized by the subsistence of a strong steel industry and the growth of many of these economies has been largely shaped by the strength of their steel industries in their initial stages of development.

At present, India is among the top producers of all the forms of steel in the world .Easy accessibility of low cost manpower and preferences of plentiful referrers make India completive in the global setup. India occupies 4TH rank in world's in the year 2012 in the crude steel production i.e. 77.6 million tons, while china is the world largest crude steel producer producing 716.5 million tons of crude steel. India per capita steel consumption is 56.9 kg as compared to world average consumption of 216.9 kg so this level of per capita consumption of steel is treated as one of the important indicators of socio-economic development and living standard of the people in any country because of large consumption of steels.

The future, selective steel producers in India is very high making it prone to increasing returns to scale and the consequent market structure. TISCO, public sector entities, POSCO, Jindal, Essar, and Arcelor-Mittal will be among the major players accounting for the bulk of the 100 plus million tonnes of production.

**LITERATURE REVIEW**

To propose and defend the research work, a number of research papers are analysed. Following are the excerpts from the different research work performed by number of academicians and researchers.

**Nimalathasan Balasundaram (2003)** stated the impact of working capital management on profitability and by reducing the number of day's inventory and accounts receivables one can increase the profitability.

**Lazaridis et al (2006)** investigated the relationship between profitability and working capital management in Athens Stock market Exchange (ASE) using a sample of 131 firms for the period from 2001 to 2004. Their findings showed that cash conversion cycle connected with gross profit margin negativity.

**Raheman Abdul et al (2007)** affirmed the effect of Working Capital Management on liquidity as well on profitability of the firm. They had taken a sample of 94 Pakistani firms which were listed on Karachi Stock Exchange for 6 years of period from 1999 – 2004, they had taken into consideration various variables of working capital management like the Average collection period, Inventory turnover in days, Average payment period, Cash conversion cycle and Current ratio on the Net operating profitability of Pakistani firms. Pearson's correlation and regression analysis were used for analysis. The results revealed that there was a study negative relationship between variables of the working capital management and profitability of the firm. They initiate that there was a significant negative relationship between liquidity and profitability. They also found that there was a positive

relationship between size of the firm and its profitability. There was also a significant negative relationship between debt used by the firm and its profitability.

**Nazir et al (2009)**. The sample consisted of 204 non-financial firms active in Karachi Stock Exchange (KSE) over the period from 1998 to 2005. Their result showed that the rate of assertiveness in working capital polices and financing measures were negatively associated with both profitability ratios including return on assets and Tobin's q.  More aggressive policies should be followed in managing current liabilities.

**Dănuleţiue Adina Elena (2010),** the principle of this study was to analyze the efficiency of working capital management of companies from Alba County. The conclusion to the study was that there was a weak linear correlation between working capital management indicators and profitability rates.

**Singh Karamjeet (2010)** stated that working capital management should be well designed and it had a momentous contribution for firms' profitability so as to maintain the liquidity powers. The rationale of this study was to investigate the liaison between profitability and liquidity of firms. Therefore, the working capital should neither too high nor too low. Excessive working capital indicates a gathering of idle current assets (resources) which didn't contribute in generating income (profit) for the firm during the operating period. On the other side, inadequate working capital troubles the credit worthiness and the day to day activities of firms and this might lead to insolvency (bankruptcy).

**Mumtaaz Adeel et al (2010)** in the paper they analyzed how working capital management impact's the firm's performance in the market which was progressive in nature such as Karachi stock exchange. He took a sample of 22 firms of the chemical sector for 6 years i.e. from 2005-2010.He utilized diverse variables for the analysis of working capital management and firm performance. Various control variables were used in the study i.e. number of day's receivables, number of day's inventory and the Size, Leverage, Inventories, Equity, Sales, and GDP. The dependent variable that was used in the study to measure the performance was Return on Asset. The firm's profitability was greater affected by the size of the firm. The higher profit firms were not interested in managing working capital and firm performance. The result of the study concluded that there was a negative relationship between the working capital and firm performance. The relationship between the size and profitability was positive. If the size of the firm was increased or decreased then the profitability increased or decreased respectively and concluded that there was a negative relationship between the profitability and the debt utilized by firms that support to pecking order theory.

**Tahmina Quayyum Sayeda (2011)** in this paper she investigated how the profitability of corporations can be affected with working capital management efficiency as well as maintaining

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liquidity. Corporations enlisted with Dhaka Stock Exchange (cement industry) had been selected this covered a time period from year 2005 to 2009. The purpose of this paper was to explain the prerequisite of firms optimizing their level of working capital management and maintaining enough liquidity as it affects the profitability. The outcome of this study clearly showed a significant level of relationship between the profitability indices and various liquidity indices as well as working capital components. This study found a negative relationship between cash conversion cycle and profitability of the Firm.

**2Alipour Mohammad, (2011)** avowed that the vital measuring tool to evaluate the efficiency of working capital management was cash conversion cycle. After that multiple regression and Pearson's correlation was used to test the hypothesis. The outcome of the research showed that there was a significant relation between working capital management and profitability and working capital management had an enormous effect on the profitability of the companies and the managers could generate value for shareholders by means of decreasing receivable accounts and inventory.

**Niresh J. Aloy (2012)** declared that central element in determining the financial performance of an organization was working capital management. The conclusions divulge that, there was no significant relationship between cash conversion cycle and performance measures. The study also concluded that manufacturing firms in Sri Lanka should follow conservative working capital management policy.

**Malik Zafar Ullah (2012)** study showed that the impact of working capital management on firm's profitability in sugar industry of Pakistan for years 1999 to 2009. To analyze this, data of 19 sugar mills which are listed at Karachi Stock Exchange was used. The result showed that the Sales Growth, Current Ratio, No of Days Inventory and No of Days Accounts Payables are appreciably affecting the profitability of the firms while Sales, Gearing Ratio and No. of Days Account Receivables are of no consequence in the research.

**Desai Hiral et al (2015)** studied that one can only survive with efficient working capital. It is the life blood of any business. It is the challenging aspect of the financial management. The rationale behind the study was to investigate the impact of working capital management on profitability, liquidity & risk on the Dabur India & Maric. Various statistical tools like average, Spearman's coefficient of correlation and accounting technique such as ratio were used. Further it revealed that there was a negative relationship between liquidity and profitability and a positive relationship between profitability and risk.

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## OBJECTIVES OF STUDY

The purpose of the research is to discover answers of the following question through the application on scientific procedures. The main objective of the research is to understand the liquidity management of steel units as well the problems in liquidity management of these units. This broader objective is classified into:

- To know the tendency of raw material of the selected units.
- To know credit tendency of the selected units.

## PERIOD OF STUDY

This study is based on secondary data taken from published annual reports of the sample units for the period from 2007-2016, various reports of Ministry of steel of India and relevant publications were taken into consideration. Most of the work is based on annual reports.

## DATA COLLECTION AND ANALYSIS

Information used for the analysis of financial liquidity of steel industry of India is availed from the annual reports presented at the end of every accounting year. Annual accounting reports of the units under study are important. Thus, the research is particularly based on secondary data.

## ANALYSIS AND INTERPRETATION OF DATA

One hypotheses has been used in this study that is based on Chi-square test is to understand working capital direction and growth/efficiency. The statement of null hypothesis is, "The working capital indices of the sample units can be represented by the straight line trend based on the least square method". The acceptance of the said hypothesis would reveal that the working capital indices of the sample units cannot be represented by the straight line trend based on the least square method.

**The table no.1** shows the arithmetical picture about Inventory turnover ratio, Inventory turnover ratio index and trend value of JSW Steel Ltd .from the period 2007-2016 i.e. ten years of research period. It also computes and gives the chi-square value, standard deviation and co-efficient of variation for the same. The Inventory turnover ratio comes out to be 6.9 for the base year and thereafter increases and then decreases for two years. So, after screening the above figures, it can be said that the Sales-Inventory ratio stays in a mixed trend. Then, Sales- Inventory turnover ratio index is supposed to 100 for the base year i.e.2007.Sales-Inventory turnover ratio index states the arithmetical information about the disparity in Sales-Inventory turnover ratio.

At this time, the calculated value of chi-square is 11.22. On the other hand, the critical value of chi-square is 15.5.Hence; the critical value is higher than the calculated value. It indicates that the null hypothesis is accepted and the alternative hypothesis is rejected. It means, **"There is no significant**

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**difference in Inventory turnover ratio of the company".** On the other hand, the standard deviation comes out to 11.14 while the coefficient of variation is 11.29. So, it can be stated that there is little deviation in the productive index.

**Table 1: Inventory turnover ratio of JSW Steel Ltd**

| Year | ITR | INDEX | TREND VALUES | CHI SQUARE VALUE | STANDARD DEVIATION |
|------|------|--------|--------------|------------------|---------------------|
| 2007 | 6.9 | 100 | 104.613 | 0.203 | 1.88 |
| 2008 | 6.98 | 101.15 | 103.283 | 0.044 | 6.36 |
| 2009 | 7.4 | 107.23 | 101.953 | 0.273 | 73.99 |
| 2010 | 6.63 | 96.07 | 100.623 | 0.206 | 6.54 |
| 2011 | 6.06 | 87.81 | 99.293 | 1.327 | 117.0 |
| 2012 | 8.1 | 117.36 | 97.963 | 3.840 | 350.88 |
| 2013 | 7.91 | 115.33 | 96.633 | 3.617 | 278.95 |
| 2014 | 5.87 | 85.04 | 95.303 | 1.105 | 184.63 |
| 2015 | 6.08 | 87.35 | 93.973 | 0.466 | 127.19 |
| 2016 | 6.14 | 88.94 | 92.643 | 0.148 | 93.85 |
| TOTAL | 68.07 | 986.28 | 986.28 | 11.22 | 1241.27 |
| AVERAGE | 6.807 | 98.628 | 98.628 | 1.122 | 124.127 |

Chi Squ: 11.22, SD: 11.14, CV: 11.29

**The table no.2** shows the arithmetical picture about Inventory turnover ratio, Inventory turnover ratio index and trend value of Tata Steel Ltd .from the period 2007-2016 i.e. ten years of research period. It also computes and gives the chi-square value, standard deviation and co-efficient of variation for the same. The Inventory turnover ratio comes out to be 4.68 for the base year. So, after screening the above figures, it can be said that the Sales-Inventory ratio stays in a mixed trend. Then, Sales- Inventory turnover ratio index is supposed to 100 for the base year i.e.2007.Sales-Inventory turnover ratio index states the arithmetical information about the disparity in Sales-Inventory turnover ratio.

At this time, the calculated value of chi-square is 78.3. On the other hand, the critical value of chi-square is 15.5.Hence; the critical value is lower than the calculated value. It indicates that the null hypothesis is rejected and the alternative hypothesis is accepted. It means, **"There is a significant difference in Inventory turnover ratio of the company".** On the other hand, the standard deviation comes out to 26.01 while the coefficient of variation is 20.18. So, it can be stated that there is deviation in the productive index.

**Table 2: Inventory turnover ratio of Tata Steel Ltd**

| Year | ITR | INDEX | TREND VALUES | CHI SQUARE VALUE | STANDARD DEVIATION |
|------|------|---------|---------|-------|---------|
| 2007 | 4.68 | 100 | 104.227 | 0.17 | 834.45 |
| 2008 | 4.79 | 102.35 | 109.707 | 49.33 | 704.21 |
| 2009 | 5.29 | 113.03 | 115.187 | 0.04 | 251.44 |
| 2010 | 5.12 | 109.39 | 120.667 | 1.05 | 380.13 |
| 2011 | 5.25 | 112.16 | 126.147 | 1.55 | 279.79 |
| 2012 | 7.62 | 162.79 | 134.627 | 5.89 | 1149.41 |
| 2013 | 8.05 | 171.97 | 137.107 | 8.86 | 1856.14 |
| 2014 | 7.71 | 164.70 | 142.587 | 3.42 | 1282.57 |
| 2015 | 5.79 | 123.68 | 148.067 | 4.01 | 27.11 |
| 2016 | 6.03 | 128.80 | 153.547 | 3.98 | 0.007 |
| TOTAL | 60.33 | 1288.87 | 1288.87 | 78.3 | 6765.25 |
| AVERAGE | 6.033 | 128.887 | 128.887 | 7.83 | 676.52 |

Chi Squ: 78.3, SD: 26.01, CV: 20.18

**The table no.3** shows the arithmetical picture about Inventory turnover ratio, Inventory turnover ratio index and trend value of JINDAL .from the period 2007-2016 i.e. ten years of research period. It also computes and gives the chi-square value, standard deviation and co-efficient of variation for the same. The inventory turnover ratio comes out to be 3.81 for the base year. So, after screening the above figures, it can be said that the Sales-Inventory ratio stays in a mixed trend. Then, Sales-Inventory turnover ratio index is supposed to 100 for the base year i.e. 2007.Sales-Inventory turnover ratio index states the arithmetical information about the disparity in Sales-Inventory turnover ratio.

At this time, the calculated value of chi-square is 640.99. On the other hand, the critical value of chi-square is 15.5.Hence; the critical value is lower than the calculated value. It indicates that the null hypothesis is rejected and the alternative hypothesis is accepted. It means, **"There is a significant difference in Inventory turnover ratio of the company".** On the other hand, the standard deviation comes out to 11.80 while the coefficient of variation is 13.22. So, it can be stated that there is marginal deviation in the productive index.

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**Table 3: Inventory turnover ratio of SAIL**

| Year | ITR | INDEX | TREND VALUES | CHI SQUARE VALUE | STANDARD DEVIATION |
|------|-----|-------|--------------|------------------|--------------------|
| 2007 | 3.81 | 100 | -45.69 | -464.55 | 116.20 |
| 2008 | 4.15 | 108.92 | -15.71 | -988.71 | 388.09 |
| 2009 | 3.98 | 104.45 | 14.27 | 569.89 | 231.95 |
| 2010 | 3.18 | 83.45 | 44.25 | 34.72 | 33.29 |
| 2011 | 3.49 | 91.58 | 74.23 | 4.05 | 5.56 |
| 2012 | 3.37 | 88.43 | 104.21 | 2.38 | 0.62 |
| 2013 | 2.79 | 73.21 | 134.19 | 27.71 | 256.32 |
| 2014 | 3.45 | 90.52 | 164.17 | 3.30 | 1.69 |
| 2015 | 2.88 | 75.56 | 194.15 | 72.43 | 186.59 |
| 2016 | 2.9 | 76.08 | 224.13 | 97.79 | 172.65 |
| TOTAL | 34.0 | 892.2 | 892.2 | 640.99 | 1392.96 |
| AVERAGE | 3.40 | 89.22 | 89.22 | 64.099 | 139.296 |

Chi Squ: 640.99, SD: 11.80, CV: 13.22

**The table no.4** shows the arithmetical picture about Inventory turnover ratio, Inventory turnover ratio index and trend value of JINDAL .from the period 2007-2016 i.e. ten years of research period. It also computes and gives the chi-square value, standard deviation and co-efficient of variation for the same. The inventory turnover ratio comes out to be 7.2 for the base year. So, after screening the above figures, it can be said that the Sales-Inventory ratio stays in a mixed trend. Then, Sales-Inventory turnover ratio index is supposed to 100 for the base year i.e.2007. Sales-Inventory turnover ratio index states the arithmetical information about the disparity in Sales-Inventory turnover ratio.

At this time, the calculated value of chi-square is 21.36. On the other hand, the critical value of chi-square is 15.5.Hence; the critical value is lower than the calculated value. It indicates that the null hypothesis is rejected and the alternative hypothesis is accepted. It means, **"There is a significant difference in Inventory turnover ratio of the company".** On the other hand, the standard deviation comes out to 20.99 while the coefficient of variation is 25.47. So, it can be stated that there is a little deviation in the productive index.

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### Table 4: Inventory turnover ratio of JINDAL

| Year | ITR | INDEX | TREND VALUES | CHI SQUARE VALUE | STANDARD DEVIATION |
|------|------|--------|--------------|------------------|--------------------|
| 2007 | 7.2 | 100 | 113.59 | 1.62 | 309.58 |
| 2008 | 8.3 | 115.27 | 106.66 | 0.69 | 1080.10 |
| 2009 | 8.2 | 113.88 | 99.73 | 2.00 | 99.7 |
| 2010 | 6.8 | 94.37 | 92.8 | 0.02 | 143.16 |
| 2011 | 6.9 | 95.75 | 85.87 | 1.13 | 178.08 |
| 2012 | 4.37 | 60.64 | 78.94 | 4.24 | 473.71 |
| 2013 | 4.16 | 57.72 | 72.01 | 2.83 | 609.34 |
| 2014 | 4.15 | 57.58 | 65.08 | 0.86 | 616.28 |
| 2015 | 3.94 | 54.66 | 58.15 | 0.21 | 769.78 |
| 2016 | 5.13 | 71.16 | 51.22 | 7.76 | 126.45 |
| TOTAL | 59.15 | 824.05 | 824.05 | 21.36 | 4406.18 |
| AVERAGE | 5.915 | 82.405 | 82.405 | 2.136 | 440.618 |

Chi Squ: 21.36, SD: 20.99, CV: 25.47

**The table no.5** shows the arithmetical picture about Inventory turnover ratio, Inventory turnover ratio index and trend value of STEEL EXCHANGE OF INDIA .from the period 2007-2016 i.e. ten years of research period. It also computes and gives the chi-square value, standard deviation and co-efficient of variation for the same. The inventory turnover ratio comes out to be 4.86 for the base year. So, after screening the above figures, it can be said that the Sales-Inventory ratio stays in a mixed trend. Then, Sales- Inventory turnover ratio index is supposed to 100 for the base year i.e.2007.Sales-Inventory turnover ratio index states the arithmetical information about the disparity in Sales-Inventory turnover ratio.

At this time, the calculated value of chi-square is 127.37. On the other hand, the critical value of chi-square is 15.5.Hence; the critical value is lower than the calculated value. It indicates that the null hypothesis is rejected and the alternative hypothesis is accepted. It means, **"There is a significant difference in Inventory turnover ratio of the company".** On the other hand, the standard deviation comes out to 21.03 while the coefficient of variation is 35.86. So, it can be stated that there is deviation in the productive index.

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**Table 5: Inventory turnover ratio of STEEL EXCHANGE OF INDIA**

| Year | ITR | INDEX | TREND VALUES | CHI SQUARE VALUE | STANDARD DEVIATION |
|------|-----|-------|--------------|------------------|--------------------|
| 2007 | 4.86 | 100 | 71.3667 | 11.48 | 1711.33 |
| 2008 | 2.35 | 48.35 | 68.5367 | 5.94 | 105.71 |
| 2009 | 2.3 | 47.32 | 65.7067 | 5.14 | 127.95 |
| 2010 | 2.86 | 58.84 | 62.8767 | 0.25 | 0.04 |
| 2011 | 2.15 | 44.23 | 60.0467 | 4.16 | 207.40 |
| 2012 | 4.86 | 99.98 | 57.2167 | 31.96 | 1709.68 |
| 2013 | 2.35 | 48.34 | 54.3867 | 67.22 | 105.91 |
| 2014 | 2.14 | 44.02 | 51.5567 | 1.10 | 213.50 |
| 2015 | 2.3 | 47.31 | 48.727 | 0.04 | 128.18 |
| 2016 | 2.33 | 47.927 | 45.8967 | 0.08 | 114.59 |
| TOTAL | 28.5 | 586.317 | 586.317 | 127.37 | 4424.29 |
| AVERAGE | 2.85 | 58.6317 | 58.6317 | 12.737 | 442.429 |

Chi Squ: 127.37, SD: 21.03, CV: 35.86

**The table no.6** shows the arithmetical picture about Debtors Turnover ratio, Debtors turnover ratio index and trend value of JSW Steel Ltd .from the period 2007-2016 i.e. ten years of research period. It also computes and gives the chi-square value, standard deviation and co-efficient of variation for the same. The debtor turnover ratio comes out to be 0.95 for the base year and thereafter increases after three years and afterwards decreases after three years and then increases continuously. So, after screening the above figures, it can be said that the Sales-Debtors ratio stays in a mixed trend. Then, Sales- Debtors Turnover ratio index is supposed to 100 for the base year i.e.2007.Sales-Debtors turnover ratio index states the arithmetical information about the disparity in Sales-Debtors Turnover ratio.

At this time, the calculated value of chi-square is 168.86. On the other hand, the critical value of chi-square is 15.5.Hence; the critical value is lower than the calculated value. It indicates that the null hypothesis is rejected and the alternative hypothesis is accepted. It means, **"There is a significant difference in Debtors turnover ratio of the company".** On the other hand, the standard deviation comes out to 31.63 while the coefficient of variation is 26.29. So, it can be stated that there is much difference in the productive index.

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**Table 6: Debtors turnover ratio of JSW Steel Ltd**

| Year | DTR | INDEX | TREND VALUES | CHI SQUARE VALUE | STANDARD DEVIATION |
|---|---|---|---|---|---|
| 2007 | 0.95 | 100 | 105.088 | 0.24 | 412.00 |
| 2008 | 1.68 | 176.84 | 102.748 | 53.42 | 3196.99 |
| 2009 | 1.21 | 127.36 | 100.408 | 7.23 | 49.87 |
| 2010 | 1.62 | 170.51 | 98.068 | 53.51 | 2521.24 |
| 2011 | 0.76 | 79.99 | 95.728 | 2.58 | 1624.73 |
| 2012 | 0.79 | 83.14 | 93.388 | 1.12 | 1380.71 |
| 2013 | 0.92 | 96.82 | 91.048 | 0.36 | 551.21 |
| 2014 | 1.05 | 110.50 | 88.703 | 5.35 | 96.00 |
| 2015 | 1.27 | 133.65 | 86.368 | 25.88 | 160.52 |
| 2016 | 1.18 | 124.17 | 84.028 | 19.17 | 14.99 |
| TOTAL | 11.43 | 1202.98 | 945.575 | 168.86 | 10008.26 |
| AVERAGE | 1.143 | 120.298 | 94.55 | 16.886 | 1000.826 |

Chi Squ: 168.86, SD: 31.63, CV: 26.29

**The table no.7** shows the arithmetical picture about Debtors Turnover ratio, Debtors turnover ratio index and trend value of Tata Steel Ltd .from the period 2007-2016 i.e. ten years of research period. It also computes and gives the chi-square value, standard deviation and co-efficient of variation for the same. The debtor turnover ratio comes out to be 0.62 for the base year and thereafter decreases after two years and afterwards increases in the year 2010 after two years it shows a declining trend and in the year 2013 the ratio is increased and afterwards it shows a declining trend. So, after screening the above figures, it can be said that the Sales-Debtors ratio stays in a mixed trend. Then, Sales- Debtors Turnover ratio index is supposed to 100 for the base year i.e.2007. Sales-Debtors turnover ratio index states the arithmetical information about the disparity in Sales-Debtors Turnover ratio.

At this time, the calculated value of chi-square is 3.6044. On the other hand, the critical value of chi-square is 15.5.Hence; the critical value is higher than the calculated value. It indicates that the null hypothesis is accepted and the alternative hypothesis is rejected. It means, **"There is no significant difference in Debtors turnover ratio of the company".** On the other hand, the standard deviation comes out to 14.149 while the coefficient of variation is 18.09. So, it can be stated that there is no such deviation in the productive index.

**Table 7: Debtors turnover ratio of Tata Steel Ltd**

| Year | DTR | INDEX | TREND VALUES | CHI SQUARE VALUE | STANDARD DEVIATION |
|------|-----|-------|--------------|------------------|---------------------|
| 2007 | 0.62 | 100 | 98.544 | 0.02 | 475.06 |
| 2008 | 0.58 | 93.54 | 94.024 | 0.002 | 235.19 |
| 2009 | 0.52 | 83.86 | 89.504 | 0.35 | 31.99 |
| 2010 | 0.61 | 98.37 | 84.984 | 2.10 | 406.66 |
| 2011 | 0.45 | 72.56 | 80.464 | 0.7 | 31.85 |
| 2012 | 0.44 | 70.94 | 75.944 | 0.32 | 52.76 |
| 2013 | 0.46 | 74.16 | 71.424 | 0.10 | 16.35 |
| 2014 | 0.42 | 67.71 | 66.904 | 0.009 | 110.12 |
| 2015 | 0.39 | 62.87 | 62.384 | 0.003 | 235.13 |
| 2016 | 0.36 | 58.03 | 57.864 | 0.0004 | 406.99 |
| TOTAL | 4.85 | 782.04 | 782.04 | 3.6044 | 2002.1 |
| AVERAGE | 0.485 | 78.204 | 78.204 | 0.36044 | 200.21 |

Chi Squ: 3.6044, SD: 14.149, CV: 18.09

**The table no.8** shows the arithmetical picture about Debtors Turnover ratio, Debtors turnover ratio index and trend value of JINDAL .from the period 2007-2016 i.e. ten years of research period. It also computes and gives the chi-square value, standard deviation and co-efficient of variation for the same. The debtor turnover ratio comes out to be 0.50 for the base year and thereafter increases after three years and afterwards decreases for two years and then increases in the year 2013 and then decreases in the year 2014 and then increases. So, after screening the above figures, it can be said that the Sales-Debtors ratio stays in a mixed trend. Then, Sales- Debtors Turnover ratio index is supposed to 100 for the base year i.e.2007.Sales-Debtors turnover ratio index states the arithmetical information about the disparity in Sales-Debtors Turnover ratio.

At this time, the calculated value of chi-square is 154.16. On the other hand, the critical value of chi-square is 15.5.Hence; the critical value is lower than the calculated value. It indicates that the null hypothesis is rejected and the alternative hypothesis is accepted. It means, **"There is a significant difference in Debtors turnover ratio of the company".** On the other hand, the standard deviation comes out to 46.21 while the coefficient of variation is 43.67. So, it can be stated that there is deviation in the productive index.

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**Table 8: Debtors turnover ratio of SAIL**

| Year | DTR | INDEX | TREND VALUES | CHI SQUARE VALUE | STANDARD DEVIATION |
|------|------|-------|--------------|------------------|---------------------|
| 2007 | 0.50 | 100 | 147.065 | 15.06 | 33.64 |
| 2008 | 0.60 | 120 | 137.895 | 2.32 | 201.64 |
| 2009 | 0.78 | 156 | 128.725 | 5.77 | 2520.04 |
| 2010 | 0.92 | 184 | 119.555 | 34.73 | 6115.24 |
| 2011 | 0.85 | 170 | 110.985 | 32.19 | 4121.64 |
| 2012 | 0.29 | 58 | 101.215 | 18.45 | 2284.84 |
| 2013 | 0.32 | 64 | 92.045 | 8.54 | 1747.24 |
| 2014 | 0.31 | 62 | 82.875 | 5.25 | 1918.44 |
| 2015 | 0.32 | 64 | 73.705 | 1.27 | 1747.24 |
| 2016 | 0.40 | 80 | 147.065 | 30.58 | 665.64 |
| TOTAL | 5.29 | 1058 | 1140.53 | 154.16 | 21355.6 |
| AVERAGE | 0.529 | 105.8 | 114.053 | 15.416 | 2135.56 |

Chi Squ: 154.16, SD: 46.21, CV: 43.67

**The table no.9** shows the arithmetical picture about Debtors Turnover ratio, Debtors turnover ratio index and trend value of JINDAL .from the period 2007-2016 i.e. ten years of research period. It also computes and gives the chi-square value, standard deviation and co-efficient of variation for the same. The debtor turnover ratio comes out to be 2.93 for the base year and thereafter decreases for two years and increases in the year 2010 and thereafter decreases for two years and afterwards it shows a rising trend and then decreases in 2015 and thereafter increases in the year 2016. So, after screening the above figures, it can be said that the Sales-Debtors ratio stays in a mixed trend. Then, Sales- Debtors Turnover ratio index is supposed to 100 for the base year i.e.2007.Sales-Debtors turnover ratio index states the arithmetical information about the disparity in Sales-Debtors Turnover ratio.

At this time, the calculated value of chi-square is 194.241. On the other hand, the critical value of chi-square is 15.5.Hence; the critical value is lower than the calculated value. It indicates that the null hypothesis is rejected and the alternative hypothesis is accepted. It means, **"There is a significant difference in Debtors turnover ratio of the company".** On the other hand, the standard

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deviation comes out to 21.92 while the coefficient of variation is 34.93. So, it can be stated that there is no much deviation in the productive index.

**Table 9: Debtors turnover ratio of JINDAL**

| Year | DTR | INDEX | TREND VALUES | CHI SQUARE VALUE | STANDARD DEVIATION |
|---|---|---|---|---|---|
| 2007 | 2.93 | 100 | 55.051 | 36.70 | 1387.86 |
| 2008 | 1.63 | 55.63 | 49.921 | 0.65 | 50.63 |
| 2009 | 1.56 | 53.24 | 48.211 | 0.52 | 90.36 |
| 2010 | 2.83 | 96.58 | 46.501 | 53.93 | 1144.73 |
| 2011 | 0.92 | 31.39 | 44.791 | 44.791 | 983.19 |
| 2012 | 0.86 | 29.34 | 43.081 | 4.38 | 1115.96 |
| 2013 | 1.92 | 65.50 | 41.371 | 14.07 | 7.58 |
| 2014 | 1.96 | 66.86 | 39.661 | 18.65 | 16.92 |
| 2015 | 1.85 | 63.10 | 37.951 | 16.66 | 0.12 |
| 2016 | 1.93 | 65.82 | 51.631 | 3.89 | 9.44 |
| TOTAL | 18.39 | 627.46 | 458.17 | 194.241 | 4806.79 |
| AVERAGE | 1.839 | 62.746 | 45.817 | 19.4241 | 480.679 |

Chi Squ: 194.241, SD: 21.92, CV: 34.94

**The table no.10** shows the arithmetical picture about Debtors Turnover ratio, Debtors turnover ratio index and trend value of STEEL EXCHANGE OF INDIA .from the period 2007-2016 i.e. ten years of research period. It also computes and gives the chi-square value, standard deviation and co-efficient of variation for the same. The debtor turnover ratio comes out to be 6.86 and thereafter decreases in the year 2008 (5.82) and increases in the year 2009 and then again decreases in 2010 and then it shows a mixed trend.. Then, Sales- Debtors Turnover ratio index is supposed to 100 for the base year i.e.2007.Sales-Debtors turnover ratio index states the arithmetical information about the disparity in Sales-Debtors Turnover ratio

At this time, the calculated value of chi-square is 152.85. On the other hand, the critical value of chi-square is 15.5.Hence; the critical value is lower than the calculated value. It indicates that the null hypothesis is rejected and the alternative hypothesis is accepted. It means, **"There is a significant difference in Debtors turnover ratio of the company".** On the other hand, the standard deviation

comes out to 20.17 while the coefficient of variation is 21.72. So, it can be stated that there is no so much deviation in the productive index.

**Table 10: Debtors turnover ratio of STEEL EXCHANGE OF INDIA**

| Year | DTR | INDEX | TREND VALUES | CHI SQUARE VALUE | STANDARD DEVIATION |
|------|-----|-------|--------------|------------------|--------------------|
| 2007 | 6.86 | 100 | 48.920 | 53.33 | 51.07 |
| 2008 | 5.82 | 84.83 | 58.684 | 11.64 | 64.36 |
| 2009 | 6.21 | 90.51 | 68.448 | 7.11 | 5.489 |
| 2010 | 3.86 | 56.25 | 78.212 | 6.16 | 1339.7 |
| 2011 | 9.25 | 134.79 | 87.976 | 24.91 | 1758.71 |
| 2012 | 7.87 | 114.68 | 97.74 | 2.93 | 476.41 |
| 2013 | 6.75 | 98.35 | 107.504 | 0.77 | 30.21 |
| 2014 | 5.29 | 77.07 | 117.268 | 13.77 | 249.10 |
| 2015 | 6.00 | 87.41 | 127.032 | 12.35 | 29.62 |
| 2016 | 5.81 | 84.64 | 136.796 | 19.88 | 67.45 |
| TOTAL | 63.72 | 928.53 | 928.58 | 152.85 | 4072.119 |
| AVERAGE | 6.372 | 92.853 | 92.858 | 15.285 | 407.2119 |

Chi Squ: 152.85, SD: 20.17, CV: 21.72

**CONCLUSION**

In this research paper, five steel companies had been selected to study the working capital management. To know about the tendency of raw material of the selected units Inventory Turnover Ratio has been used .To know credit tendency of the selected units Debtors turnover ratio has been used. One hypotheses has been used in this study that is based on Chi-square test is to understand working capital direction and growth/efficiency. The statement of null hypothesis is, "The working capital indices of the sample units can be represented by the straight line trend based on the least square method". The acceptance of the said hypothesis would reveal that the working capital indices of the sample units cannot be represented by the straight line trend based on the least square method. In case of Inventory Turnover Ratio of **JSW Steel**, the calculated value of chi-square is 11.22.

On the other hand, the critical value of chi-square is 15.5.Hence; the critical value is higher than the calculated value. It indicates that the null hypothesis is accepted and the alternative hypothesis is rejected. It means, "There is no significant difference in Inventory turnover ratio of the company". In case of Inventory Turnover Ratio of **Tata Steel** "There is a significant difference in Inventory turnover ratio of the company". In case of Inventory Turnover Ratio of **SAIL** "There is a significant difference in Inventory turnover ratio of the company". In case of Inventory Turnover Ratio of **JINDAL** "There is a significant difference in Inventory turnover ratio of the company". In case of Inventory Turnover Ratio of **STEEL EXCHANGE OF INDIA** "There is a significant difference in Inventory turnover ratio of the company". In case of Debtor Turnover Ratio of **JSW Steel** the calculated value of chi-square is 168.86. On the other hand, the critical value of chi-square is 15.5.Hence; the critical value is lower than the calculated value. It indicates that the null hypothesis is rejected and the alternative hypothesis is accepted. It means, **"There is a significant difference in Debtors turnover ratio of the company".** In case of Debtor Turnover Ratio of **Tata Steel** "There is no significant difference in Inventory turnover ratio of the company". In case of Debtor Turnover Ratio of **SAIL** "There is a significant difference in Inventory turnover ratio of the company". In case of Debtor Turnover Ratio of **JINDAL** "There is a significant difference in Inventory turnover ratio of the company". In case of Debtor Turnover Ratio of **STEEL EXCHANGE OF INDIA** "There is a significant difference in Inventory turnover ratio of the company.

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