Journal of Informatics Education and Research
ISSN: 1526-4726
Vol 5 Issue 2 (2025)

An Empirical Assessment of the Financial Performance of Selected Indian Steel Companies: Focussing on Liquidity, Solvency, Efficiency and Profitability

Dr. Rahul Pal
Subject Expert, Dept. of Business Administration
DDU Gorakhpur University, Gorakhpur

Dr. Maneesh Kumar
Assistant Professor, Dept. of Commerce
DDU Gorakhpur University, Gorakhpur

Dr. Anshika Mishra
Assistant Professor, Dept. of Commerce
DDU Gorakhpur University, Gorakhpur

Abstract:
This research evaluates expressive backgrounds in natural situations and develops a standardized statistic. The fundamental reason for the study is because the country's iron and steel industry is currently facing a slight downturn, and the government is doing everything it can to bring the industry back on track to becoming the world's second-largest producer of steel once again.Four Indian steel companies' ten year financial performance from 2011-12 to 2020-21 is examined in this study; financial statements from four steel companies were analyzed (Four major Indian steel producers: Tata Steel, SAIL,JSW and Visa Steel). Data were analyzed using descriptive statistics, the ANOVA test, and other financial ratio analyses to determine the influence of liquidity on profitability.

Keywords:
Steel Companies, Financial Performance, Financial Statements, Iron and steel sector

Introduction:
A contemporary economy cannot function without steel, which is often considered as the foundation of human civilisation. Steel consumption per capita is a major indication of a country's socio-economic advancement and level of living. It derives from a wide and technologically complex industry with strong forward and backward material flow and income generating ties. A strong steel sector defines major industrial economies, and the track of many of these economies has been greatly influenced by the strength of their steel industries during the formative eras of their existence.As one of the most vital core sectors of an economy, the iron and steel industry is a leading indication of a country's economic strength and overall national strength. Steel and iron are key components of the Indian economy and play a critical part. India's iron and steel sector, which is massive in scale, plays a critical role in the country's industrial system. Additionally, given the steel and iron industry's role in stimulating the growth of allied industrial sectors and sectors focused toward supporting the steel and iron industry (such as research and trade), the industry contributes more to indirect employment creation. Steel and

iron are vital for economic development and prosperity since they contribute to regional economic growth and social stability. **(Arab et al., 2015)**

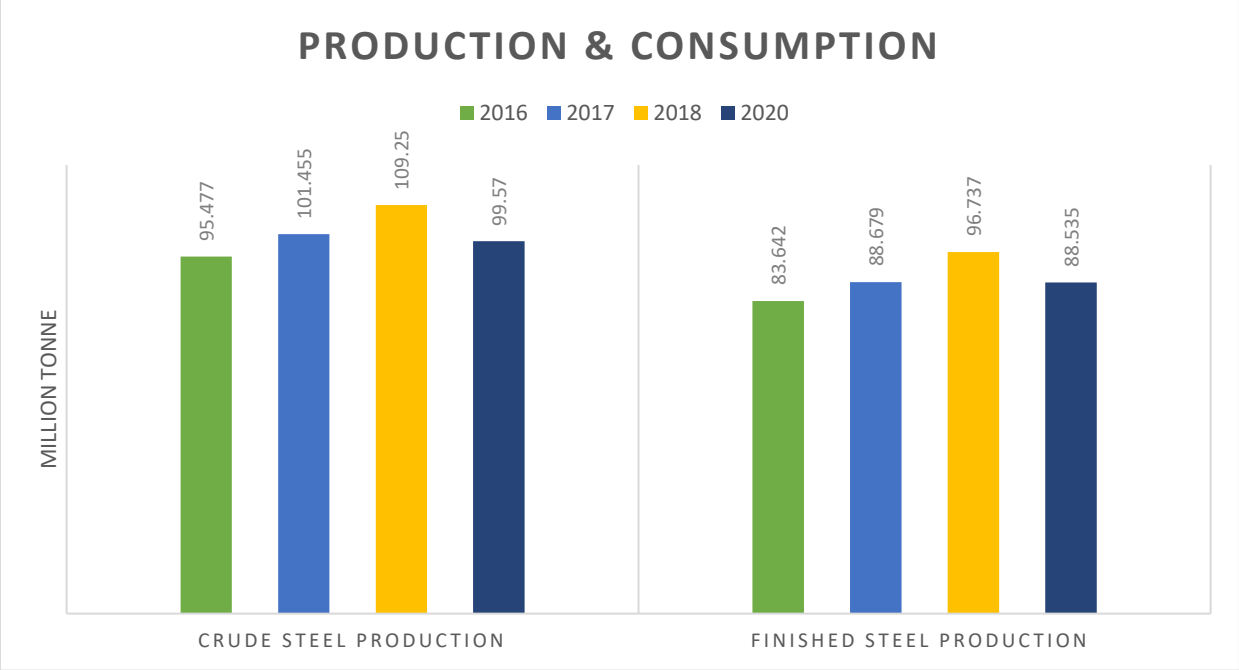
With a total production of 9.8 million tonnes, India was the world's second-largest producer of crude steel. In fiscal year 2020, crude steel production totaled 102.49 million tonnes (MT), while finished steel production totaled 94.66 million tonnes (MT)). India's crude steel output is expected to increase by 18 percent to 120 million tonnes in fiscal year 22 (FY22), resulting in increased consumer demand. The rise of the Indian steel industry has been spurred by the availability of raw materials such as iron ore and economical labour in the surrounding area. As a result, India's steel industry has made major contributions to the country's manufacturing output. India's steel industry is highly advanced, with steel facilities that are state-of-the-art in their operations. It has always attempted to improve the energy efficiency of older units by modernising and upgrading them on a continuous basis as technology progresses.

Infrastructure projects development (43 percent), engineering and packing (22 percent), automotives (9 percent), defence (9%), and other growth-oriented industries use a significant amount of steel in their operations (1 percent). There were 100.2 million tonnes of steel utilised in the United States in fiscal year 2020. There has been a CAGR of 5.3 percent over the past seven years in the demand for steel in the United States. On the other hand, India consumes 74.1 kilogrammes of steel per person annually (JPC Extract from Annual Statistics 2018-19), or about a third of the global average (224.5 kilogrammes) (Source: World Steel Association, 2019). India's rural per capita consumption, at 19 kg per year, is significantly lower than the national average consumption rate. Several sectors have a lot of room to grow their use of steel.
Below is a five-year (2016-2020) breakdown of total Finished Steel (alloy + non-alloy) production, consumption, imports, and exports, as well as crude steel production:

(in a million tonne)

Item	2016	2017	2018	2019	2020
Crude Steel					
Production	95.477	101.455	109.250	111.344	99.570
Finished Steel					
Consumtion	83.642	88.679	96.737	102.622	88.535
Import	8.430	7.828	7.295	7.440	4.463
Export	5.902	10.871	6.692	8.205	10.150

Source: *JPC (Joint Plant Committee) steel.gov.in*



The steel industry in India is classified into **three** main segments: **major producers, primary producers, and secondary producers**.

Literature Review

Smaller cash conversion cycles may improve a company's profitability, according to **Garcia-Teruel and Martinez-Salano, (2004)**, who studied 8872 small and medium-term Spanish businesses.

Eljelly (2004) examined the connection between profitability and liquidity, finding that the cash conversion cycle was an important indicator of liquidity and the current ratio was a factor in profitability.

A study by **Shah and Sana (2006)** examined the relationship between working capital and the oil and gas industry from 2001 to 2005 using a sample of seven companies. With this information, companies may expect to see a positive return on their working capital.

It was chosen by **Ganesan (2007)** as a testing ground for working capital management in the telecommunications equipment business. From 2001 to 2007, the financial results of 349 different telecom equipment manufacturers were examined. Correlation and regression analyses were employed in the research. Researchers have claimed that working capital days negatively impact the profitability of enterprises, although, in reality, it does not affect the transportation of industry.

When **SushmaVishnani and Bhupesh Kr. Shah (2007)** studied the Indian consumer electronics market in 1994–95 and 2004–05. They found that working capital had a significant effect on

profitability. According to their findings, working capital and profitability are linked unfavorably for most organizations.

In his research, **Dong (2010)** found that organizations' profitability and liquidity were inflated due to inefficient working capital management. From 2006 to 2008, he analyzed data from the Vietnamese stock market's enterprises. His goal was to discover the profitability adaptation cycle, its related fundamentals, and their relationship. The idea also came from the fact that the relationships between these variables are pretty unwanted. His research signifies that the company's profitability has been reduced due to the high cash conversion cycle.

According to **Sharma and Kumar (2011)**, the positive link and origin between accounts receivables and profitability are because Indian enterprises must retain extra trade credit to resist the presence of their global participants.

As part of their research, **Bagchi and Bhasker (2012)** studied the effects of working capital policies, such as the Cash Conversion Cycle, the Inventory Conversion Period, and the like, on the profitability of FMCG firms. Businesses are judged on their capacity to generate Return on Total Assets (or ROTA) and Return on Investment (ROI). The company's liquidity and profitability are influenced by its working capital strategy.

Working capital policies are examined in terms of profitability and liquidity by **Sandhar (2013)**. Maintaining liquidity is essential to take advantage of new business prospects and keep a firm foothold on the difficulties.

The Liquidity management of cement businesses was studied by **Ashok, P (2013)**, utilizing the various methodologies of mean, standard deviation, coefficient of variation, and ratio analysis to examine the data. He observed that the liquidity of small firms is better than that of larger organizations. However, the development rate of the current ratio, quick ratio, and working capital to current assets of all businesses is unsatisfactory, which indicates an unstable liquidity situation.

Pal investigated the financial performance of Indian steel companies throughout the globalisation era. The purpose of this research was to examine the financial performance of Indian steel firms and to establish a linear relationship between liquidity, leverage, efficiency, and profitability. The period 1991-1992 to 2010-2011 is utilised to choose Indian steel companies for the study based on their market share in 2008-09. Except for Tata Steel, all of these businesses are publicly traded, with the exception of JSW Steel and Rashtriya Ispat Nigam, which are the only private sector firms with a major market share in the country's steel manufacturing. We sought to quantify the influence of numerous variables on profitability using multiple regression analysis and model projections.

Objectives of the study

1. This study examines companies' liquidity, solvency, activity, and profitability in India's steel sector.
2. This research looks at the relationship between different liquidity and profitability ratios.

Research Methodology

The research is mainly concerned with expressive in natural settings and uncovers a common statistic. Financial statements from Indian steel companies (Tata Steel, Steel Authority of India Ltd., JSW Steel, and Visa Steel) were utilized from books, journals, and other websites. The acquired data were analyzed using ANOVA to determine the statistical difference between selected Indian steel firms' financial ratios. The research covers secondary data for ten years, from 2011-12 to 2020-21.

The hypothesis of Study: The following hypotheses are framed and tested.

H_0 1: There is no significant variation in the financial performance of selected steel businesses in India in terms of liquidity.

H_0 2: There is no significant variation in the financial performance of selected steel businesses in India in terms of solvency.

H_0 3: There is no significant variation in the financial performance of selected steel businesses in India in terms of efficiency.

H_0 4: There is no significant variation in the financial performance of selected steel businesses in India in terms of profitability.

Materials and Methods

Source of Data: The research relies on secondary sources, such as the annual reports of various steel firms, books and publications, journal articles, and information found on the internet. The steel industry analysis covers ten years from 2011-12 to 2020-21.

Sampling -: More than 200 steel companies are publicly traded on the Indian stock markets, of which five are A group corporations that produce steel. This research will be conducted on all five of these businesses. These four firms have been chosen: Tata Steel, Steel Authority of India, JSW Steel, and Visa Steel.

Data Analysis: ANOVA is used to analyse data. The test is conducted on twelve financial ratios (variables) selected from various segments such as liquidity, solvency, activity, and profitability, including the current ratio, the quick ratio, the total asset to debt ratio, the proprietary ratio, the interest coverage ratio, and total asset turnover, debtor turnover, creditor turnover, and gross profit margin.

Analysis of Data

Liquidity Ratios: The term "Short-term Solvency Ratios" is another way of referring to the liquidity ratio. The capability of a business to meet its short-term commitments (usually one year) and demonstrate its ability to maintain a positive cash flow is characterised as "liquidity." **(Khan & Jain)**. Liquidity is a necessary condition for a business's existence. Liquidity, on the other hand, should not be excessive or lacking.Due to a shortage of liquidity, a company's creditworthiness and the faith of its creditors would suffer if it fails to satisfy its present obligations. Again, a high level of liquidity suggests that assets are lying inactive and earning nothing. High and low liquidity must be balanced to achieve effective financial management and maximize profit **(Pandey)**.

The essential liquidity ratios are as follows : (i) current Ratio, (ii) acid-test ratio or quick ratio, and (iii) absolute Liquidity Ratio.

H_0 1 : There is no significant variation in the financial performance of selected steel businesses in India in terms of liquidity.

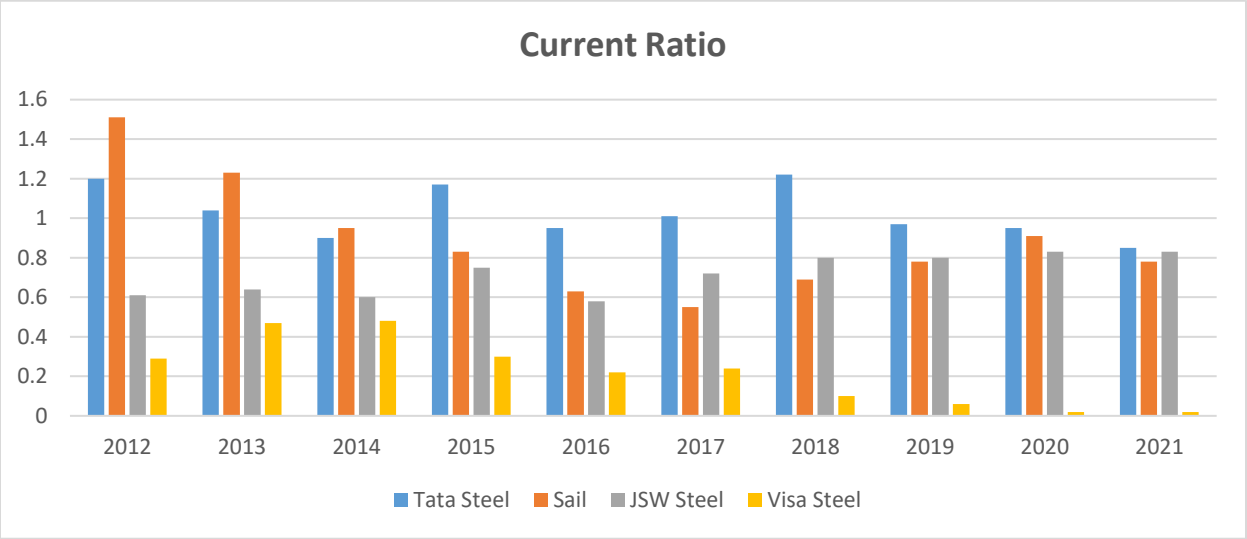


Figure 1. Current Ratio of Tata Steel, Sail, JSW Steel, and Visa Steel

Table 1. -: ANOVA table of Current Ratio

ANOVA						
Source of variation	SS	df	MS	F	p-value	F crit
Between Groups	3.70952	3	1.236506667	35.39843501	0.0000	2.866265551
Within Groups	1.25752	36	0.034931111			
Total	4.96704	39				

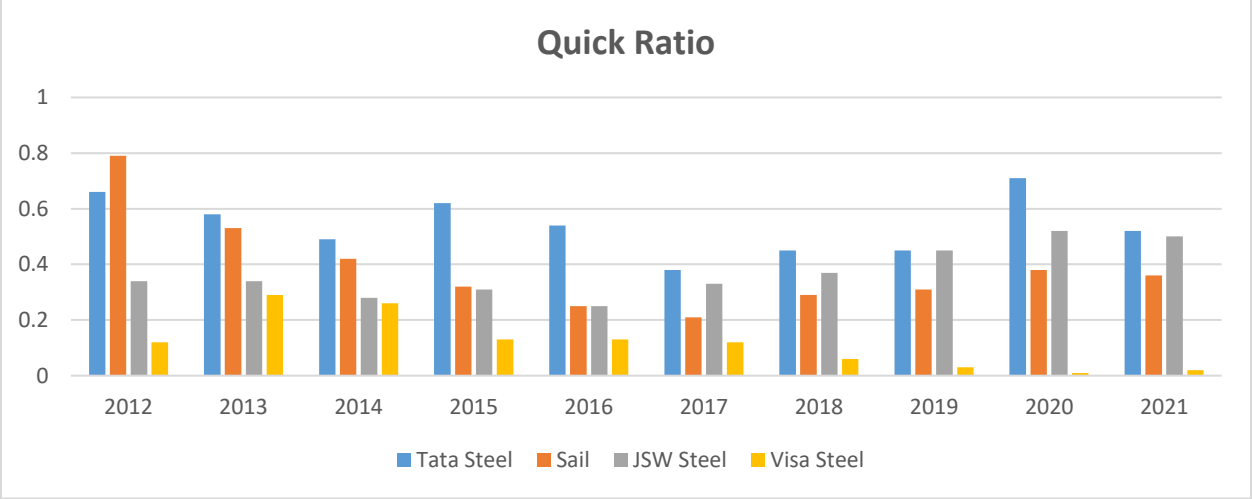


Figure 2. Quick Ratio of Tata Steel, Sail, JSW Steel, and Visa Steel

Table 2 -: ANOVA table of Quick Ratio

ANOVA						
source of variation	SS	df	MS	F	p-value	F crit
Between Groups	0.9201	3	0.3067	21.72010859	0.0000	2.866265551
Within Groups	0.50834	36	0.014120556			
Total	1.42844	39				

Results of the liquidity ratio study are shown in Tables 1 and 2.
Because the one-way ANOVA test has a significance threshold of less than 0.05, there is a significant difference between firms' current and quick ratio financial performance.
A significant difference in the financial performance of identified Indian steel industry companies is accepted as an alternative to the null hypothesis that no significant difference exists between the financial performance of those companies in terms of their liquidity position, and this alternative hypothesis is rejected.

Solvency Ratios: "Solvency" refers to a business's capacity to meet its financial obligations. Financial institutions, holders of debentures, and creditors who sell goods on an instalment basis are all included in the definition of long-term indebtedness for businesses. Long-term creditors want to know if a business can dependably pay interest on long-term borrowings, refund any difference in financial performance between various units, and assure that the money they lent will be returned when the loan period ends. As a consequence, long-term solvency ratios represent a company's ability to pay long-term interest and charges, as well as repay long-term debt.This section uses various financial and statistical methods to gauge the paper mills' long-term solvency **(Subramanian, 2009)**. To determine a business's long-term financial stability, the following ratios are calculated: (i) debt-equity Ratio, (ii) total assets to debt ratio, (iii) proprietary ratio, and (iv) interest coverage ratio (ICR).

H_0 2 : There is no significant variation in the financial performance of selected steel businesses in India in terms of solvency.

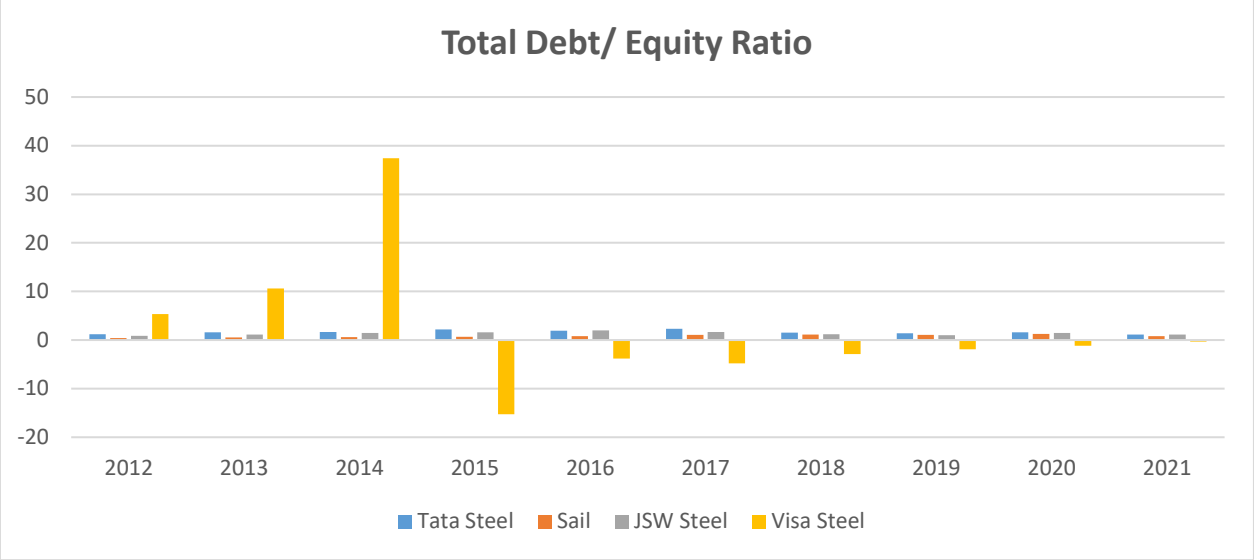


Figure 3. Total Debt/Equity Ratio of Tata Steel, Sail, JSW Steel, and Visa Steel

Table 3 -: ANOVA table of Total Debt /Equity Ratio

ANOVA

Source of variation	SS	Df	MS	F	p-value	F crit
Between Groups	11.64211	3	3.8807025	0.078679	0.971148	2.866266
Within Groups	1775.645	36	49.32346917			
Total	1787.287	39				

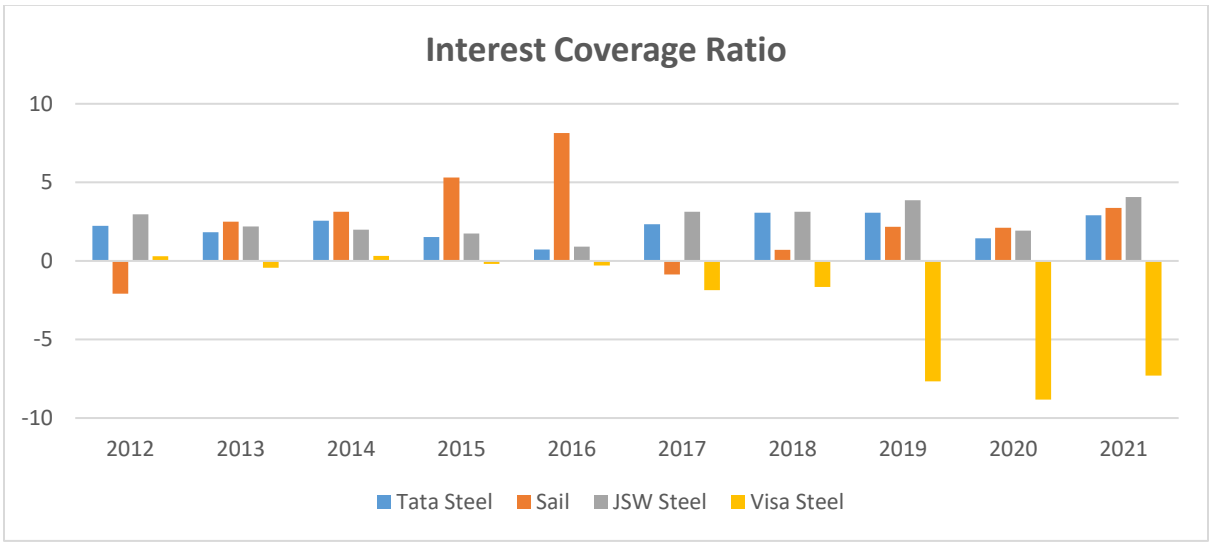


Figure 4. Interest Coverage Ratio of Tata Steel, Sail, JSW Steel, and Visa Steel

Table 4 -: ANOVA table of Interest Coverage Ratio

ANOVA						
Source of variation	SS	df	MS	F	p-value	F crit
Between Groups	200.9563	3	66.9854225	11.41513	0.0000000271	2.866266
Within Groups	211.2526	36	5.868126944			
Total	412.2088	39				

With a significance level of one-way ANOVA test greater than 0.05, it is clear from Table 3 that the total debt/equity ratio does not affect company financial performance.
Table 4 exhibits One-way ANOVA results showing a statistically significant difference in the financial performance of organizations when it comes to Interest Coverage Ratio (ICR).
Thus, the null hypothesis is rejected and the alternative hypothesis is accepted. The financial performance of recognised units in India's steel business varies significantly in terms of solvency. As a result, we reject the null hypothesis.

Activity ratios: This ratio is often referred to as the activity ratio, turnover ratio, or efficiency ratio. Due to the fact that activity ratios are used to measure a business's efficiency in managing its assets, they are also known as efficiency ratios or asset utilisation ratios. In general, the greater the turnover or conversion rate, the more efficient the asset utilisation, all other variables being equal. As a consequence, these ratios are referred to as "turnover ratios" on occasion. Thus, an activity ratio is a metric that is used to determine the relationship between a business's sales (or cost of sales) and its multiple assets. **(Khan & Jain)**. Additionally, such ratios indicate if a firm's present and long-term asset investments are too large or excessively little. Calculated turnover ratios include the following: (i) turnover of total assets, (ii) turnover of inventory, (iii) turnover of debtors, and (iv) turnover of creditors.
H_0 3: There is no significant variation in the financial performance of selected steel businesses in India in terms of efficiency.

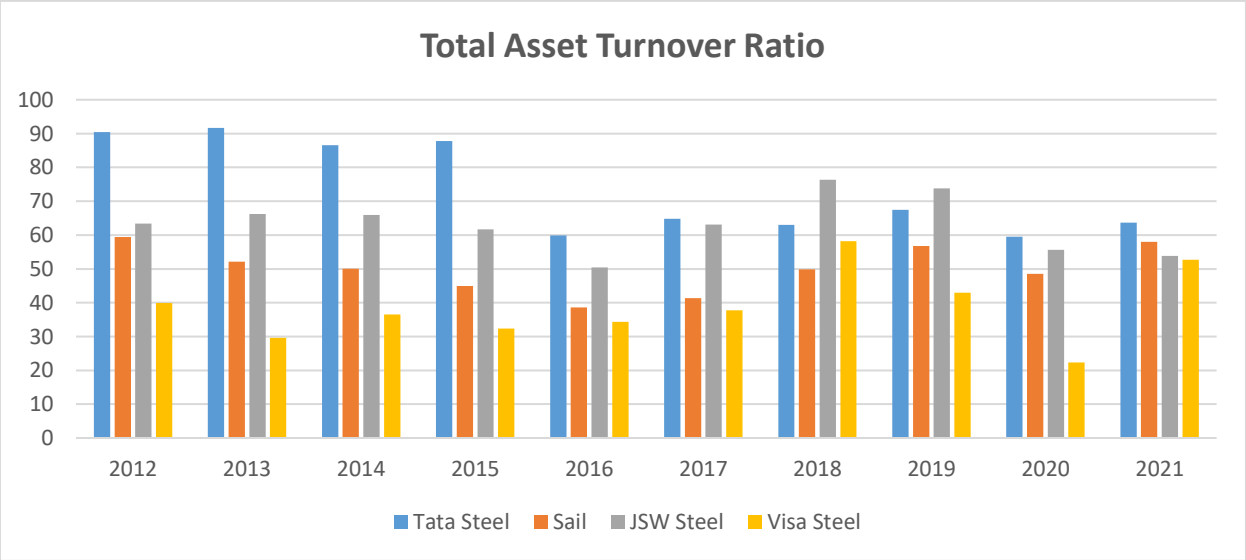


Figure 5. Total Asset Turnover Ratio of Tata Steel, Sail, JSW Steel, and Visa Steel

Table 5 -: ANOVA table of Total Asset Turnover Ratio

ANOVA						
Source of variation	SS	df	MS	F	p-value	F crit
Between Groups	6916.127	3	2305.376	22.11533	0.0000000271	2.866266
Within Groups	3752.76	36	104.2433			
Total	10668.89	39				

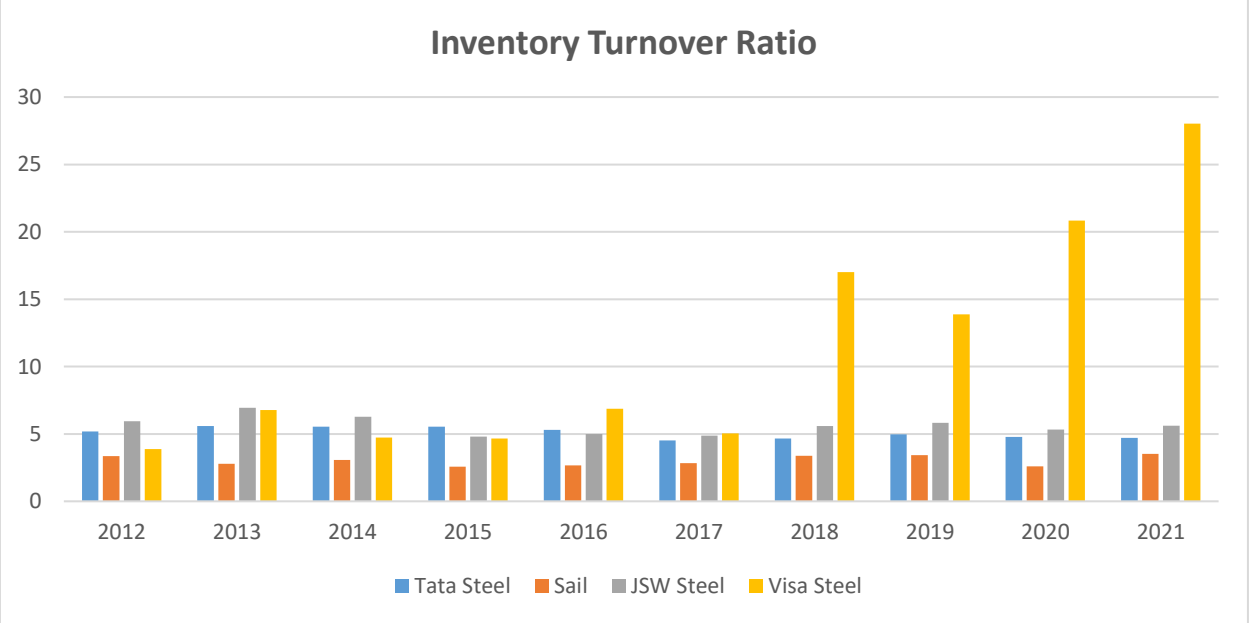


Figure 6. Inventory Turnover Ratio of Tata Steel, Sail, JSW Steel, and Visa Steel

Table 6 -: ANOVA table of Inventory Turnover Ratio

ANOVA						
Source of variation	SS	df	MS	F	p-value	F crit
Between Groups	363.9764	3	121.3255	6.838629	0.000917	2.866266
Within Groups	638.6832	36	17.7412			
Total	1002.66	39				

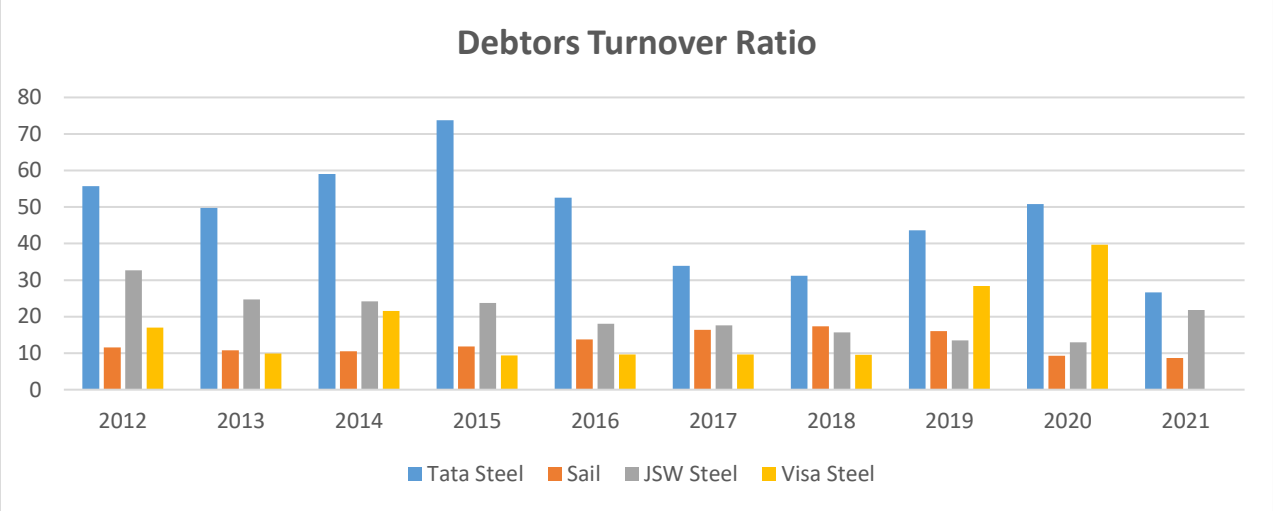


Figure 7. Debtors Turnover Ratio of Tata Steel, Sail, JSW Steel, and Visa Steel

Table 7 -: ANOVA table of Debtors Turnover Ratio

ANOVA						
Source of variation	SS	df	MS	F	p-value	F crit
Between Groups	7771.512	3	2590.504	26.94856	0.00000000257	2.866266
Within Groups	3460.598	36	96.12772			
Total	11232.11	39				

The following tables summarize activity ratios' examination findings: 5,6, and 7.
Because the one-way ANOVA test has a significant level of less than 0.05, there is a significant difference in the financial performance of organizations when total asset turnover, inventory turnover ratio, and debtor turnover ratio are included.
Thus, the null hypothesis is there is no significant difference in the financial performance of identified units in the Indian steel industry according to activity position, implying that the alternative hypothesis that there is a significant difference in financial performance of identified units in the Indian steel industry according to activity position is rejected.

Profitability Ratios:
Profitability is a term that refers to a business's ability to produce revenue and sustain growth in both the short and long term. Profitability is a concept that relates to a business's inability to generate revenue and sustain growth in the short and long term. Profitability is crucial for the long-term survival and expansion of a firm. Profitability is vital, and every stakeholder in a firm cares about the financial health and profitability of the organisation.When a company's management is focused on determining its operational efficiency via profitability, shareholders invest their money in the hope of earning an acceptable return. Thus, a company's operational efficiency and capacity to provide acceptable returns to shareholders are ultimately determined by the profits made **(Khan & Jain, 2007)**. The research calculates five profitability ratios: gross profit margin, (ii) net profit margin, (iii) operating profit margin, (iv) return on capital used, and (v) earnings per share.

H_0 4 : There is no significant variation in the financial performance of selected steel businesses in India in terms of profitability.

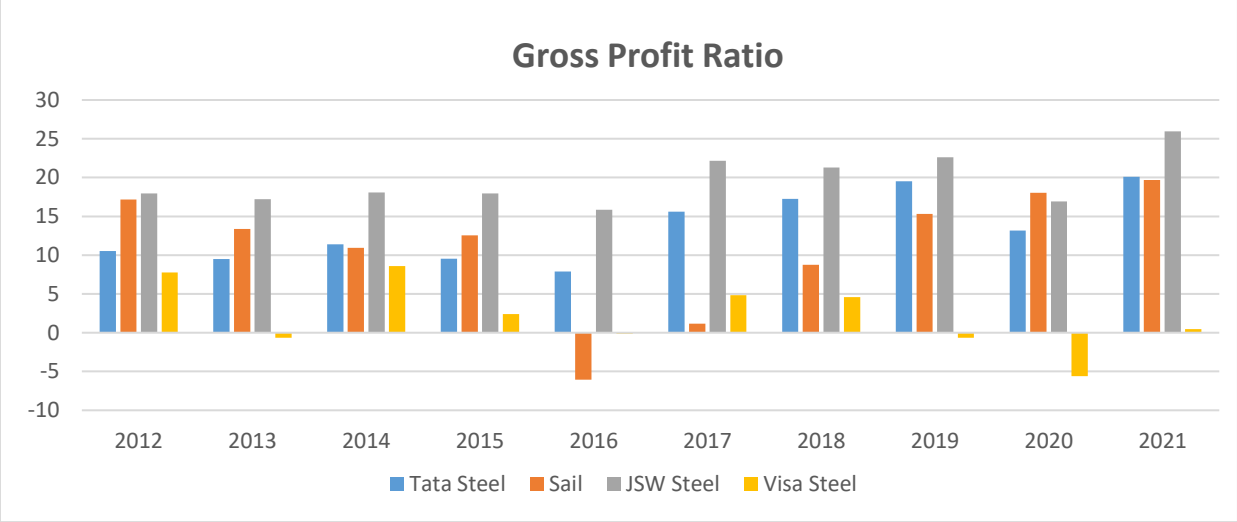


Figure 8. Gross Profit Ratio of Tata Steel, Sail, JSW Steel, and Visa Steel

Table 8-: ANOVA table of Gross Profit Ratio

ANOVA						
Source of variation	SS	df	MS	F	p-value	F crit
Between Groups	1567.823	3	522.6075	18.42841	0.000000206	2.866266
Within Groups	1020.917	36	28.3588			
Total	2588.739	39				

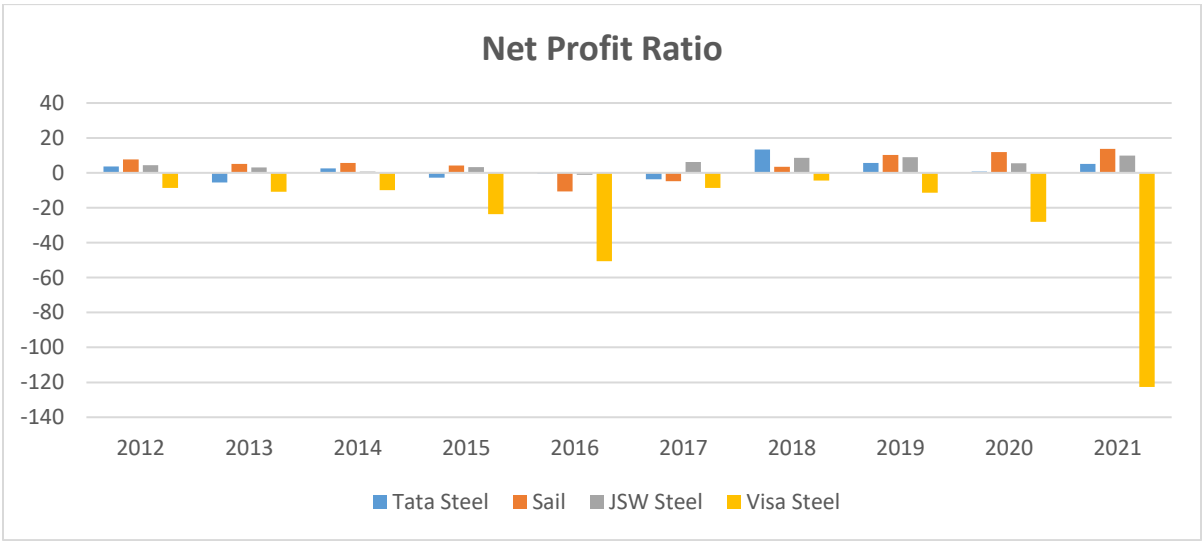


Figure 9. Net Profit Ratio of Tata Steel, Sail, JSW Steel, and Visa Steel

Table 9-: ANOVA table of Net Profit Ratio

ANOVA						
Source of variation	SS	df	MS	F	p-value	F crit
Between Groups	7585.333	3	2528.444	7.235267	0.00064	2.866266
Within Groups	12580.6	36	349.4611			
Total	20165.93	39				

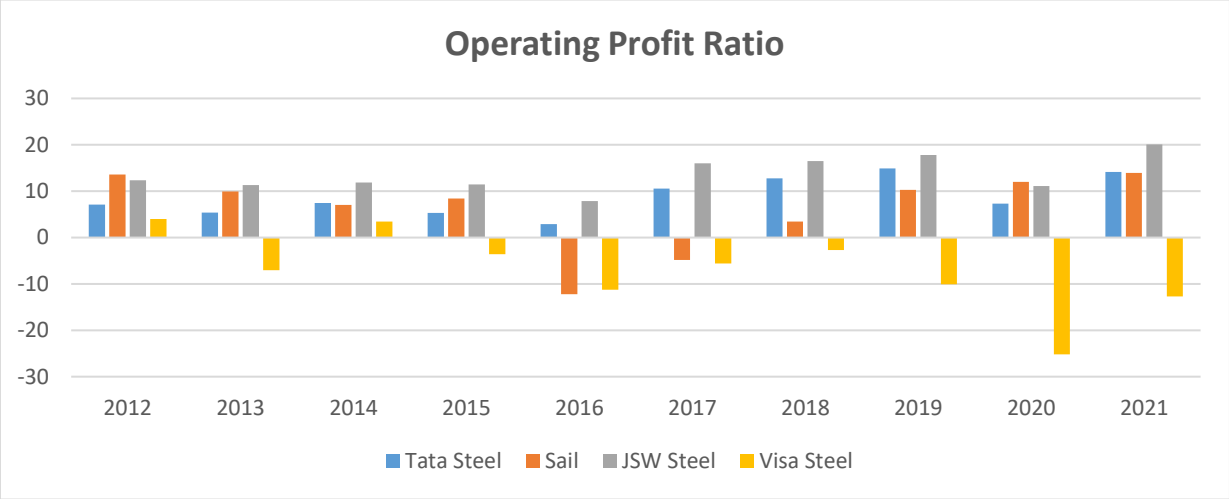


Figure 10. Operating Profit Ratio of Tata Steel, Sail, JSW Steel, and Visa Steel

Table 10-: ANOVA table of Operating Profit Ratio

ANOVA						
Source of variation	SS	df	MS	F	p-value	F crit
Between Groups	2354.786	3	784.9288	17.81212	0.000000206	2.866266
Within Groups	1586.417	36	44.06713			
Total	3941.203	39				

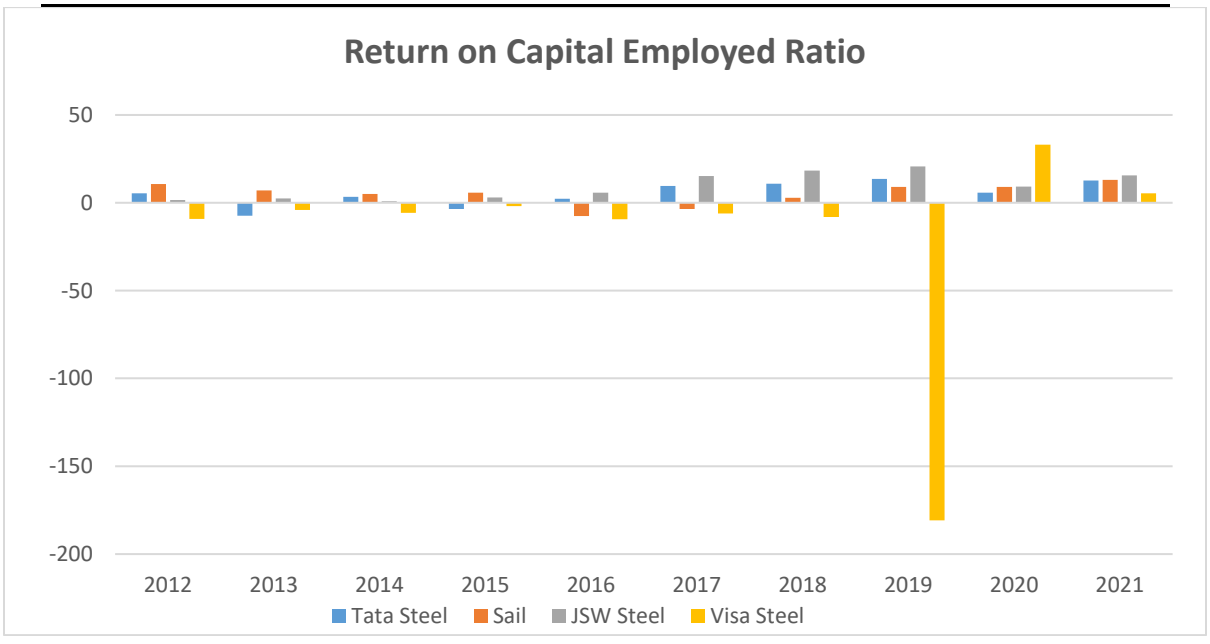


Figure 11. Return on Capital Employed Ratio of Tata Steel, Sail, JSW Steel, and Visa Steel

Table 11-: ANOVA table of Return of Capital Employed

ANOVA						
Source of variation	*SS*	*df*	*MS*	*F*	*p-value*	*F crit*
Between Groups	4893.881	3	1631.294	1.837422	0.157826	2.866266
Within Groups	31961.4	36	887.8166			
Total	36855.28	39				

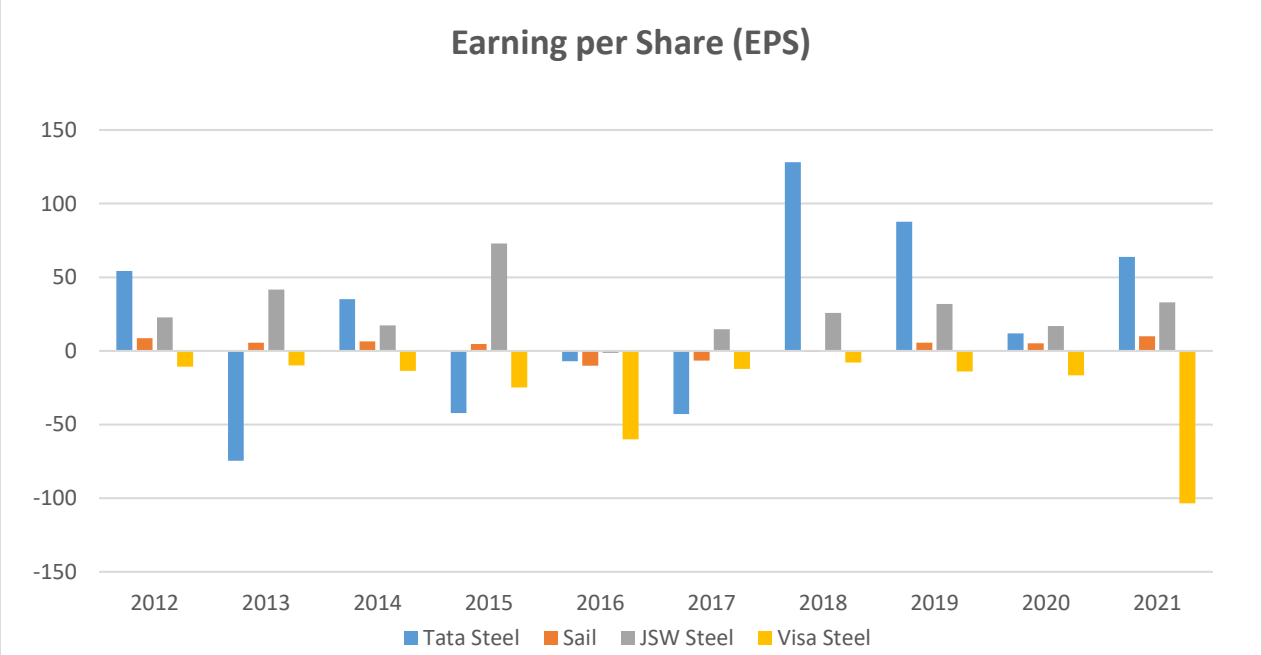


Figure 12. Earnings Per Share of Tata Steel, Sail, JSW Steel, and Visa Steel

Table 12-: ANOVA table of EPS

ANOVA						
Source of variation	SS	df	MS	F	p-value	f crit
Between Groups	18187.34	3	6062.447	4.398282	0.009784	2.866266
Within Groups	49621.22	36	1378.367			
Total	67808.56	39				

Table 8, 9, 10, 11, and 12 displays the result of the profitability ratio analysis.

As the significance level of the One-way ANOVA test is less than 0.05, there is a significant difference in the financial performance of companies regarding Gross Profit Margin, Net profit Margin, Operating Profit Margin, Return on Capital Employed, and earning per share. Therefore, the null hypothesis that there is no significant difference in the financial performance of identified units in the steel industry in India concerning Profitability Position is rejected and

accepts the Alternative Hypothesis that there is a significant difference in the financial performance of identified units in the steel industry in India concerning Profitability Position.

Conclusion

The present study deals with examining the financial performance of selected units in the steel sector in India. In order to analyse the financial performance Liquidity, Solvency, Activity, and Profitability status of the selected units are reviewed. The following ratios were calculated and evaluated in this study: the current ratio, the quick ratio, the total asset to debt ratio, the interest coverage ratio, the total asset turnover ratio, the inventory turnover ratio, the debtor turnover ratio, the gross profit margin, the operating profit margin, the return on capital employed ratio, and the earnings per share (EPS). A one-way ANOVA test is used to examine the hypotheses. Except for the Total Debt/Equity Ratio, all of the null hypotheses have been ruled out. As a result of the research and testing of hypotheses, it was found that the financial performance of selected steel industry units in India differed significantly in terms of liquidity, solvency, activity, and profitability.

Reference

1. Government of India. 2020-21. Annual Report, Ministry of Steel, Government of India, New Delhi
2. Kolluru, S., 2005. A Study of Performance of Indian Steel Companies during 1999 - 2003. The IUP Journal of Applied Economics, 5(4): 51-61.
3. Eljelly, A. (2004). Liquidity-Profitability Tradeoff: An Empirical Investigation in an Emerging Market, International Journal of Commerce and Management, 14(2), 48-61.
4. Patra, S., 2005. Liquidity Vs. Profitability, Indian Journal of Accounting, 35(2): 39-43.
5. Bagchi, B., Chakrabarti, J. & Roy, P. B. (2012). Influence of Working Capital Management on Profitability: A Study on Indian FMCG Companies. International Journal of Business and Management, 7, 1-10
6. Dong H. P. (2010), "The Relationship between Working Capital Management and Profitability."International Research Journal of Finance and Economic. Issue-49.
7. Burange, L.G. and S. Yamini, 2008. The performance of Indian iron and steel industry and competitiveness of the firms, Journal of Indian School of Political Economy, 20(3): 449-458.
8. Barad, M., 2010. A Study of Liquidity Management of Indian Steel Industry, Ph.D. Thesis, Faculty of Commerce, Saurashtra University, India.
9. Ganesan, V. (2007). An analysis of working capital management efficiency in telecommunication equipment industry. Rivier Academic Journal, 3, 1-10.
10. Pal, S., 2012. Comparative study of financial performance of Indian steel companies under globalization, International Journal of Accounting and Financial Management Research (IJAFMR). 2(4): 1-8.
11. Shah, A. & Sana, A. (2006). Impact of Working Capital Management on the Profitability of Oil and Gas Sector of Pakistan. European Journal of Scientific Research. 15(3), 301 - 307.
12. Chavali, K. and S. Karthika, 2012. Application of Z score Analysis in Evaluating Steel Industry in India, Asia Pacific Journal of Research in Business Management, 3(1): 79-94.
13. Sharma, A.K. & Kumar, S. (2011). Effect of Working Capital Management on Firm Profitability: Empirical Evidence from India. Global Business Review, 12(1), 159 – 173.

14. Subramanian, T., 2009. Financial Performance of the Paper Mills in Tamil Nadu. Ph.D. Thesis, University of Periyar, India.
15. Retrieved from URL; https://ijecm.co.uk/wp-content/uploads/2014/01/115.pdf
16. RetrivedfromURL; https://www.researchgate.net/publication/326593326_Financial_Performance_of_Steel_Industry_in_India
17. RetrievedfromURL; https://www.researchgate.net/publication/338208808_Analysis_of_Financial_Performance_A_Study_of_Selected_Pharmaceutical_Companies
18. RetrievedfromURL;https://steel.gov.in/sites/default/files/Annual%20Report Ministry%20of%20Steel%202020-21.pdf
19. https://www.livemint.com/Industry/T5K84J77op9mWEvMmGc6VP/Steel-makers-stuck-with-heavy-debt-negative-cash-flow.html
20. Arab, R. O., Masoumi, S. S., & Barati, A. (2015). Financial Performance of the Steel Industry in India: A Critical Analysis. *Middle-East Journal of Scientific Research*, *23*(6), 1085–1090. https://doi.org/10.5829/idosi.mejsr.2015.23.06.22197
21. Khan, M.Y. and P.K. Jain, 2007. Financial Management, Text, Problems and Cases, Tata McGraw Hill Publishing Company Ltd., New Delhi, 4th ed., 7: 21-22.
22. Pandey, I.M., 2008. Financial Management, Vikas Pub. House Pvt. Ltd., Noida, 9th ed. Reprint, 520.
23. Ravi M. Kishore, Financial Management, 3rd edition, Taxmann Allied Services (P) Ltd., New Delhi, p – 109.