

Inventory Management: Performance Appraisal of Selected Paper Companies

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Abstract: *Inventory management enhances business operations with the effective flow of goods and services. Inventory Management and control implies the controlling of business stock or controlling the movement of products and services following their demand. Inventory Management and control are highly beneficial in today's business world as it makes a vital part in any business success/failure having intense competition within its industry. This research paper is mainly based on the secondary data like as annual reports of 10 companies. Its main objectives are to evaluate the liquidity position of the paper companies. For use ratio analysis for accounting tools and statistical tools for getting results like as average, S.D. C.V. Maximum and Minimum and used One way ANOVA test. Mainly included two ratios in this research paper.*

Keywords: S.D, C.V., ANOVA, Turnover, Inventory

1. Introduction

The main aim of an inventory management system is to keep the stock in such a way that it is neither overstock nor understock. The overstock condition will reduce the other production processes and understock will lead to stoppage of work. The objectives of inventory management are operational and financial. In operational, materials and stock should be available in sufficient amount whereas, in functional, the minimum working capital should be locked in. An effective management should.

- Ensure a continuous supply to materials to facilitate uninterrupted production.
- Maintain sufficient stock of raw materials in period of short supply and anticipate price changes.
- Maintain sufficient finished goods inventory for smooth sales operation and efficient customer service.
- Minimise the carrying costs and time.
- Control investment in inventories and keep it at an optimum level.

Meaning of Inventory Management

According to Investopedia

Inventory management refers to the process of ordering, storing and using a company's inventory. This includes the management of raw materials, components and finished products, as well as warehousing and processing such items. For companies with complex supply chains and manufacturing processes, balancing the risks of inventory gluts and shortages is especially difficult. To achieve these balances, firms have developed two major methods for inventory management.

According to Wikipedia

Inventory management is a discipline primarily about specifying the shape and placement of stocked goods. It is required at different locations within a facility or within many locations of a supply network to precede the regular and planned course of production and stock of materials.

Title of the problem

“Inventory Management: Performance Appraisal of Selected Paper Companies in India”

Objectives of inventory management

The objective of inventory management consists of two counter-balancing parts:

- To meet a demand the firm's investment in inventory and
- To meet a demand for the product by efficiently organising the firm's production and sales operations.

2. Review of Literature

P. R. Halani & M.P.Shah (2015) in their paper highlighted that the Inventory Management: A Comparative Study of Selected Paper Companies. Its main objectives are to evaluate the liquidity position of the paper companies. The inventory (stock) turnover ratio of selected paper companies shown an average 7.93 times. It means sales were more than average inventory. It also means that the company is in a position to used/sold bulk quantity.

Vasundhara Dahiwale & Pallawi B. Sangode (2019) in their paper highlighted that the A Comparative Study of the Inventory Management Tools of Textile Manufacturing Firms. The main objective of this research is to examine the inventory management tools used in the manufacturing industries and study the impact of inventory management tools on the operations performance of the firm. the study found out that companies used inventory management tools and information technology to improve the effectiveness of the operations performance.

Testing of Hypotheses

Statistics which helps to the researcher in arriving at the creation for such decisions is known as testing hypothesis. The theory of testing hypothesis was established by J. Neyman and E. S. Pearson and employs statistical techniques to arrive at decision in certain situations where there is fixed in advance. Below explain certain basically idea related with the testing hypothesis

Statistical Hypothesis:

Simple and Composite: - A statistical hypothesis is some assumption or statement, which may or may not be true, about a population or equivalently about the probability distribution characterising the given population, which researcher want to test on the basis of the evidence from the random sample. If the hypothesis is completely specific the population, then it is known as simple hypothesis, otherwise it is known as composite hypothesis.

Null Hypothesis

The random selection of the samples from the given population makes the tests of significance valid for the researchers. For applying any test of significance researcher first set up a null hypothesis.

In the word of Professor R. A. Fisher "null hypothesis is the hypothesis which is tested for possible rejection under the assumption that is true". It is usually denoted by H_0 .

For the analysis of the working capital trends of selected paper companies in following null hypotheses will be tested:

Ho: Null Hypothesis

- There is no significant difference in Inventory to working capital ratio of selected paper companies of India.
- There is no significant difference in Inventory (stock) turnover ratio of selected paper companies of India.

H1: Alternative Hypothesis

- There is significant difference in Inventory to working capital ratio of selected paper companies of India.
- There is significant difference in Inventory (stock) turnover ratio of selected paper companies of India.

3. Research Methodology

The study was preliminary based on the published accounts and annual report of all the selected paper companies under review.

Out of which selected companies were in the public sector and private sector.

Period of the Study

The present study was undertaken by the researcher for the period of seven (7) Accounting years from 2013-2014 to 2019-20. The researcher had selected the base year 2013-2014 because this year was normal for the present research of analysis and evaluation.

Sample of the Study

By the researcher following companies were had been selected for the purpose of the present research.

- 1) Andhra Paper Limited (APL)
- 2) Satia Industries Limited (SIL)
- 3) JK Paper Mills Limited (JKPL)
- 4) Orient Paper and Industries Limited (OPIL)
- 5) Seshasayee Paper and Boards Limited (SPBL)
- 6) Emami Papers Mills Ltd (EPML)
- 7) South India Paper Mills Limited (SIPML)
- 8) Star Paper Mills Limited (SPML)

- 9) T. N. Newsprint Paper Mills Limited (TNNPL)
- 10) West Coast Paper Mill (WCPML)

Method of Data Collection

The main source of data used for the study was secondary drawn from the annual profit and loss account and balance sheet figures as found in the annual reports of the selected paper companies. The selected data was complemented through selected paper companies web site and capital line software.

Methods of Analysis and Interpretation of Data

In order to analyze the present research work on "INVENTORY MANAGEMENT A COMPARATIVE STUDY OF SELECTED PAPER COMPANIES IN INDIA" various techniques of financial management like as ratio analysis and various statistical techniques used by the researcher as under:-

Accounting Techniques

- Ratio Analysis

Statistical Techniques

- Arithmetic Mean
- The Standard Deviation:
- Co-Efficient of Variation:
- One-way Analysis of Variance Test (ANOVA)

4. Data Analysis**1) Inventory to Working Capital Ratio:**

Meaning: This Ratio establishes a relationship between inventory and working capital.

Objective: The objective of computing this ratio is to measure the amount of working capital invested in inventory.

Components:

Inventory: It refers to raw material, semi finished good and finished goods.

Working Capital = current assets- current liabilities.

Computation and interpretations:

This ratio is computed by dividing the inventory and working Capital or net current Assets. This ratio is usually express as a pure ratio e.g. 3:1. In the form of a formula, this ratio may be express as follows:

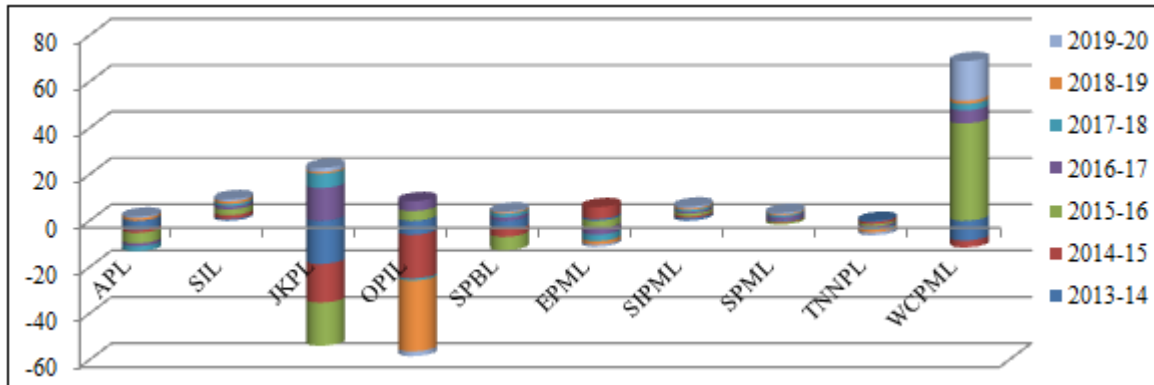
$$\text{Inventory to working Capital} = \frac{\text{Inventory}}{\text{Working Capital}}$$

This ratio indicates that inventory should not over the working capital. Around three quarter i.e.0.75 times of working capital generally preferred. Thus, an enterprise should have neither a very high nor a very low ratio; it should have a satisfactory ratio. To judge whether the ratio is satisfactory or not, it should be compare with its own past ratio or with the ratio of similar firm in the same industry or with the industry average.

The inventory to working capital of selected paper in India is given in the Table No-1.1 as follows:

Table 1.1: Inventory to Working Capital Ratio period from 2013 –14 to 2019 –20

YEAR	Company Name									
	APL	SIL	JKPL	OPIL	SPBL	EPML	SIPML	SPML	TNNPL	WCPML
2013-14	-4.04	0.80	-18.59	-6.01	-3.53	0.81	1.09	-0.37	-0.46	-8.46
2014-15	-1.13	1.61	-16.65	-18.82	-3.34	5.08	0.82	-0.42	-1.00	-3.01
2015-16	-4.49	2.50	-18.64	4.21	-5.76	-3.04	1.17	-0.81	-0.79	42.00
2016-17	-1.25	1.32	14.17	4.26	1.47	-2.88	0.77	1.58	-0.94	5.64
2017-18	-2.15	1.04	6.11	-0.93	1.54	-2.77	0.83	0.70	-0.61	2.80
2018-19	1.15	1.13	0.72	-30.53	0.53	-1.47	0.66	0.49	-1.18	1.29
2019-20	0.64	0.93	1.80	-2.08	0.46	-1.06	0.81	0.61	-1.30	17.14
Average	-1.61	1.33	-4.44	-6.86	-0.95	-0.76	0.88	0.25	-0.90	8.20
S.D.	1.98	0.54	12.39	12.15	2.92	2.70	0.17	0.77	0.28	15.63
C.V.	-1.22	0.40	-2.79	-1.77	-3.07	-3.55	0.19	3.08	0.31	1.91
Min	-4.49	0.80	-18.64	-30.53	-5.76	-3.04	0.66	-0.81	-1.30	-8.46
Max	1.15	2.50	14.17	4.26	1.54	5.08	1.17	1.58	-0.46	42.00



Graph 1.1: Inventory to Working Capital Ratio in Times from 2013-14 to 2019-20

The above mentioned Table No- 1.1 and Graph No- 1.1 show the indicated a fluctuating trends of the Inventory to working capital ratio of selected paper companies in India from 2013-14 to 2019-20.

The Inventory to Working Capital Ratio of selected paper companies during the study period has been shown an average -0.49 times During the study period the Andhra Pradesh Paper Mills Limited was shown an average Inventory to Working Capital Ratio of -1.61 times, Satia Industries Limited was shown an average Inventory to Working Capital Ratio of 1.33 times JK Paper Mills Limited was shown an average Inventory to Working Capital Ratio of -4.44 times Orient Paper and Industries Limited was shown an average Inventory to Working Capital Ratio of -6.86 times Seshasayee Paper and Boards Limited was shown an average Inventory to Working Capital Ratio of -0.95 times, Emami Papers Mills Ltd was shown an average Inventory to Working Capital Ratio of -0.76 times, South India Paper Mills Limited was shown an average Inventory to Working Capital Ratio of 0.88 times, Star Paper Mills Limited was shown an average Inventory to Working Capital Ratio of 0.25 times, T. N. Newsprint Paper Mills Limited was shown an average Inventory to Working Capital Ratio of -0.90 times, West Coast Paper Mills Limited was shown an average Inventory to Working Capital Ratio of 8.20 times.

Maximum Inventory to Working Capital Ratio was 42 times in the West Coast Paper Mill in the year 20015 –16 and minimum Inventory to Working Capital Ratio was –30.53 times in Orient Paper and Industries Limited in the year 2018 –19.

ANOVA Test of Inventory to Working Capital Ratio: Hypothesis:

Ho: Null Hypothesis:

There is no significant difference in Inventory to working capital ratio of selected paper companies of India.

H1: Alternative Hypothesis:

There is significant difference in Inventory to working capital ratio of selected paper companies of India.

Level of Significance: 5%

Table 1.2: Inventory To Working Capital Ratio - ANOVA: Single Factor

SUMMARY				
Groups	Count	Sum	Average	Variance
APL	7	-11.27	-1.61	3.92
SIL	7	9.33	1.33	0.29
JKPL	7	-31.08	-4.44	153.51
OPIL	7	-48.04	-6.86	147.62
SPBL	7	-6.63	-0.95	8.53
EPML	7	-5.33	-0.76	7.29
SIPML	7	6.15	0.88	0.03
SPML	7	1.78	0.25	0.59
TNNPL	7	-6.28	-0.90	0.08
WCPML	7	57.4	8.2	244.30

Table 1.3: ANOVA (F- Test Result) of Inventory To Working Capital Ratio

Source of Variation	SS	D.F	MS	F	P-value	F crit
Between Groups	1,039.78	9	115.53	2.04	0.5367	2.04
Within Groups	3,396.96	60	56.62			
Total	4,436.74	69				

Degree of freedom = 70-1 = 69

Table Value of 'F' =2.0401
Calculate Value of 'F' = 2.0401

F calculate = F table
2.0401 = 2.0401
F calculate = F table

Table No – 1.3 indicates the calculate value of 'F' is 2.0401 and the table value of 'F' at 5% level of significance is 2.0401 so, the calculate value of 'F' which is equal to the table value. It indicates that the Null Hypothesis is accepted and Alternate Hypothesis is rejected. It indicates that there is no significant in inventory to working capital ratio of selected paper companies in India.

2) Stock (Inventory) Turnover Ratio:

Meaning: This Ratio establishes a relationship between Cost of Goods Sold and Average Stock

Objective

The objective of computing this ratio is to determine the efficiency with which the Stock is converted into sales

Components

Cost of Goods sold =Net sales –Gross Profit

Average Stock = (opening Stock +closing Stock)/2

Computation and interpretations

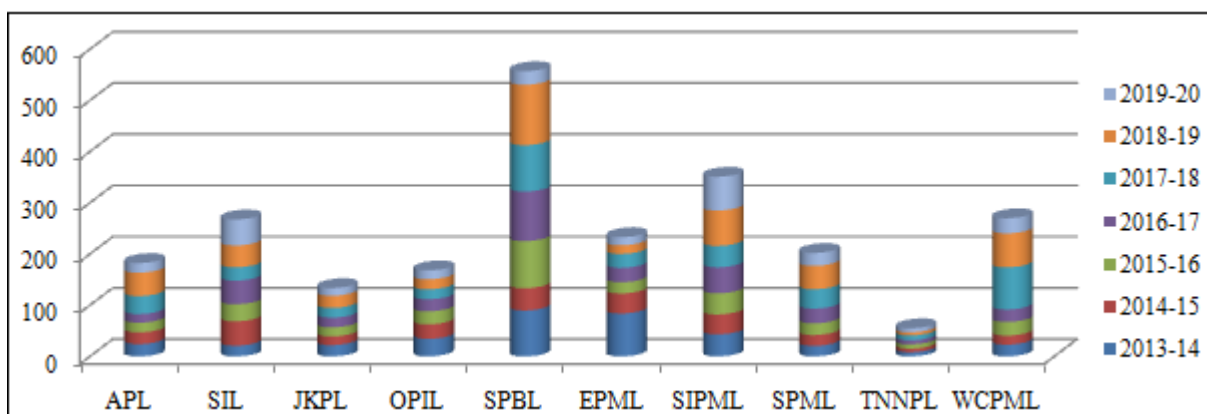
This ratio is computed by dividing the cost of goods sold by the average Stock. This ratio is usually express as an 'x' number of times. In the form of a formula, this ratio may be express as follows:

$$\text{Stock Turnover Ratio} = \frac{\text{Cost of Goods Sold}}{\text{Average Inventory}}$$

This ratio indicates the speed with which the Stock is converted into sales. In general, a high ratio indicate efficient performance since an improvement in the ratio shows that either the same volume of sales has been minted with a lower investment in stocks, or the volume of sales has increased without any increase in the amount of stock. A too high ratio may be the result of very low Stock levels which may result in frequent stock-outs and thus the firm may incur high stock out costs. Thus, a firm should have a satisfactory ratio. To judge whether the ratio is satisfactory or not, it should be compare with its own past ratio or with the ratio of similar firm in the same industry or with the industry average.

Table 1.4: Inventory Turnover Ratio period from 2013 –14 to 2019 –20

		Company Name									
YEAR	APL	SIL	JKPL	OPIL	SPBL	EPML	SIPML	SPML	TNNPL	WCPML	
2013-14	23.91	20.97	21.96	34.35	89.67	83.73	43.05	20.62	8.33	22.90	
2014-15	22.97	47.58	17.11	28.25	43.53	39.13	38.88	21.20	6.80	17.65	
2015-16	19.00	33.22	17.64	25.50	91.91	22.03	41.15	22.71	8.48	26.78	
2016-17	16.83	46.39	19.01	23.64	97.10	28.08	50.88	28.89	7.97	24.37	
2017-18	35.11	25.83	19.04	19.40	90.32	27.14	41.89	37.81	9.39	82.34	
2018-19	45.71	42.70	23.70	19.46	118.19	17.01	69.20	45.71	6.06	66.24	
2019-20	18.87	50.82	15.07	17.64	26.36	15.85	65.97	25.14	8.06	29.61	
Average	6.06	38.22	19.08	24.03	79.58	33.28	50.15	28.87	7.87	38.56	
S.D.	9.78	10.75	2.72	5.47	30.00	21.84	11.59	8.80	1.03	23.25	
C.V.	0.38	0.28	0.14	0.23	0.38	0.66	0.23	0.30	0.13	0.60	
Min	16.83	20.97	15.07	17.64	26.36	15.85	38.88	20.62	6.06	17.65	
Max	45.71	50.82	23.70	34.35	118.19	83.73	69.20	45.71	9.39	82.34	



Graph 1.2: Inventory Turnover Ratio Period from 2013-14 to 2019-20

The above mentioned Table No- 1.4 and Graph No- 1.2 show the indicated a fluctuating trends of the Inventory (stock) turnover ratio of selected paper companies in India from 2013-2014 to 2019-2020.

The Inventory Turnover Ratio of selected paper companies during the study period has been shown an average 34.57 times During the study period the Andhra Pradesh Paper Mills Limited was shown an average Inventory Turnover Ratio of 26.06 times, Satia Industries Limited was shown an average Inventory Turnover Ratio of 38.22 times JK Paper

Mills Limited was shown an average Inventory Turnover Ratio of 19.08 times Orient Paper and Industries Limited was shown an average Inventory Turnover Ratio of 24.03 times Sesha sayee Paper and Boards Limited was shown an average Inventory Turnover Ratio of 79.58 times, Emami Papers Mills Ltd was shown an average Inventory Turnover Ratio of 33.28 times, South India Paper Mills Limited was shown an average Inventory Turnover Ratio of 50.15 times, Star Paper Mills Limited was shown an average Inventory Turnover Ratio of 28.87 times, T. N. Newsprint Paper Mills Limited was shown an average Inventory Turnover Ratio of 7.87 times, West Coast Paper Mills Limited was shown an average Inventory Turnover Ratio of 38.56 times.

Maximum Inventory Turnover Ratio was 118.19 times in Seshasayee Paper and Boards Limited in the year 2018 –19 and minimum Inventory Turnover Ratio was 6.06 times in T. N. Newsprint Paper Mills Limited in the year 2018 –19.

ANOVA Test of Inventory (Stock) Turnover Ratio

Ho: Null Hypothesis

There is no significant difference in Inventory (stock) turnover ratio of selected paper companies of India.

H1: Alternative Hypothesis:

There is significant difference in Inventory (stock) turnover ratio of selected paper companies of India.

Level of Significance: 5%

Table 1.5: Inventory Turnover Ratio - ANOVA: Single Factor

SUMMARY				
Groups	Count	Sum	Average	Variance
APL	7	182.4	26.06	95.65
SIL	7	267.51	38.22	115.56
JKPL	7	133.53	19.08	7.40
OPIL	7	168.24	24.03	29.92
SPBL	7	557.08	79.58	900
EPML	7	232.17	33.28	476.99
SIPML	7	351.02	50.15	134.33
SPML	7	202.08	28.87	77.44
TNNPL	7	55.09	7.87	1.06
WCPML	7	269.89	38.56	540.56

Table 1.6: ANOVA (F- Test Result) of Inventory Turnover Ratio

Source of Variation	SS	D.F	MS	F	P-value	F crit
Between Groups	24,278.63	9	2,697.63	11.34	1.6526	2.0401
Within Groups	14,273.44	60	237.89			
Total	38,552.07	69				

Degree of freedom = 70-1= 69

Table Value of ‘F’ =2.0401

Calculate Value of ‘F’ = 11.34

F Calculate > F table

11.34 >2.0401

Calculate > F Table

Table No-1.6 indicates the calculate value of ‘F’ is 11.34 and the table value of ‘F’ at 5% level of significance is 2.0401 so, the calculate value of ‘F’ which is greater than

the table value. It indicates that the Null Hypothesis is rejected and Alternate Hypothesis is accepted. It indicates that there is significant in inventory (stock) turnover ratio of selected paper companies in India.

5. Suggestion

- 1) The inventory to working capital ratio of selected paper companies in India shown an average -0.49 times. The average of inventory turnover ratio was not satisfactory as those companies ratio below than average ratio as Andhra Paper Limited, JK Paper Mills Limited, Orient Paper and Industries Limited, Seshasayee Paper and Boards Limited, Emami Papers Mills Ltd and T. N. Newsprint Paper Mills Limited. Due to high value of inventory, there was insufficient coverage of working capital in companies. So, it is suggested that paper companies should try to reduce the volume of inventory and try to increase the current assets.
- 2) The inventory (stock) turnover ratio of selected paper companies shown an average 34.57 times. It means sales were more than average inventory. It also means that the company is in a position to used/sold bulk quantity. But it is suggested that Andhra Pradesh Paper Mills Limited, JK Paper Mills Limited, Orient Paper and Industries Limited, Emami Papers Mills Ltd, Star Paper Mills Limited and T. N. Newsprint Paper Mills Limited should decrease the average inventory as early as possible and try to increase the sales.

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