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A Correlation Study On Inventory Management In Indian Oil Corporation Limited

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I. ABSTRACT

Inventory management system provides information to efficiently manage flow of materials, effectively utilize peoples and equipment, coordinate internal activities and communicate with customers. Inventory management does not make decisions or manage operations; they provide the information to managers who make more precise and well-timed decisions to manage their operations. This project helps to identify how the company (Indian Oil Corporation Limited) manages its inventory and its effect on other few elements in the financials.

II. INTRODUCTION

Indian Oil Corporation Limited (IOCL), commonly known as Indian Oil is an Indian state government owned oil and gas company headquartered in New Delhi. It is the largest commercial oil company in the country. Indian Oil's business interests overlap the entire hydrocarbon value-chain, including refining, pipeline transportation, marketing of petroleum products, exploration and production of crude oil, natural gas and petrochemicals.

Inventory represents one of the most important assets of a business because the turnover of inventory denotes one the primary sources of revenue generation and consequent earnings for the company's shareholders. Inventory management is critical to the bottom line because inventory is a major asset that remains an investment until the products sell. Several costs are tied to inventory management because businesses must store, track, and insure inventory. Overall, best practices in inventory management involve sound purchasing plans to guarantee items are available when they are needed without having too few or too many on hand and the necessary tools for tracking existing inventory.

III. OBJECTIVE

To measure the direction and strength of the linear relationship between inventory and current assets using correlation analysis.

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IV. STATEMENT OF THE PROBLEM

Analysing the inventory management of a company helps to identify how the company maintains its inventory and whether it has a control on how much investment goes into it. Analysing inventory management of the company using correlation analysis, helps identify how much inventory is held in relation to the current assets of the company, how much is held as Finished goods in relation to raw materials. This study using correlation analysis is done using five years data such as the financials of the company from FY 2014-15 to 2018-19.

V. SCOPE OF THE STUDY

The study helps to analyse the level of inventory management of Indian Oil Corporation Limited. The Management of the Company can use this to analyse the amount of investment in inventory, level of costs incurred to carry the inventory, etc, The current attempt is to establish a correlation between the level of inventory and the current assets of the company.

VI. RESEARCH METHODOLOGY

Area of Study

The study is about Inventory Management of Indian Oil Corporation Limited with the use of their Annual Reports as secondary data with Correlation Analysis.

Source of Study

Secondary data is used for the purpose of this study. The financials of the company from their Annual Reports and other relevant data from websites and journals have been used.

Tools Used

Correlation Analysis

VII. LIMITATIONS OF THE STUDY

i. Secondary Data from the Annual Reports published by the company have been used.
ii. The data only pertains to the last five years.

VIII. REVIEW OF LITERATURE

i. **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 viewed as an idle resource which has an economic value. Better management of inventories would release capital for use elsewhere productivity.
ii. **Sudhindra Bhat (2008)** in his financial management explains inventory management in an important area of working capital management, which plays a

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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. Efficient and effective inventory management is necessary in order to avoid unnecessary investment and inadequate investment.

IX. ANALYSIS AND INTERPRETATION

In this paper, correlation analysis is done with:

a. Scatter diagram
b. Karl Pearson's Product Moment Correlation Coefficient

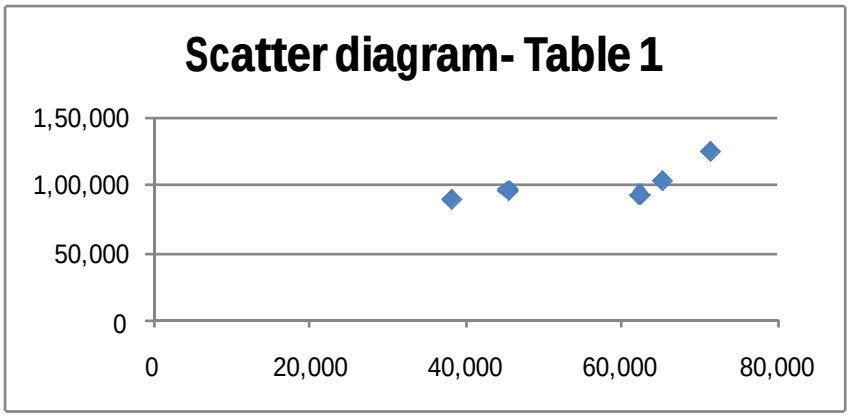
Scatter Diagram

The scatter diagram means that each of the points are plotted on the corresponding x-axis and y-axis.

Table 1(Amount in Rs. Crores)

Financial Year	*Inventory (X)*	*Current Assets (Y)*	X^2	Y^2	*XY*
2018-19	71,470	124,443	5,10,80,15,217	15,48,60,90,115	8,89,39,97,075
2017-18	65,313	103,055	4,26,58,15,401	10,62,03,26,842	6,73,08,50,897
2016-17	62,401	92,788	3,89,39,02,273	8,60,95,57,271	5,79,00,58,258
2015-16	38,282	89,350	1,46,55,42,150	7,98,33,76,038	3,42,05,22,487
2014-15	45,544	95,931	2,07,42,42,273	9,20,27,60,598	4,36,90,67,985
TOTAL	**283,011**	**505,567**	16,80,75,17,314	51,90,21,10,865	29,20,44,96,702

Source: Secondary data (Standalone Financial Statements of Indian Oil Corporation Limited)



Findings: The scatter diagram (Table 1) moves from the bottom left to the top right side. This signifies that the correlation between the Inventory held and the Current Assets is positive. That is, where the inventory increases, the current assets also increase.

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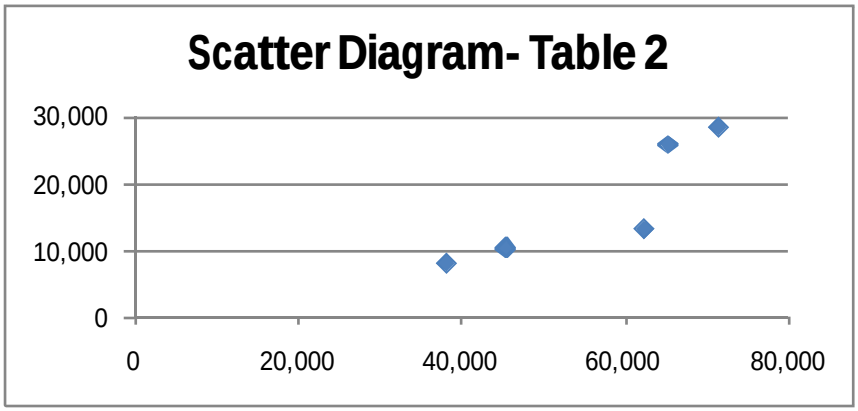
Table 2 **(Amount in Rs. Crores)**

Financial Year	*Inventory (X)*	*Raw Material (Y)*	X^2	Y^2	*XY*
2018-19	71,470	28,360	5,10,80,15,217	80,42,61,240	2,02,68,64,242
2017-18	65,313	25,783	4,26,58,15,401	66,47,39,369	1,68,39,40,449
2016-17	62,401	13,162	3,89,39,02,273	17,32,47,721	82,13,46,269
2015-16	38,282	8,005	1,46,55,42,150	6,40,73,141	30,64,34,151
2014-15	45,544	10,305	2,07,42,42,273	10,61,87,254	46,93,16,622
TOTAL	**283,011**	**85,614**	**16,80,75,17,314**	**1,81,25,08,725**	**5,30,79,01,733**

Source: Secondary data (Standalone Financial Statements of Indian Oil Corporation Limited)



Findings: The scatter diagram (Table 2) moves from the bottom left to the top right side. This signifies that the correlation between the Inventory held and the raw Material is positive. That is, where the Raw Material increases, the Inventory also increases.

Karl Pearson's Product Moment Correlation Coefficient

The correlation coefficient helps to establish the level of linear relationship between two variables. The formula for which is:

$$r = \frac{n(\Sigma xy) - (\Sigma x)(\Sigma y)}{\sqrt{[\,n\Sigma x^2 - (\Sigma x)^2\,]\,[\,n\Sigma y^2 - (\Sigma y)^2\,]}}$$

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2014-15	45,544	95,931	2,07,42,42,273	9,20,27,60,598	4,36,90,67,985
TOTAL	**283,011**	**505,567**	**16,80,75,17,314**	**51,90,21,10,865**	**29,20,44,96,702**

Source: Secondary data (Standalone Financial Statements of Indian Oil Corporation Limited)

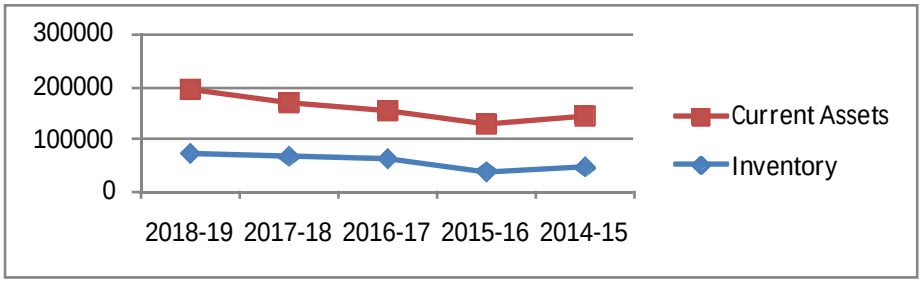
N= 5, Sum of:XY= 29,20,44,96,702, X^2= 16,80,75,17,314, Y^2= 51,90,21,10,865, X= 2,83,011, Y= 5,05,567

Correlation coefficient (r)=

$$\frac{5(29,20,44,96,702)-(2,83,011)(5,05,567)}{\sqrt{(5(16,80,75,17,314)-(2,83,011)^2)}\ \sqrt{(5(51,90,21,10,865)-(5,05,567)^2)}}$$

r = 0.75 (approx)

Chart showing correlation between Inventory and Current Assets



Findings: The correlation between Inventory and current assets is 0.75 (approx). This means that there is a positive and high level of correlation between Inventory and current assets.

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Table 2 **(Amount in Rs. Crores)**

Financial Year	*Inventory (X)*	*Raw Material (Y)*	X^2	Y^2	*XY*
2018-19	71,470	28,360	5,10,80,15,217	80,42,61,240	2,02,68,64,242
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2014-15	45,544	10,305	2,07,42,42,273	10,61,87,254	46,93,16,622
TOTAL	**283,011**	**85,614**	**16,80,75,17,314**	**1,81,25,08,725**	**5,30,79,01,733**

Source: Secondary data (Standalone Financial Statements of Indian Oil Corporation Limited)

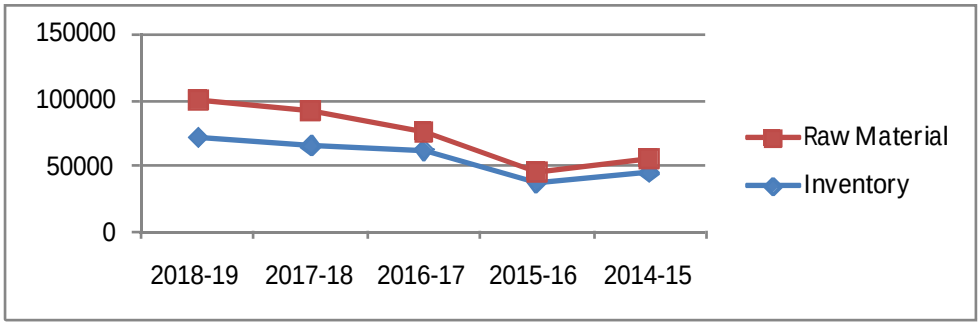
N= 5, Sum of: XY= 5,30,79,01,733, X^2= 16,80,75,17,314, Y^2= 1,81,25,08,725, X= 2,83,011, Y= 85,614

Correlation coefficient (r)=

$$\frac{5(5,30,79,01,733)-(2,83,011)(85,614)}{\sqrt{(5(16,80,75,17,314)-(2,83,011)^2)}\ \sqrt{(5(1,81,25,08,725)-(85,614)^2)}}$$

r = 0.88 (approx)

Chart showing correlation between Inventory and Raw Materials



Findings: The correlation between Inventory and Raw Materials is 0.88 (approx). This means that there is a positive and high level of correlation between Inventory and raw materials.

Interpretation

- The correlation between Inventory and Current assets is positive
- The correlation between Inventory and Raw Materials is positive
- The correlation co-efficient of Inventory and Current assets is 0.75 (approx.)
- The correlation co-efficient of Inventory and Raw Materials is 0.88 (approx.)

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Suggestions

- A company should have a well defined system for physical verification of its inventories in place to avoid any discrepancies.
- The movement of inventory should be tracked and only the adequate level of inventory should be maintained in order to avoid any stagnation of funds in inventory.

X CONCLUSION

After the study, we are able to conclude that a company should have a proper and well-functioning inventory management system to improve the effectiveness of its functions. The Management should ensure that the company has the efficiency to avoid minor problems. The management should have adequate control, plan and vigilance when handling its inventory.

References

1. Prem Kumar and Asit K Gosh; 1991; Production Management (Volume 5); Anmol Publishers; ISBN 8170413591.
2. Sudhindra Bhat; 2008; Financial Management; Principles and Practice; Excel Book Publishers; ISBN 8174465863.
3. www.investopedia.com
4. www.moneycontrol.com
5. www.iocl.com