



A correlation study on inventory management and profitability of Coal India LTD

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Abstract

This paper analyzed about the relation between inventory ratio and profitability ratio of Coal India Ltd. Objective of the study is to find is there any relationship exists between inventory and profitability. Time period of the study is ten years from 2014-15 to 2023-24. As an accounting tool ratio analysis has been used. For correlation analysis coefficient of correlation has been used. Inventory turnover ratio, Net Profit ratio, Return on equity and Return on Assets ratios were used in the study. Finding of the study is that between inventory ratio and profitability ratio negative correlation exists during the study period.

Keywords: Inventory, profitability, Coal India Ltd, inventory turnover ratio, net profit ratio, return on equity, return on assets

Introduction

Coal and Coal industry in India

Since 1774, commercial coal mining has been practiced in India. The introduction of steam locomotives in 1853 boosted the industry, allowing it to produce an annual average of 1 million tonnes. After the First World War, however production fell, reaching 29 metric tonnes in 1942 and 30 metric tonnes in 1946. With an annual production of 33 metric tonnes, India started five-year development plans after gaining independence. The National Coal Development Corporation a Government of India initiative was founded in 1956 as a result of the perceived need for effective coal production. This was the first major step towards the planned development of the Indian coal industry. There were two government coal companies in India as well. The Singareni Collieries Company Ltd. was founded in 1945 and came under the jurisdiction of the Andhra Pradesh government in 1956. The Government of Andhra Pradesh and the Government of India now jointly operate SCCL.

(Ministry of Coal) Domestic consumption demands, especially for the steel industry, have been the main driver of commercial coal mining in India. However, the lack of capital investment by private coal mine owners to meet the nation's energy needs resulted in subpar working conditions and unscientific practices. In 1971-72 and 1973, the Central Government made the decision to nationalize private coal mines. Public interest in the management of coking coal mines and coke oven plants was established by the Coking Coal Mines (Emergency Provisions) Act, 1971. Under the Coking Coal Mines (Nationalization) Act of 1972, all coking coal mines and coke oven plants were nationalized under the Bharat Coking Coal Limited (BCCL), with the exception of those owned by Tata Iron & Steel Company Limited and Indian Iron & Steel Company Limited. The government's authority to oversee coking and non-coking coal mines in seven states, including the coking coal mines that were taken over in 1971, was expanded by the Coal Mines (Taking over of Management) Act, 1973. All of these mines were nationalized by the Coal Mines (Nationalization) Act of 1973, which now determines who is eligible to mine coal in India.

Inventory Management

All the components of the supply chain come together in inventory management. Customers may become dissatisfied

if there is insufficient inventory available when and where it is needed. However, a large inventory comes with its own set of risks, including the expense of storage and insurance, as well as the possibility of damage, theft, and spoiling. Businesses with intricate manufacturing and supply chains need to strike the correct balance between having too much and too little inventory on hand.

The following are the fundamental steps in inventory management:

1. **Buying inventory:** Products that are ready to sell are bought and sent either straight to the point of sale or to the warehouse.
2. **Storing inventory:** inventory is kept in storage until it is required. Until they are prepared for shipping, materials or goods are moved throughout your fulfillment network.
3. **Making money off of inventory:** The quantity of goods available for purchase is managed. Orders are filled by pulling finished goods. Customers receive their products.

Profit and Profitability

The money that remains in your company's account after all costs have been paid is known as profit. It is obtained by subtracting production, delivery, and operating expenses from the sale of goods or services. Profit is not the same as revenue or cash. Sales income without expense reduction is referred to as revenue. Cash represents the amount of money that is currently in your business account.

The ability of a business to make money in relation to its costs is measured by its profitability. A company is considered profitable when its revenue growth exceeds its expenses and operating costs. Organizations that don't generate enough revenue are deemed unprofitable and need to change their business practices to turn a profit.

Review of Literature

(Panigrahi, 2013) [8] This study looks into how inventory management techniques affect the effectiveness of working capital in cement companies in India. It looks at the correlation between gross operating profit and inventory conversion period over the 2001-2010 timeframe.

Regression analysis is used in the study to control for factors like firm size, financial debt ratio, and current ratio in order to ascertain how the inventory conversion period affects gross operating profit. The findings indicate an inverse relationship between profitability and inventory conversion period, with a significant negative linear relationship between the two. A longer inventory conversion period results in lower firm profitability, whereas a lower financial debt ratio results in higher profitability. Profitability and firm size are positively correlated, but the current ratio is negatively correlated.

(Gołaś, 2020) [7] This study uses panel data methodology to investigate the relationship between inventory performance and profitability in Polish food companies. It looks at the inventory mix, which includes commodities, work-in-progress, finished goods, and raw materials. According to the results, inventory management efficiency improved while total and current asset inventories decreased between 2005 and 2017. Due to lower days in inventory ratios for materials and completed goods, the study also discovered shorter days in inventory sales. Financial performance, as indicated by return on operating assets, is positively correlated with more effective inventory management.

(Prof. Prayag P. Gokhale, 2018) [9] Inventory control is essential to a company's daily operations because it keeps the right amount of goods on hand at the right time. It accounts for a sizable amount of current assets and is a crucial decision factor in the production, distribution, and sales of products. The profitability of an organization can be adversely affected by either excessive or insufficient inventory. The effective use of raw materials and spare parts in the manufacturing of final goods is the main focus of inventory management, a functional area of finance and production. Reducing excess inventories can increase profitability, while neglecting inventory management can result in a company's demise. Concepts, control strategies, costs, storage inventory, economical order quantities, stock levels, shortage costs, and inventory methods are all covered in this essay.

(Tella, 2023) [10] The study looked at how inventory cost control affected Nigerian manufacturing companies' profitability. It was discovered that while finished goods had a significant positive impact on profit after taxes, raw materials had a negligible positive impact. There was no discernible adverse effect from work in progress. Based on the subset of inventory cost that was examined, the study found that the relationship between inventory cost and profitability varied, with finished goods having the biggest influence. The results advise careful inventory cost control, frequent stock taking to cut down on unnecessary expenses, and automation of inventory management processes to boost productivity and accelerate financial and operational performance.

Objective of the Study

To evaluate the inventory and profitability standing of Coal India ltd and find a relationship between inventory management and profitability

Research Methodology

- **Sample Selection:** Sample of the study has been selected with non-probability sampling technique. So, the sample of the study is Coal India Ltd.

- **Time Period of the study:** From 2014-15 to 2023-24 has been the time period of the study

Hypothesis of the study

H1: There is no significant relationship between inventory ratio and profitability ratio of Coal India Ltd

H2: There is a significant relationship between inventory ratio and profitability ratio of Coal India Ltd.

Financial Ratios used in the study

- Inventory Turnover Ratio
- Net Profit Ratio
- Return on Equity
- Return on Assets

- **Statistical tool used in the Study:** To Measure the relationship between Inventory ratio and profitability ratio Correlation Analysis has been used.

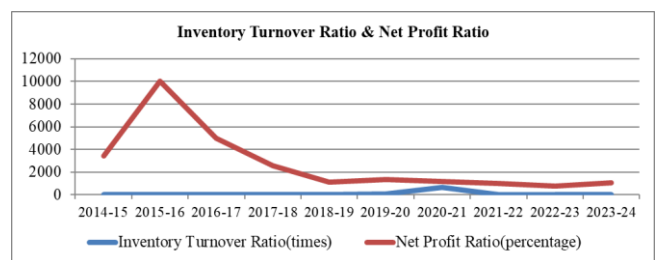
Data Analysis and Interpretation

1. Inventory Turnover Ratio and Net Profit Ratio

Year	Inventory Turnover Ratio(times)	Net Profit Ratio(percentage)
2014-15	6.64	3457.16
2015-16	1.09	10024.16
2016-17	4.24	5001.75
2017-18	17.04	2549.63
2018-19	30.46	1120.58
2019-20	56.42	1334.76
2020-21	640.25	1193.29
2021-22	1.36	989.60
2022-23	0.73	758.89
2023-24	0.15	1039.76

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Graphical Presentation



Analysis and Interpretation: From the above table and graph it is identified that Inventory Turnover ratio has increasing trend from 2014-15 to 2020-21, after then it started falling and reached to lowest 0.15 times in 2023-24, While Net profit ratio has mixed trend during the study period. Maximum inventory turnover was in the year 2020-21 640.25 times while maximum Net profit ratio was in 2015-16 10024.16%.

Correlation between Inventory Turnover ratio and Net Profit ratio

Variables	Inventory Turnover Ratio	Net Profit Ratio
Inventory Turnover Ratio	1	
Net Profit Ratio	-0.2135594	1

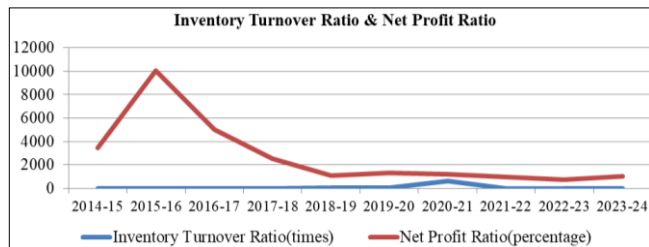
From the above Correlation coefficient value of 'r' is -0.2135 which means that there is a weak negative correlation between variables. Here null hypothesis is rejected it means there is a significant relationship between Inventory Turnover Ratio and Net profit ratio of Coal India ltd.

2. Inventory Turnover Ratio Return on Equity Ratio

Year	Inventory Turnover Ratio(times)	Return on Equity Ratio(percentage)
2014-15	6.64	79.97
2015-16	1.09	103.41
2016-17	4.24	104.17
2017-18	17.04	73.20
2018-19	30.46	74.79
2019-20	56.42	67.09
2020-21	640.25	45.60
2021-22	1.36	68.47
2022-23	0.73	88.60
2023-24	0.15	91.00

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Graphical Presentation



Analysis and Interpretation: From graphical presentation and above table it is identical that Return on equity ratio has fluctuating trend while Inventory Turnover ratio has increasing trend in starting period after then it went to downwards. Maximum return on equity was 104.17% in the year 2016-17 while minimum is 45.60% in the year 2020-21.

Correlation between Inventory Turnover ratio and Return on Equity ratio

Variables	Inventory Turnover Ratio	Return on Equity Ratio
Inventory Turnover Ratio	1	
Return on Equity Ratio	-0.7055195	1

Here the value of correlation coefficient 'r' is -0.7055, it shows the moderate negative correlation between the variables. So here alternative hypothesis is accepted that

Variables	Value of correlation coefficient 'r'	Type of Correlation	Result
Inventory Turnover Ratio and Net Profit Ratio	-0.21355594	Weak Negative	H0 Rejected
Inventory Turnover Ratio Return on Equity Ratio	-0.7055195	Moderate Negative	H1 Accepted
Inventory Turnover ratio and Return on Assets ratio	-0.70664	Moderate Negative	H0 Rejected

Findings of the Study

- It is concluded that there is a weak negative correlation between Inventory turnover ratio and Net Profit ratio during the study period of 2014-15 to 2023-24 of Coal India ltd.
- There is a moderate Negative Relation between

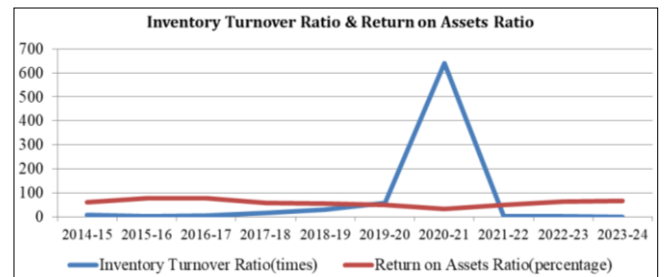
there is a significant relationship between inventory turnover ratio and Return on Equity Ratio of Coal India Ltd.

3. Inventory Turnover Ratio and Return on Assets Ratio

Year	Inventory Turnover Ratio(times)	Return on Assets Ratio(percentage)
2014-15	6.64	60.42
2015-16	1.09	77.61
2016-17	4.24	76.77
2017-18	17.04	56.33
2018-19	30.46	54.98
2019-20	56.42	50.36
2020-21	640.25	33.95
2021-22	1.36	49.91
2022-23	0.73	63.17
2023-24	0.15	65.57

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Graphical Presentation



Analysis and Interpretation

As per the above two ratios here also Return on Assets Ratio has mixed trend during the study period from 2014-15 to 2023-24. Individually in the year 2015-16 with 77.61% was highest during ten-year study period while with 33.95% minimum was in the year 2020-21.

Correlation between Inventory Turnover ratio and Return on Assets ratio

Variables	Inventory Turnover Ratio	Return on Assets Ratio
Inventory Turnover Ratio	1	
Return on Assets Ratio	-0.70664	1

Here Correlation coefficient 'r' value is -0.7066 which means moderate negative correlation exists between the variables. That's why here Null hypothesis is rejected means there is a significant relationship between Inventory turnover ratio and Return on Assets Ratio of Coal India ltd.

Result of the Study

Variables	Value of correlation coefficient 'r'	Type of Correlation	Result
Inventory Turnover Ratio and Net Profit Ratio	-0.21355594	Weak Negative	H0 Rejected
Inventory Turnover Ratio Return on Equity Ratio	-0.7055195	Moderate Negative	H1 Accepted
Inventory Turnover ratio and Return on Assets ratio	-0.70664	Moderate Negative	H0 Rejected

Inventory turnover ratio and Return on Equity ratio of Coal India ltd during the study period.

- Between the Inventory turnover ratio and Assets turnover ratio also moderate negative correlation existed during the study period from 2014-15 to 2023-24 of Coal India ltd.

So, from the above analysis and interpretation it can be said that there is a relationship between the inventory ratios and profitability ratios of Coal India Ltd during the ten-year study period from 2014-15 to 2023-24.

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