

# A STUDY ON INVENTORY MANAGEMENT IN JSW STEELS LTD.

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**ABSTRACT:** A Study on Inventory management in JSW Steels Ltd. was chosen for the study because best-practice inventory management is essential to success in the competitive metals-manufacturing market for any organisation. JSW Steels, being a company in the top quartile of inventory turnover tend to have no more than three to four days of raw materials on hand. A rigorous analytical approach to inventory management can be established on the basis of robust, reliable data of five years. This is done by establishing a firm grip on raw materials, work in process (WIP), and finished goods so that JSW Steel Ltd. will be able to increase its efficiency and free up cash all along the value chain, and also use their newfound liquidity to, for example, make critical CAPEX investments and strategic acquisitions.

A financial ratio or accounting ratio is a relative degree of two or more selected numerical values taken from an enterprise's financial statements such as profit and loss account and balance sheet. Financial ratios used to analyse the liquidity and profitability of the various elements. Inventory being the obsolete asset of the company is analysed using different ratios to determine that there is neither under stocking nor over stocking.

Correlation Analysis is the statistical evaluation method that is used to study the strength of the relationship between two, numerically measured, continuous variables. In order to provide financial position of the organisation by analysing different items of the financial statements, correlation is also helpful and necessary.

**KEYWORDS:** Inventory Management, Inventory, Financial Ratios, Correlation Analysis

## INTRODUCTION:

Inventory can be defined as stock maintained between any two processes for uninterrupted operation. It is also defined as assets that are intended for sale, or are in the process of being produced for sale, or are to be used in producing goods (Stitchworld, 2012). Inventory is predominantly maintained due to two reasons - to enhance the sourcing cost (where requirement can be predicted) and to curtail the risk of stock out (where requirement cannot be predicted). The more the inventory, the more the capital blockage, and/or the more the space requirement; on the other hand, lower inventory may lead to interruption in production or unsatisfied customers. The management of inventory is a problem common to all organizations of the economy as the wealth of stakeholders also lies in the warehouse. More than 60% of working capital is generally being invested in the inventory. Inventory management is primarily concerned with obtaining correct balance between two extremes of under stocking and over stocking so that they are carried on so that they are available at the right quantity, at the right point of time. Regarded in that perspective, inventory management has a broad scope and affects a great or number of activities in an organization. Therefore, management of inventory is very important for every organization.

## STATEMENT OF PROBLEM:

Higher production of value-added products, capacity expansion, up-gradation of production process, achieving cost effective production in environment friendly manner have become 'trust areas of the steel industry', though there have been no shortage of the steel materials in the country after liberalization. As a result, the steel performance after introduction of new economic policy provides a fertile ground to investigate into its management, especially that of its inventory management. Inventory is defined as an indolent resource which has an economic value. In an industry, inventories are held so that they are carried on so that they are available at the right quantity, at the right point of time. Carrying excessive inventory not only results in blocking up working capital but also adds inventory carrying cost to it which includes interest on locked working capital cost of storage, obsolescence and deterioration. On an average it works out to 20% to 25% per annum of the value of locked up inventory. Thus, the study was carried out to study the present inventory management practices and policies of JSW Steels Ltd and suggest measures for improving the management and control of inventory.

## OBJECTIVES OF THE STUDY:

- To assess the significance of inventory management by few important parameters like Inventory Turnover Ratio, Days Sales to Inventory and Inventory to Working Capital Ratio.
- To measure the direction and strength of the linear relationship between inventory and current assets using Correlation Analysis.

**SOURCE OF DATA:**

The study is based on Secondary data which includes data gathered from books, journals, magazines, Ph.D. thesis, websites and Annual Reports of JSW Steel Ltd.

**PERIOD OF THE STUDY:**

A period of five years from 2014 to 2018 has been taken for the study.

**TOOLS USED FOR THE STUDY:**

The following tools have been applied to the study:

1. Ratio Analysis
2. Correlation Analysis

**LIMITATIONS OF THE STUDY:**

- ❖ The period of study is for five years would not be generalized for future. Changes in policies and practices of the management in the future can affect the results.
- ❖ Although the attempt to analyse all available resources was given, it was not possible due to time constraints.

**REVIEW OF LITRATURE:**

**Prem Kumar & Asit K Ghosh** (1991) has viewed that inventories are basically stock of resources held for the purpose of future production or sales. Inventories may be regarded as an idle resource which has an economic value. Better management of inventories would help in the release of capital for use elsewhere, productively.

**Sudhindra Bhat** (2008) in his book 'Financial Management' explains inventory management as an important area of working capital management, which plays a crucial role in economic operation of the firm. Maintenance of large size inventories by a firm required a considerable amount of funds to be invested on them. Inventory management has to be efficient and effective in order to avoid unnecessary investment and inadequate investment.

**Udhaya Kumar T S** (2010) explains that by managing inventory it becomes easier for the organization to meet the profit goals, help shorten the cash cycle, avoid inventory shortage and avoid excessive carrying costs for unused inventory. According to his study, companies need to get smart about inventory. Boosting financial performance is an added benefit that tends to come from better inventory management practices.

**Srinivas Rao Kasisomayajula** (2014) An analytical study was conducted on "Inventory Management in Commercial Vehicle Industry In India". In his study, he concluded that all the units in the industry have significant relationship between Inventory and Sales. Proper management of inventory is important to maintain and improve the health of an organization. Efficient management of inventories will improve the profitability of the organization.

**PROFILE OF THE COMPANY:**

JSW Steel, the flagship company of the JSW Group is one of India's leading steel players with integrated steel manufacturing facilities. With an annual capacity of 18 mtpa, JSW Steels Ltd. has seven state-of-the-art manufacturing units covering western and southern India and a strategic overseas existence, making it one among the leading integrated steel players in the world. JSW Steels Ltd. produces and markets a highly diversified portfolio of steel products. The company achieved a capacity utilisation of 91% and posted its highest ever production, shipments, revenue and EBITDA during the FY18. The company's expenditure on material consumption increased by 34% from RS.27,955 crores in FY17 to RS.37,470 crores in FY18 primarily on account of increase in production volumes and increase in cost of input raw materials like iron ore and coal. The average inventory holding in terms of number of days as on 31<sup>st</sup> March 2018 for finished goods was 20 days vis-à-vis 33 days as on 31<sup>st</sup> March 2017. However, overall inventory holding has come down to 64 days for FY18 vis-à-vis 66 days for FY17. The value of inventories increased by 9% predominantly due to higher cost of raw materials like coal and iron ore and spares as against the previous year. However, the inventory of steel products (SFG/FG) reduced by 1.47 lakh tonnes during FY18.

**ANALYSIS AND INTERPRETATION:****Ratio Analysis for JSW Steels Ltd.:**

- **Inventory Turnover Ratio:**

Inventory turnover is a ratio that shows how many times a company has sold and replaced inventory during a given period. It shows how efficiently the company is managing its production, warehousing, and distribution of product, considering its volume of sales. Inventory Turnover Ratio is important because it analyses two main components of performance. The first

component is stock purchasing. If huge amounts of inventory are purchased during the year, the company will have to vend greater amounts of inventory to boost its turnover. If the company can't sell these larger amounts of inventory, it will incur carrying costs and other holding costs. The second component is sales. Sales must match inventory purchases or the carrying of inventory will not turn effectively.

$$\text{Inventory turnover ratio} = \text{Cost of goods sold} / \text{Average inventory}$$

Where Cost of goods sold = Sales – Gross Profit, and

$$\text{Average Stock} = (\text{Opening Stock} + \text{Closing Stock})/2.$$

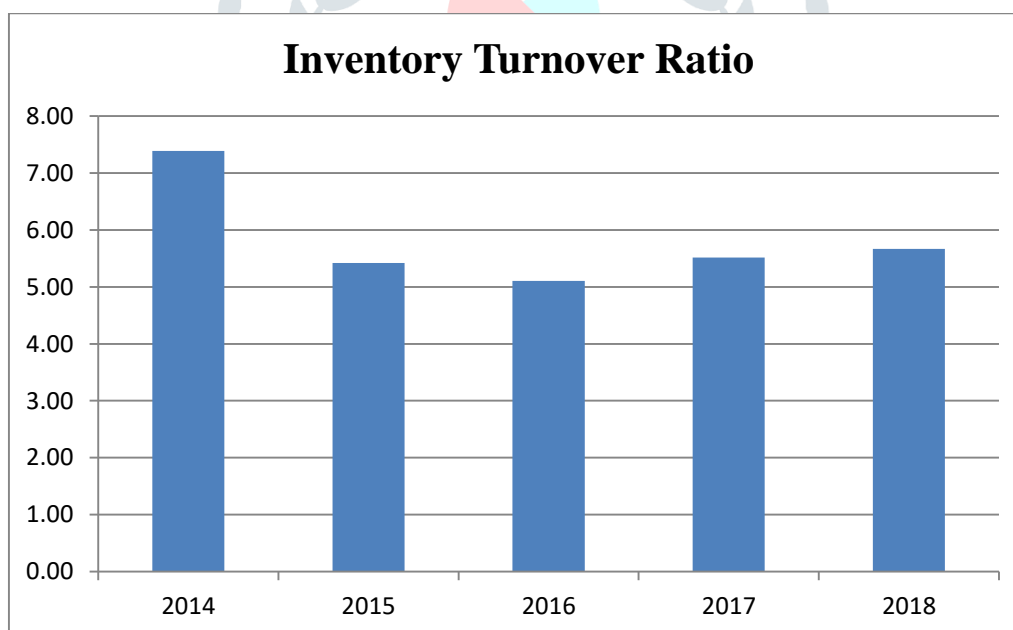
**Table 1: Table Showing Cost of Goods Sold And Average Stock of JSW Steel Ltd.**

Rs. (in crores)

Year ending March	Cost of goods sold			Average Stock			Inventory Turnover Ratio
	Sales	Gross Profit	Cost of Goods Sold	Opening Stock	Closing Stock	Average Stock	
2014	45297.72	4681.21	40616.51	4799.10	6196.57	5497.84	7.39
2015	46087.32	6033.42	40053.90	6196.57	8584.74	7390.66	5.42
2016	36706.92	-2392.03	39098.95	8584.74	6741.74	7663.24	5.10
2017	52290.00	8156.00	44134.00	6741.74	9270.00	8005.87	5.51
2018	64975.00	10129.00	54846.00	9270.00	10082.00	9676.00	5.67

Source: Secondary data (Standalone Financial Statements of JSW Steel Ltd)

**Chart 1: Chart Showing Inventory Turnover Ratio of JSW Steel Ltd**



#### Interpretation:

In the year 2014, the inventory turnover ratio was the highest implying that there were either strong sales or ineffective buying. A high inventory turnover ratio may direct better liquidity, but it can also indicate a poor inventory levels, which may lead to a loss in business. But from the year 2017-2018 the inventory turnover ratio is maintained at 5 times which indicates that on average the inventory had turned over every 60 or 67 days.

- **Days Sales of Inventory:**

The days sales of inventory (DSI) is a ratio that indicates the average time in days that an organisation takes to turn its inventory, including work in progress and spares and consumables into sales.

DSI is also known as **Inventory Conversion Period, Average Age of Inventory, Days Inventory Outstanding (DIO), Days in Inventory (DII), Days Sales in Inventory or Days Inventory** and is interpreted in various ways. Indicating the liquidity of the inventory, the results represent how many days the inventory of a company will last. Generally, a lower inventory conversion period is preferred as it indicates a shorter period to clear off the inventory, though the average inventory conversion period varies from one industry to another.

$$\text{Days Sales of Inventory} = (\text{Average Inventory} / \text{Cost of Goods Sold}) * 365$$

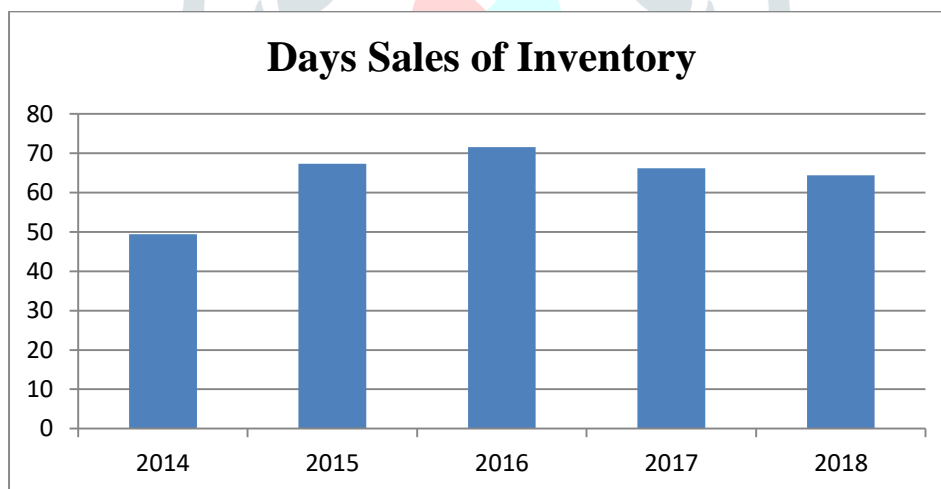
**Table 2: Table Showing Average Inventory And Cost of Goods Sold Of JSW Steel Ltd.**

Rs. (in crores)

Year ending March	Average Inventory			Cost of goods sold			Days Sales of Inventory
	Opening Inventory	Closing Inventory	Average Inventory	Sales	Gross Profit	Cost of goods sold	
2014	4799.10	6196.57	5497.84	45297.72	4681.21	40616.51	49
2015	6196.57	8584.74	7390.66	46087.32	6033.42	40053.90	67
2016	8584.74	6741.74	7663.24	36706.92	-2392.03	39098.95	72
2017	6741.74	9270.00	8005.87	52290.00	8156.00	44134.00	66
2018	9270.00	10082.00	9676.00	64975.00	10129.00	54846.00	64

Source: Secondary data (Standalone Financial Statements of JSW Steel Ltd)

**Chart 2: Chart Showing Days Sales of Inventory of JSW Steel Ltd**



#### Interpretation:

The period of holding is in the average of 64 days. The days sales of inventory have come down from 64 days in FY18 vis-à-vis 66 days for FY 17. It is clear that the number of holding days is fluctuating but stays between

- **Inventory to Working Capital Ratio:**

Inventory to working capital ratio is the method to show as to what portion of a company's inventories is financed from the cash that is available. This is essential to businesses such as steel industries where they hold inventory to a greater extent.

Inventory to Working Capital Ratio is the important indicator of the operation efficiency. Note that a low value of 1 or less of this ratio means that a company has high liquidity of current asset but it may also indicate insufficient inventory levels. A high value of this ratio means that a company is carrying too much inventory. Because excessive inventories can place a heavy burden on the cash resources of a company, it is not favourable for management.

$$\text{Inventory to Working Capital Ratio} = \text{Inventory} / \text{Working Capital}$$

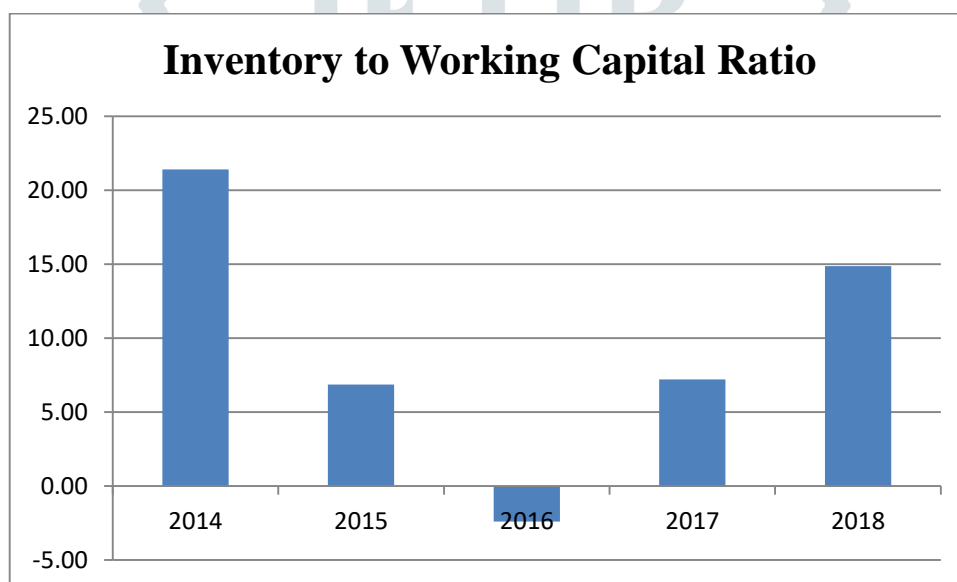
**Table 3: Table Showing Inventory and Working Capital of JSW Steel Ltd.**

Rs. (in crores)

Year ending March	Inventory	Working Capital			Inventory to Working Capital Ratio
		Current Assets	Current Liabilities	Working Capital	
2014	6196.57	14831.11	14541.5	289.62	21.40
2015	8584.74	19023.96	17774.2	1249.74	6.87
2016	6741.74	13463.59	16286	-2822.41	-2.39
2017	9270.00	17498.00	16213	1285.00	7.21
2018	10082.00	19253.00	18575	678.00	14.87

Source: Secondary data (Standalone Financial Statements of JSW Steel Ltd)

Chart 3: Chart Showing Inventory to Working Capital Ratio of JSW Steel Ltd

**Interpretation:**

From the workings and the chart, it is clear that in the year 2014 and 2015 the ratio of the company was quite high. But in the year 2016, the ratio of inventory to working capital is -2.39 where the value is 1 or less than one indicating the high liquidity in that year. But in the succeeding years, the ratio is high that indicates that there is low liquidity.

**Correlation Analysis for JSW Steels Ltd:**

The present section aims at analysing the correlation coefficient under the following combination of variables to study the degree of relationship existing between them:

Relationship between inventory and current assets

Table 4: Table Showing the Correlation between Inventory and Current Assets.

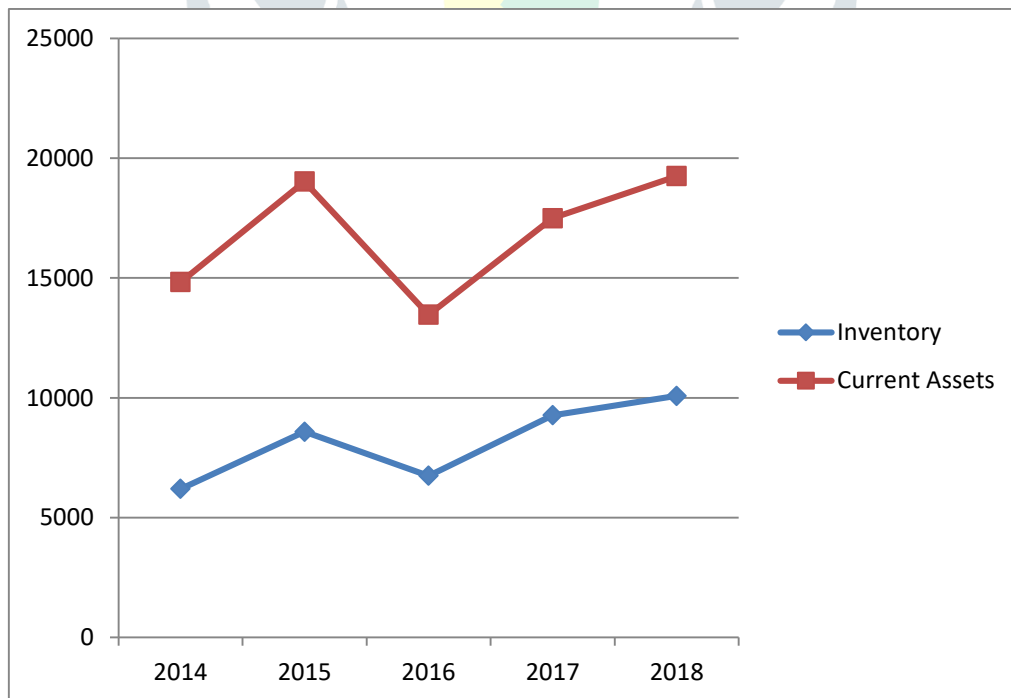
Year ending March	Inventory (x)	X = (x-x')	X <sup>2</sup>	Current Assets (y)	Y = (y-y')	Y <sup>2</sup>	XY
2014	6196.57	-1978.44	3914224.83	14831.11	-1982.82	3931575.15	3922890.401
2015	8584.74	409.73	167878.67	19023.96	2210.03	4884232.60	905515.5919
2016	6741.74	-1433.27	2054262.89	13463.59	-3350.34	11224778.12	4801941.812
2017	9270.00	1094.99	1199003.10	17498.00	684.07	467951.76	749049.8093
2018	10082.00	1906.99	3636610.86	19253.00	2439.07	5949062.46	4651282.099
			10971980.36			26457600.10	15030679.71

$$\begin{aligned}
 x' &= \Sigma x/n \\
 &= 40875.05/5 \\
 &= 8175.01
 \end{aligned}$$

$$\begin{aligned}
 y' &= \Sigma y/n \\
 &= 84069.66/5 \\
 &= 16813.93
 \end{aligned}$$

$$\begin{aligned}
 \text{Correlation Coefficient R} &= \Sigma XY / \sqrt{X^2 Y^2} \\
 &= 15030679.71 / \sqrt{(10971980.36 * 26457600.10)} \\
 &= 0.882(\text{Approx.})
 \end{aligned}$$

Chart 4: Table Showing the Correlation between Inventory and Current Assets



**Interpretation:**

The table shows the relationship between inventory and current assets. It shows that the relationship between the two variables is 0.882. It indicates that the variables have a POSITIVE correlation i.e. inventory and current assets are increasing in the same direction.

**Relationship between inventory and raw materials:****Table 5: Table Showing the Correlation between Inventory and Raw Materials.**

Year ending March	Inventory (x)	X = (x-x')	X <sup>2</sup>	Raw materials	Y = (y-y')	Y <sup>2</sup>	XY
2014	6196.57	-1978.44	3914225	27200.6	-849.56	721752.1936	1680803
2015	8584.74	409.73	167878.7	27731.2	-318.96	101735.4816	-130687
2016	6741.74	-1433.27	2054263	18916	-9134.16	83432878.91	13091718
2017	9270	1094.99	1199003	29345	1294.84	1676610.626	1417837
2018	10082	1906.99	3636611	37058	9007.84	81141181.47	17177861
			10971980			167074158.7	33237531

$$x' = \Sigma x/n$$

$$= 40875.05/5$$

$$= 8175.05$$

$$y' = \Sigma y/n$$

$$= 140250.8/5$$

$$= 28050.16$$

**Correlation Coefficient R**

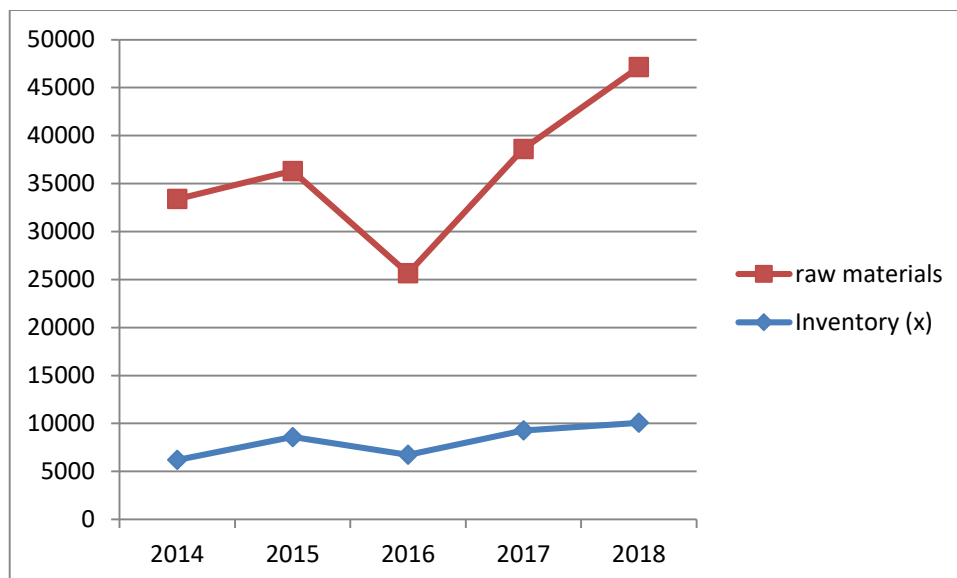
$$= \frac{\Sigma XY}{\sqrt{\Sigma X^2 \Sigma Y^2}}$$

$$= \frac{33237531}{\sqrt{(10971980 * 167074158.7)}}$$

$$= 0.776 \text{ (approx)}$$

**Chart 5: Chart Showing the Correlation between Inventory and Raw Material**





### Interpretation:

The table shows the relationship between inventory and raw materials. It shows that the relationship between the two variables is 0.776. It indicates that the variables have a POSITIVE correlation i.e. inventory and raw materials are increasing in the same direction.

### FINDINGS:

1. The ideal inventory turnover ratio is between 4 to 6 which usually means that the rate at which the restocking is well balanced with sales. As per the analysis for the given years, the ratio has been fluctuating within the ideal ratio. Therefore it shows more or less favourable position.
2. The Inventory Conversion Period in terms of number of days as on 31<sup>st</sup> March 2018 is 67 days vis-à-vis 77 as on 31<sup>st</sup> March 2017, thereby indicating the high liquidity of JSW Steels Ltd. as the cash becomes liquid once every 67 days which is less than the previous year by 10 days.
3. Inventory to Working Capital Ratio shows an increasing trend which is unfavourable as it indicates low liquidity. Liquidity was high in the year 2016 as the ratio is -2.39 which less than 1. Sometimes it can also mean insufficient inventory or under stocking.
4. Correlation analysis shows the relationship between various variables:
  - Correlation Analysis between Inventory and Current Assets was positive with a correlation coefficient of 0.882 showing that inventory and current assets are increasing in the same direction with the same magnitude.
  - Correlation Analysis between Inventory and Raw Materials was positive with a correlation coefficient of 0.776 showing that inventory and raw materials are increasing in the same direction indicating that a increase in raw materials will result the same in inventory.

### SUGGESTIONS:-

- Physical verification of the stores helps in setting the discrepancies observed between the book balance and physical balance.
- In order to face the stiff competition, modern techniques are to be adopted in inventory management.
- The company can also adopt the ABC analysis technique in order to have a better control on the inventory.
- Some obsolete materials must be properly accounted and disposed of as their value is much less.

### CONCLUSION:

After the study, we can come to a conclusion that, effectiveness of inventory management should improve in all the aspects. In any business, make it big or small, we must understand that taking good care of our inventory is vital. A truly effective inventory management system will reduce the complications involved in production planning, executing and controlling a supply chain network which is critical to business success. Hence the industry can still make stronger its position by looking into the following:

- The inventory should be fast moving and it should not be under stocking so that warehouse cost can be reduced.
- The finished goods have to be dispatched in right time as soon as manufacturing is completed.
- Proper inventory control techniques are employed by the inventory control organization within the structure of one of the basic models like ABC analysis.



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