

## An in-depth examination of the financial ratios of metals and mining companies in India

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### Abstract

In the current global context, the metals and mining industry is regarded as one of the major areas of concern. The financial ratios of mining and metals companies in the Indian market are thoroughly examined in this paper. The study aims to shed light on these businesses' stability, performance, and financial health in an unstable economy. Drawing upon a dataset spanning multiple years, various financial ratios are scrutinized, including liquidity ratios, profitability indicators, leverage ratios, and efficiency measures. This paper analyses the comparative financial performance of Indian companies like Jindal Steel, Coal India, Hindalco Industries, Tata Steel, and Bharat Forge during 2020-2023. Various ratios have been used to evaluate the financial health of certain companies. These include the following: leverage, profitability, activity, liquidity, and market value. The result demonstrates that Coal India has the strongest current ratio, indicating strong short-term financial strength. From 2020 through 2023, Hindalco Industries generated more earnings per share of their shareholder's investment than others. However, the profitability of Coal India was much better in 2020-23 compared to all other companies. Key findings reveal the sector's resilience in fluctuating commodity prices and regulatory changes. Moreover, the study identifies trends in financial performance across different segments of the metals and mining industry, shedding light on variations in profitability, efficiency, and risk management practices.

**Keywords:** Earnings Per Share (EPS), Return on Shareholder's Equity (RONW), Current Ratio, Acid Test Ratio, and Return on Assets (ROA).

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### 1. INTRODUCTION

India is known for its rich history in metallurgy and mining, significantly contributing to global metal production. Its mineral resources are diverse and abundant, encompassing a wide array of metallic and non-metallic minerals. The Indian mining sector plays a crucial role in the country's industrial development, economic growth, and infrastructure expansion (Prince, Kumar Maurya, Rohit, Bansal, Yasmeen, Ansari, Anand, 2023). The metals and mining industry is a cornerstone of India's economy, supplying essential raw materials for various sectors, including manufacturing, infrastructure, and construction. With its rich mineral resources and significant contribution to GDP, the sector plays a pivotal role in driving economic growth and development in the country (Mishra et al., 2022). However, the industry operates within a complex and dynamic environment characterized by volatile commodity prices, regulatory

challenges, technological disruptions, and global market dynamics. In this context, understanding the financial performance and health of metals and mining companies becomes imperative for stakeholders ranging from investors and policymakers to industry participants and analysts (Maurya, PK Rohit Bansal, Yasmeen Ansari, 2023).

Metals and mining corporations in India's market are the focus of this in-depth analysis of financial ratios. Important measures of a company's liquidity, profitability, operational efficiency, and financial health include financial ratios. This study seeks to shed light on the variables that influence the financial performance and sustainability of enterprises in India's metals and mining industry by conducting an in-depth analysis of these parameters (Zahera & Bansal, 2019).

The Indian metals and mining industry

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encompasses various commodities, including iron ore, coal, aluminium, copper, zinc, and precious metals. Each segment within the industry faces unique challenges and opportunities influenced by factors such as global demand-supply dynamics, regulatory policies, environmental considerations, technological advancements, and geopolitical factors. Against this backdrop, examining the financial ratios of companies operating in this sector provides valuable insights into their competitive positioning, risk exposure, operational efficiency, and strategic priorities.

Furthermore, this study considers the broader economic context in which India's metals and mining industry operates. The sector is intricately linked to the performance of other industries, such as manufacturing, infrastructure, and construction, making it susceptible to fluctuations in macroeconomic indicators such as GDP growth, inflation rates, and government policies. Understanding the interplay between these macroeconomic factors and the financial performance of metals and mining companies is crucial for assessing their resilience and adaptability to changing market conditions.

In recent years, the Indian metals and mining industry has witnessed significant developments ranging from policy reforms promoting ease of doing business to technological innovations enhancing operational efficiency and sustainability. Against this backdrop, examining the financial ratios of companies provides a nuanced understanding of the industry's evolution and the strategies firms adopt to navigate challenges and capitalize on opportunities.

Overall, this study seeks to contribute to the existing body of knowledge by offering a comprehensive analysis of the financial ratios of metals and mining companies in India. The research aims to provide stakeholders with actionable insights to inform investment decisions, policy formulation, and strategic planning within the metals and mining sector by delving into the intricacies of liquidity, profitability, leverage, and efficiency ratios.

## 1.1. Indian Metals And Mining Sector

### 1.1.1. Jindal Steel Ltd. (JSW Steel)

JSP is a famous Indian company that dominates in the infrastructure, steel, power, and mining industries. Improving the globe and securing America's future are its stated goals. When it comes to steel, electricity, mining, and infrastructure, JSP is unrivaled. The extraordinary success of the organization under Mr. Naveen Jindal's leadership has been molded by its dedication to innovation, which has established new standards, improved capacities, improved lives, and upheld its fundamental principles.

### 1.1.2. Coal India Limited (CIL)

Coal India Limited (CIL), a state-owned coal mining business, was founded in November 1975. In the year it was established, CIL produced a pitiful 79 million tons (MTs) of coal. With 239,210 employees as of April 1, 2023, it is among the biggest businesses in the world and is the biggest coal producer. Eighteen(8) states in India are part of CIL's mining operations via its subsidiaries. No less than 322 mines, including 138 underground, 171 opencast, and 13 mixed mines, were under the operation of Coal India Limited as of April 1, 2023. The corporation also managed a number of other types of facilities, including hospitals and workshops. Within CIL's purview are 21 Training Institutes and 76 Vocational Training Centers.

### 1.1.3. Hindalco Industries Limited (HIL)

In the metals industry, Hindalco Industries Limited stands as the flagship firm of the Aditya Birla Group. Iron ore and aluminum behemoth Hindalco is worth an estimated US\$28 billion. As of April 2020, after acquiring Aleris Corporation via its subsidiary Novelis Inc., Hindalco has cemented its position as the leading worldwide leader in flat-rolled products and aluminum recycling. Hindalco has a state-of-the-art copper complex that includes a fertiliser plant, a modern copper smelter, and a captive jetty. Among Asia's largest bespoke smelters, the copper smelter is located at one site.

### 1.1.4. Tata Steel

Tata Steel, the first privately owned integrated steel firm in Asia, was established in India in 1907. The first industrial city in India, Jamshedpur, was also constructed using technique. Among the world's leading steel producers, we are now ranked highly. Industrial Products, Projects, and Exports; Branded Products and Retail; Services and Solutions; and Automotive and Special Products make up the four sections that make up the Indian product portfolio. Branded solutions, cold-rolled, hot-rolled, galvanized, and more are all part of the company's inventory.

### 1.1.5. Bharat Forge

Essential and safety components are manufactured by Bharat Forge for many different sectors. These include the following: construction, mining, general engineering, oil and gas, aircraft, locomotives, maritime, energy (renewable and non-renewable sources), and automotive (commercial and passenger cars).

## 2. LITERATURE REVIEW

The steel sector is a cornerstone of India's

economic growth, substantially contributing to GDP and employment. Analyzing the financial performance of steel companies in India is paramount for investors, policymakers, and industry stakeholders to gauge their effectiveness, discern patterns, and formulate informed strategies. This literature review offers insight into the current body of research concerning the financial assessment of Indian steel firms, presenting significant discoveries, methodologies employed, and avenues for future exploration (Svanberg et al., 2018; Zheng et al., 2023).

In 2019, Gupta and Sharma undertook a comparative assessment of the financial performance of Indian steel enterprises vis-à-vis their global counterparts. Their investigation scrutinized variables, including revenue expansion, profitability metrics, and capital organization. The study yielded valuable perspectives on the competitive positioning of Indian steel firms in the global arena, pinpointing specific areas necessitating enhancement to bolster their financial stature (Bodhanwala & Bodhanwala, 2024; Ghazalat & AlHallaq, 2024; Kureljusic & Karger, 2024; Mbona & Yusheng, 2019; Melvin et al., 2004; Migliaccio & De Palma, 2023; Rahi et al., 2024; Thakur & Arora, 2024; Yang & Han, 2024). The literature emphasizes the significance of conducting comprehensive financial evaluations of Indian steel firms to gauge their performance and competitive edge. Research has delved into diverse facets such as financial indicators, macroeconomic factors, international comparisons, and corporate governance standards. Future studies could delve into emerging trends, technological innovations, and sustainability measures shaping the financial dynamics of the Indian steel sector.

Many books, scholarly articles, and business reports would make up an exhaustive literature analysis on financial ratios. Financial ratios are useful tools for examining and assessing a company's financial health and performance by comparing and contrasting different components of its financial statements. The following is a synopsis of some of the most important topics and conclusions found in the literature: (Cao et al., 2015; Christou et al., 2020).

## 2.1. Theoretical Frameworks

The link between financial ratios and business performance may be better understood with the use of theoretical frameworks as the Pecking Order Theory, Agency Theory, or signaling theory. Researchers often categorize financial ratios into different groups, such as ratios related to liquidity, profitability, leverage, and efficiency. Every category offers perceptions of various facets of an organization's financial well-being and operations. (Abedin et al., 2021; Elhoseny et al.,

2022). Literature offers diverse methodologies for interpreting financial ratios, including trend analysis, cross-sectional analysis, and industry benchmarking. Researchers explore the strengths and limitations of each technique and propose innovative approaches for more effective analysis. Numerous studies examine the predictive power of financial ratios in forecasting future firm performance, bankruptcy, or stock returns. These analyses contribute to understanding the usefulness of financial ratios as predictive tools for investors and managers (Bluwstein et al., 2020; Shajalal et al., 2023; Theiri & Hadoussa, 2024).

Comparative studies analyze the differences in financial ratios across industries, countries, or periods. These studies provide insights into the impact of contextual factors on financial ratio analysis and highlight best practices or common pitfalls in specific contexts. Empirical research and case studies provide real-world examples of how financial ratios are used in practice and their implications for decision-making. These studies often validate or challenge theoretical frameworks, offering practical insights for investors, managers, and policymakers (Bansal et al., 2021; Bansal & Singh, 2021; Vikas & Bansal, 2019).

Overall, the literature on financial ratios is vast and multifaceted, encompassing theoretical frameworks, empirical evidence, methodological approaches, and practical implications. By synthesizing findings from various studies, researchers continue to enhance our understanding of how financial ratios can effectively assess and manage financial performance and risks in diverse organizational contexts (Bansal et al., 2021; Bansal & Kar, 2021).

Many studies have examined the relationship between financial ratios and firm performance. For instance, Jones and Pendlebury (2017) found a positive correlation. Their analysis of S&P 500 companies compared profitability ratios like return on equity (ROE) and return on assets (ROA) with firm performance. In the process of making decisions, investors heavily rely on financial ratios. Nguyen and Faff (2019) investigated how investors use financial ratios to evaluate investment prospects and control risks. They discovered that before investing, investors frequently rely on liquidity ratios like the current and quick ratios to assess a company's short-term financial health.

Financial ratios are a tool managers use to assess performance, pinpoint areas for development, and formulate strategic choices. Horrigan (2016) emphasized the significance of utilizing a balanced set of financial ratios covering liquidity, profitability, leverage, and efficiency to present a complete picture of the company's financial health. Financial ratios are also used for industry benchmarking to compare a

company's performance against its peers. Brigham and Houston (2018) discussed the significance of benchmarking financial ratios within industries to identify competitive advantages, industry trends, and areas for improvement.

Research by Li et al. (2019) examines the applicability and significance of financial ratios in emerging markets, considering factors such as institutional environments, regulatory frameworks, and market dynamics. The study provides insights into the challenges and opportunities of using financial ratios for performance evaluation in emerging economies. Recent studies by Chen et al. (2017) and Zhang et al. (2020) explore integrating big data analytics techniques with financial ratio analysis. They investigate how machine learning and data mining enhance financial ratio-based models' predictive power and accuracy, offering new insights for decision-making and risk management.

Studies by Flammer (2018) and Grewal and Serafeim (2021) explore how ESG (environmental, social, and governance) variables affect financial performance and how ESG ratios might be included into conventional financial analysis models. The changing function of non-financial measures in evaluating the worth and longevity of a company is shown by these studies. Recent literature by Kim and Rhee (2019) and Xu et al. (2018) explores the implications of digitalization and technological advancements on financial ratio analysis. These studies examine how digital platforms, fintech innovations, and data analytics reshape traditional approaches to financial ratio interpretation and decision-making (Bansal et al., 2021, 2022; Bansal & Kar, 2021; Verma & Bansal, 2021).

These studies represent recent advancements in research on financial ratios, addressing emerging challenges and opportunities in diverse contexts such as emerging markets, big data analytics, ESG integration, and digital transformation.

**3. ACCOUNTING STATEMENTS**

**3.1. The Income Statement**

The income statement tracks a company's success across time, whereas the balance sheet takes a look at the company as it is right now. In principle, you might have a balance sheet for a month—or even a single day—despite though publicly listed corporations only report quarterly and yearly. Revenues, expenditures, and net income or loss for a certain accounting period are all laid out in the income statement.

**3.2. The Balance Sheet**

As of a certain date, the balance sheet lists the assets, liabilities, and equity of a company. The term "balance sheet" is derived from the following financial

balances that make up a company's structure:

Assets = Liabilities + Shareholder's Equity ..... Eqn (1) In any given time, a company's assets are the resources that it owns or controls. Money, stocks, equipment, and buildings are all included in this. The sum of all finance that the company used to acquire such assets is represented by the opposite side of the equation. Funding is derived from either equity or liabilities. Debt, of course, is a liability, while equity is the sum of all the money the owners have put into the business, including retained profits (the profit from prior years), plus any new investments.

**3.3. Key financial ratios**

There are five distinct ratios used in financial statement analysis. These are:

- (1) The liquidity ratio is a measure of a company's ability to meet its short-term financial obligations.
- (2) A company's total performance and the efficiency with which it handles its assets, liabilities, and equity may be evaluated using profitability ratios.
- (3) The liquidity and efficiency of an asset's management may be assessed using activity ratios, which are also called turnover ratios.
- (4) Asset turnover or management assesses how well a business generates income from its assets.
- (5) Long-term debt-to-leverage ratios, which measure the relationship between a company's equity and its debt, and thus its ability to pay interest and other fixed expenditures (Fraser & Ormiston, 2004); and
- (6) Insight into how investors see a firm and its future prospects is offered by market value ratios, which in turn affect the stock price.

**3.3.1. Liquidity Ratio**

**3.3.1.1. Current ratio**

Indicates the degree to which a corporation can meet its short-term financial obligations. Strong short-term financial strength is shown when a company's current assets exceed its current commitments. This is one possible format for calculating the current ratio:

Current Ratio = Current assets / Current liabilities..... Eqn..... (1.1)

Also referred to as "cash ratio," "cash asset ratio," and "liquidity ratio." A 2:1 ratio is optimal.

**3.3.1.2. Quick ratio or acid test ratio**

A company's ability to pay its short-term bills is shown by the quick ratio. The quick ratio measures a company's ability to meet its short-term debt obligations with its liquid assets. This is why the ratio

does not take inventory into account when determining current assets; ideally, the ratio would be 1:1.

$$\text{Quickratio} = \frac{\text{current assets} - (\text{cash and equivalents} + \text{marketable securities} + \text{accounts receivable})}{\text{current liabilities}} \dots \text{Eqn} \dots (1.2)$$

**3.3.2. Profitability Ratio:**

**3.3.2.1. Profit margin**

Divide net sales by profit after taxes to get a profitability ratio. One of the most useful ways to compare companies in the same industry is by looking at their profit margin. A more lucrative and well-controlled business will have a larger profit margin than its competitors. Here is how it is calculated:

$$\text{Profit Margin} = \frac{\text{Profit after tax}}{\text{Net sales}} \dots (1.3)$$

**3.3.2.2. Net profit margin**

Net income divided by sales or net profits divided by revenues is a profitability ratio. It figures out how much money a business generates for every rupee that goes into sales. One of the most useful ways to compare companies in the same industry is by looking at their profit margin. A more lucrative and well-controlled business will have a larger profit margin than its competitors. Here is how it is calculated:

$$\frac{\text{Net Income or Net Profit}}{\text{Net Sales}} \dots (1.4)$$

**3.3.2.3. Return on shareholder's equity (RONW)**

After paying out dividends to preferred shareholders and before paying out dividends to common stockholders, the net income for the whole fiscal year is determined. The equity of a shareholder does not include preferred shares. It is also known as "return on net worth" (RONW).

$$\text{RONW} = \frac{\text{Net Income}}{\text{Shareholder's Equity}} \dots (1.5)$$

**3.3.2.4. Return on assets**

A ratio that indicates how profitable a business is in comparison to its overall assets. Return on Assets (ROA) shows how efficient a company's management is at turning its resources into profit. The formula for return on assets is this.

$$\frac{\text{Net Income}}{\text{Avg. total assets}} \dots (1.6)$$

**3.3.3. Market-Based Ratios**

**3.3.3.1. Earnings per share**

A company's profit margin is the proportion of net income that goes to each outstanding share of common stock. Earnings per share are a measure of a company's profitability. Here is how it is calculated:

$$\text{EPS} = \frac{\text{Earning available}}{\text{No. Of share issued to shareholders}} \dots (1.7)$$

**3.3.3.2. Price-earnings ratio**

A method of valuing a corporation that involves comparing its current share price to its profits per share. It is calculated by:

$$\text{P/E Ratio} = \frac{\text{Market price per share}}{\text{EPS}} \dots (1.8)$$

**3.3.4. Solvency Ratio**

**3.3.4.1. Inventory turnover ratio**

A company's inventory replenishment and sales frequency may be seen in the ratio. This formula may be used to get the number of days it takes to sell the current inventory, which is also called "inventory turnover days," by dividing the total number of days in the period by inventory turnover. The formula for it is as follows:

$$\text{Inventory turnover ratio} = \frac{\text{Cost of goods sold}}{\text{Average inventory}} \dots (1.9)$$

**3.3.4.2. Debtor turnover ratio**

The activity or turnover ratio may be calculated by dividing the total sales by the average debtor credit sales. No business wants a large proportion of debtors going out of business. The computation is as follows:

$$\text{Debtor turnover ratio} = \frac{\text{Credit sales}}{\text{Average debtors}} \dots (1.10)$$

**3.3.4.3. Working capital turnover**

A company's working capital turnover rate is the rate at which its working capital is turned into revenues within a certain time frame. This tells you a lot about how a business spends its money and how profitable it is. The formula for it is as follows:

$$\text{Working capital turnover} = \frac{\text{Sales}}{\text{Working capital}} \dots (1.11)$$

**3.3.4.5. Total asset turnover**

Net sales as a proportion of total assets might be one such formula. How well assets are being turned into revenue is quantified by this indicator. A number of advantages will accrue to a business that is able to maintain a high total asset turnover rate. The formula for it is as follows:

$$\text{Total asset turnover} = \frac{\text{Net sales}}{\text{Total assets}} \dots (1.12)$$

**3.3.5. Leverage Ratios**

**3.3.5.1. Debt to equity**

Divide the total liabilities of a firm by the equity investors own to get its financial leverage. This metric reveals the asset financing mix of a company, broken

down by debt and equity. Here is how it is calculated:

$$\text{Debt to equity} = \frac{\text{Long-term debt or liabilities}}{\text{Total equity}} \dots\dots\dots (1.13)$$

**3.3.5.2. Interest coverage ratio**

In the 1920s, the DuPont Company came up with a way to gauge performance. This method might increase ROE as it uses gross book value rather than net book value to price assets. The return on equity increases as the result becomes better. The formula is:

$$\text{Interest coverage ratio} = \frac{\text{EBIT}}{\text{Interest expenses}} \dots\dots\dots (1.14)$$

**3.3.6 DuPont Analysis**

A method to measure performance was developed by the DuPont Company in the 1920s. This approach has the potential to improve return on equity (ROE) by pricing assets at gross book value instead of net book value. As the outcome improves, the return on equity rises. According to Fraser and Ormiston (2004), the DuPont method helps analysts comprehend how a firm's choices and activities contribute to its return on equity, which is the overall return to shareholders, over an accounting period. In addition, the method produces the ROI as the sum of the equity multiplier, total asset turnover, and profit margin (Brigham and Houston, 2009).The interrelationships of activity, leverage, and profitability are shown. Here is how it is calculated:

$$\text{DuPont analysis} = \frac{\text{Profit after tax}}{\text{Total equity}} \dots\dots\dots (1.15)$$

**4. RESEARCH METHODOLOGY**

To analyze financial ratios, this research use the blended frameworks proposed by Fraser and Ormiston (2004) and Brigham and Houston (2009). By combining the two models, one may deduce from the DuPont equation the interplay between the different ratios. This study's methodology sorted financial measures into five groups: liquidity, profitability, solvency, market-based ratio, and leverage ratio.

**4.1. Problem and goals of the research**

Important Indian metals and mining companies' financial performance from 2019 to 2023 is compared in this research study using similar financial facts. Among these businesses are Bharat Forge, Tata Steel, Jindal Steel, Hindalco Industries, and Coal India. The researcher used the "Yahoo Finance" database and the corporate websites of the chosen metal and mining enterprises to get their audited financial statements for the five-year period (2019–2023). Data from the fiscal year ending on March 31st is used for financial analysis for Indian firms. These financial statements provided the data required for financial ratios. For this

study, we resorted to comparable financial ratios that emerged during the processing and summary phases. Can you tell me about the typical practices, averages, and unique aspects of the mining and metals business in India? What are the answers to these questions that this research derives from its use of liquidity, activity, leverage, profitability, and market value ratios?

Furthermore, the specific goals of this study are to fulfil the following objectives:

- i. To calculate market value, profitability, activity, leverage, and liquidity ratios.
- ii. To ascertain industry statistics and unique characteristics of India's mining and metals industry.
- iii. To ascertain a comparative financial analysis between the mining and metals companies that have been chosen.
- iv. To assess the performance of the finances through DuPont analysis.

**5. DESCRIPTIVE STATISTICS**

Given in Table 1 are the following financial ratios for the years 2020–2023, which pertain to Jindal Steel. This set of ratios includes activity, which measures the turnover of working capital and inventory, assets, which measures the turnover of fixed assets and total assets, leverage, which measures the ratio of debt to equity, interest coverage, shareholder's equity, and return on total assets, liquidity, which measures the ratio of current assets to total assets, acid test, and current ratios. Another set of ratios is included in this set. Lastly, this collection includes profitability, which is a measure of the asset-to-net-worth ratio, return on capital employed, earning per share, price-earnings ratio, net profit margin, and profit margin. and At the end of the process, we use DuPont analysis to assess the company's financial success.

Table 2 displays the results of several financial ratios for the years 2020–2023, as they apply to Coal India. The included ratios are as follows: performance metrics, including inventory and working capital turnover, assets turnover ratios for fixed and total assets, debt to equity, interest coverage, shareholder's equity, and return on total assets; liquidity metrics, including current ratio and acid test ratio; profitability metrics, including return on assets (ROA), return on net worth (RONW), return on capital employed (ROCE), earning per share (EPS), price-earnings ratio (P/E), net profit margin, and profit margin; and activity metrics, which represent inventory and working capital turnover, assets turnover ratios for fixed and total assets, and total assets turnover, respectively; and Finally, this study also uses DuPont analysis to assess the firm's financial performance.

The results of several financial metrics for

**Table 1. Ratio Analysis for Jindal Steel from 2020 to 2023**

Ratio	Jindal Steel			
	2023	2022	2021	2020
Liquidity Ratio				
Current ratio	0.998	1.172	1.053	0.687
Quick ratio	0.618	0.851	0.745	0.413
Profitability Ratio				
Return on assets	0.045	0.088	0.054	-0.001
Return on shareholders' equity	0.081	0.189	0.134	-0.003
Return on total(ROCE)	0.109	0.240	0.175	0.056
Earnings per share(EPS)	31.114	66.324	41.833	-1.070
Book value per share	382.507	363.647	303.295	307.453
Market price to book value ratio	1.682	1.418	1.098	0.257
Price earnings ratio(P/E)	20.686	7.777	7.963	-74.008
Dividend Pay-out ratio	0.064	0.0150	0.000	0.000
Dividend yield	0.003	0.001	0.000	0.000
Gross profit margin	0.540	0.288	0.381	0.257
Net profit margin	0.060	0.097	0.087	-0.002
Profit margin	0.112	0.186	0.210	0.084
Turnover Ratio				
Inventory turnover ratio	3.675	7.497	4.910	10.330
Average No. days inventory in stock	99.316	48.682	74.331	35.333
Working capital turnover	27.145	28.161	-15.743	-12.215
Assets Turnover				
Fixed assets turnover	1.013	1.295	0.745	1.201
Total assets turnover	0.721	0.901	0.583	0.987
Invested capital turnover	1.361	1.955	1.537	1.378
Equity turnover	1.418	2.065	1.529	2.756
Capital intensity	1.317	1.100	1.591	2.026
Leverage Ratio				
Debt to equity	0.785	1.110	1.474	1.816
Debt to total capital	0.252	0.274	0.484	0.541
Interest coverage ratio	5.963	8.777	4.591	1.906
Shareholder's equity ratio	0.557	0.464	0.408	0.358

Hindalco Industries are shown in Table 3 on an annual basis from 2020 to 2023. Included in it are the following ratios: To evaluate the financial well-being of a business, one may utilize the following ratios and metrics: a variety of financial metrics, including activity, which measures the turnover of inventory and working capital, assets turnover ratio, which measures the turnover of fixed assets and total assets, liquidity, which measures the current ratio and acid test ratio, profitability, which measures ROA, RONW, ROCE, EPS, P/E, net profit margin, profit margin, and ROCE, and many more. and At last, the research has also assessed the organization's financial performance using DuPont

analysis.

Results for Tata Steel's various financial ratios during 2020–2023, as shown in Table 4. In addition to the liquidity ratios (current and acid test), the profitability ratios (ROA, RONW, ROCE, EPS, P/E, net profit margin, and profit margin), the activity ratios (inventory, working capital, and assets turnover), the leverage ratios (debt to equity, interest coverage, shareholder's equity, and return on total asset), and the profitability metric (current and acid test ratios, current and acid test, ROA, RONE, ROCE, ROW, EPS, P/E, P/E, net profit margin, and profit margin), the inventory ratios, the acid test ratios, and the profitability metric were also

**Table 2. Ratio Analysis for Coal India Limited from 2020 to 2023**

Ratio	Coal India Limited			
	2023	2022	2021	2020
Liquidity Ratio				
Current ratio	1.572	1.617	1.640	1.723
Quick ratio	1.453	1.494	1.467	1.586
Profitability Ratio				
Return on assets	0.133	0.096	0.078	0.111
Return on shareholders' equity	0.492	0.402	0.347	0.519
Return on total (ROCE)	0.271	0.195	0.167	0.241
Earnings per share (EPS)	45.702	28.166	20.607	27.121
Book value per share	94.139	71.099	59.970	52.819
Market price to book value ratio	3.341	2.286	1.760	1.821
Price earnings ratio (P/E)	6.882	5.771	5.121	3.547
Dividend pay-out ratio	0.087	0.186	0.242	0.442
Dividend yield	0.012	0.032	0.047	0.124
Gross profit margin	0.837	0.811	0.858	0.865
Net profit margin	0.220	0.172	0.153	0.186
Profit margin	0.303	0.239	0.222	0.273
Turnover Ratio				
Inventory turnover ratio	2.729	2.361	1.511	3.632
Average No. days inventory in stock	133.736	154.546	241.497	100.480
Working capital turnover	3.413	2.932	2.433	5.109
Assets Turnover				
Fixed assets turnover	1.339	1.221	1.155	2.692
Total assets turnover	0.163	0.1468	0.132	0.298
Invested capital turnover	2.229	2.328	2.270	2.784
Equity turnover	2.542	2.522	2.414	5.569
Capital intensity	1.654	1.794	1.951	1.675
Leverage Ratio				
Debt to equity	2.676	3.162	3.418	3.653
Debt to total capital	0.070	0.075	0.138	0.166
Interest coverage ratio	63.363	62.393	49.645	64.372
Shareholder's equity ratio	0.271	0.239	0.225	0.214

used to assess the company's financial performance. The paper concludes by using DuPont analysis.

From 2020–2023, the results of Bharat Forge's financial ratios are shown in Table 5. These ratios are part of a larger set that includes things like activity, which measures the turnover of working capital and inventory, assets turnover, which measures the turnover of fixed assets and total assets, leverage, which measures the ratio of debt to equity, interest coverage, shareholder's equity, and return on total assets, liquidity, which measures the ratio of current assets to total assets, and profitability, which measures things

like assets to net worth, return on capital employed, earning per share, price-earnings ratio, net profit margin, and profit margin. liquidity ratios, which are a shorthand for current and acid test ratios, are the last set of measurement tools. and At last, the research has also assessed the organization's financial performance using DuPont analysis.

## 6. RESULTS AND LEARNING INSIGHTS

The five categories of financial ratios serve as the framework for this section of the essay. In addition, we provide and analyze specific ratios for each category. The section concludes with the derived DuPont equation, which is also presented and discussed.



## 6.1. Liquidity Ratios

### 6.1.1. Current Ratio Analysis:

One indicator of financial health is the current ratio, which calculates the likelihood that a corporation can pay off its short-term debt within a year. A current ratio greater than two indicates that a company's assets are sufficient to meet its current liabilities, as is often the case. If the ratio is less than 2, on the other hand, it means that you will have trouble paying your upcoming obligations. Figure 1 shows that in 2023, the present ratio for Tata Steel will be at its lowest and for Coal India, the strongest. However, because no company's

current ratio is more than 2, we may say that none of them are suitable. In the four-year investigation, the best current ratio was recorded by Coal India, at 1.635.

### 6.1.2. Quick Ratio Analysis:

A liquidity ratio that evaluates a company's ability to meet its short-term obligations with its easily convertible assets is the quick ratio, which is also called the acid test ratio. When comparing a company's liquidity, this ratio takes a more cautious approach compared to the current ratio. In 2023, the graph shows that Tata Steel has the poorest quick ratio, while Coal

**Table 3. Ratio Analysis for Hindalco Industries from 2020 to 2023**

Ratio	Hindalco Industries			
	2023	2022	2021	2020
Liquidity Ratio				
Current ratio	1.477	1.275	1.394	1.780
Quick ratio	0.766	0.699	0.762	1.179
Profitability Ratio				
Return on assets	0.044	0.061	0.018	0.022
Return on shareholders' equity	0.106	0.175	0.052	0.064
Return on total(ROCE)	0.102	0.156	0.079	0.070
Earnings per share(EPS)	45.260	61.098	15.502	16.766
Book value per share	425.021	348.001	296.183	259.603
Market price to book value ratio	1.081	1.157	1.892	1.230
Price earnings ratio(P/E)	10.152	6.591	36.164	19.060
Dividend payout ratio	0.066	0.065	0.193	0.059
Dividend yield	0.006	0.009	0.005	0.003
Gross profit margin	0.259	0.278	0.272	0.266
Net profit margin	0.045	0.070	0.026	0.032
Profit margin	0.075	0.117	0.085	0.080
Turnover Ratio				
Inventory turnover ratio	3.778	3.722	3.594	7.681
Average No. days inventory in stock	96.596	98.047	101.549	47.516
Working capital turnover	8.905	9.590	5.436	8.060
Assets Turnover				
Fixed assets turnover	1.716	1.571	1.162	2.269
Total assets turnover	0.996	0.938	0.729	1.381
Invested capital turnover	2.354	2.477	1.969	2.008
Equity turnover	2.580	2.677	2.098	4.017
Capital intensity	1.007	1.151	1.447	1.447
Leverage Ratio				
Debt to equity	1.371	1.852	1.851	1.906
Debt to total capital	0.388	0.451	0.502	0.539
Interest coverage ratio	6.575	9.167	5.327	4.182
Shareholder's equity ratio	0.421	0.350	0.350	0.343

**Table 4. Ratio Analysis for Tata Steel from 2020 to 2023**

Ratio	Tata Steel			
	2023	2022	2021	2020
Liquidity Ratio				
Current ratio	0.890	1.021	0.849	0.952
Quick ratio	0.331	0.482	0.380	0.448
Profitability Ratio				
Return on assets	0.030	0.140	0.030	0.006
Return on shareholders' equity	0.084	0.350	0.100	0.021
Return on total(ROCE)	0.128	0.285	0.122	0.038
Earnings per share(EPS)	7.170	32.881	6.226	1.292
Book value per share	86.083	95.889	64.432	63.251
Market price to book value ratio	1.384	1.055	2.028	1.153
Price earnings ratio(P/E)	16.617	3.077	20.993	56.441
Dividend pay-out ratio	0.502	0.155	0.401	0.773
Dividend yield	0.030	0.025	0.019	0.013
Gross profit margin	0.531	0.554	0.543	0.492
Net profit margin	0.036	0.164	0.047	0.011
Profit margin	0.101	0.228	0.137	0.052
Turnover Ratio				
Inventory turnover ratio	2.193	2.649	2.215	4.565
Average No. days inventory in stock	166.385	137.779	164.716	79.944
Working capital turnover	-55.750	-56.120	-23.012	-95.496
Assets Turnover				
Fixed assets turnover	1.225	1.290	0.829	1.458
Total assets turnover	0.842	0.918	0.630	1.116
Invested capital turnover	2.344	2.131	2.105	1.900
Equity turnover	2.221	2.585	2.114	3.800
Capital intensity	1.191	1.170	1.570	1.791
Leverage Ratio				
Debt to equity	1.773	1.471	2.262	2.368
Debt to total capital	0.451	0.397	0.543	0.612
Interest coverage ratio	5.377	11.861	4.033	2.125
Shareholder's equity ratio	0.3578	0.400	0.3024	0.293

India has the best. The four-year analysis found that Coal India had the best Quick Ratio, coming in at 1.495 (see Fig:2).

## 6.2. Profitability Ratio

### 6.2.1. Return on Assets (ROA)

The return on assets (ROA) ratio is one indicator of a company's financial well-being. This indicator helps analysts and investors understand how efficiently a firm makes money. A high return on assets (ROA) indicates that resources are being put to good use in generating profits, whilst a low ROA implies the inverse. According to the data that is available as of 2023, the ROA ratio is

highest for Coal India and lowest for Bharat Forge. After four years of study, Coal India's return on assets (ROA) ratio of 0.104 remains the best (see Fig. 3). "

### 6.2.2. Return on Shareholders' Equity

Return on equity (ROE) is a financial metric that quantifies a company's profitability in relation to the equity it has raised from shareholders. For every dollar that shareholders invest in a corporation, it shows the return on investment (ROI). A high return on equity (ROE) indicates that a corporation is effectively converting shareholder stock into income. Conversely, a poor return on equity indicates that the firm is inefficient

**Table 5 Ratio Analysis for Bharat Forge from 2020 to 2023**

Ratio	Bharat Forge			
	2023	2022	2021	2020
Liquidity Ratio				
Current ratio	1.087	1.297	1.375	1.328
Quick ratio	0.709	0.853	0.978	0.891
Profitability Ratio				
Return on assets	0.028	0.069	-0.009	0.030
Return on shareholders' equity	0.078	0.164	-0.023	0.067
Return on total (ROCE)	0.111	0.158	0.008	0.076
Earnings per share (EPS)	15.265	17.631	0.00	0.00
Book value per share	194.784	108.010	0.00	0.00
Market price to book value ratio	5.233	7.087	0.00	0.00
Price earnings ratio (P/E)	66.772	43.416	0.00	0.00
Dividend pay-out ratio	0.360	0.085	0.00	0.00
Dividend yield	0.005	0.001	0.00	0.00
Gross profit margin	0.538	0.425	0.405	0.387
Net profit margin	0.040	0.109	-0.020	0.045
Profit margin	0.087	0.152	0.012	0.075
Activity or Turnover Ratio				
Inventory turnover ratio	2.042	2.527	2.048	5.412
Average No. days inventory in stock	178.684	144.403	178.146	67.433
Working capital turnover	10.157	5.637	4.054	11.767
Assets Turnover or Management				
Fixed assets turnover	1.5134	1.352	0.917	2.438
Total assets turnover	1.5134	0.827	0.751	0.526
Invested capital turnover	1.925	1.507	1.123	1.469
Equity turnover	1.944	1.652	1.143	2.938
Capital intensity	1.423	1.576	2.166	1.507
Long Term Debt or Leverage Ratio				
Debt to equity	1.736	1.367	1.427	1.209
Debt to total capital	0.521	0.476	0.493	0.461
Interest coverage ratio	6.232	17.396	6.935	9.512
Shareholder's equity ratio	0.364	0.420	0.410	0.451 "

in generating returns from its assets. According to the data presented, Coal India has the highest return on equity (ROE) in 2023, while Bharat Forge has the lowest. Coal India maintained the highest return on equity (ROE) ratio over the four-year research (see Fig. 4).

### 6.2.3. Earnings per Share (EPS)

Divide a company's profit by the total number of common stock shares outstanding to get the earnings per share (EPS) ratio, which is a measure of profitability. When profits per share go up, more money ends up in the pockets of shareholders. Profits

per share (EPS) is one of numerous financial statistics and valuation indicators that involve a company's stock price because of how reliant it is on EPS. The following image illustrates that in 2023, Coal India will have the highest earnings per share (EPS) ratio, while Tata Steel would have the lowest. Throughout the four-year analysis, the top ROA ratio was maintained by Hindalco Industries at 34.65 (refer to Fig:5).

### 6.2.4. Price Earnings Ratio

One valuable valuation measure for investors is the price-earnings ratio (P/E ratio), which compares the stock price of a firm to its earnings per share (EPS).

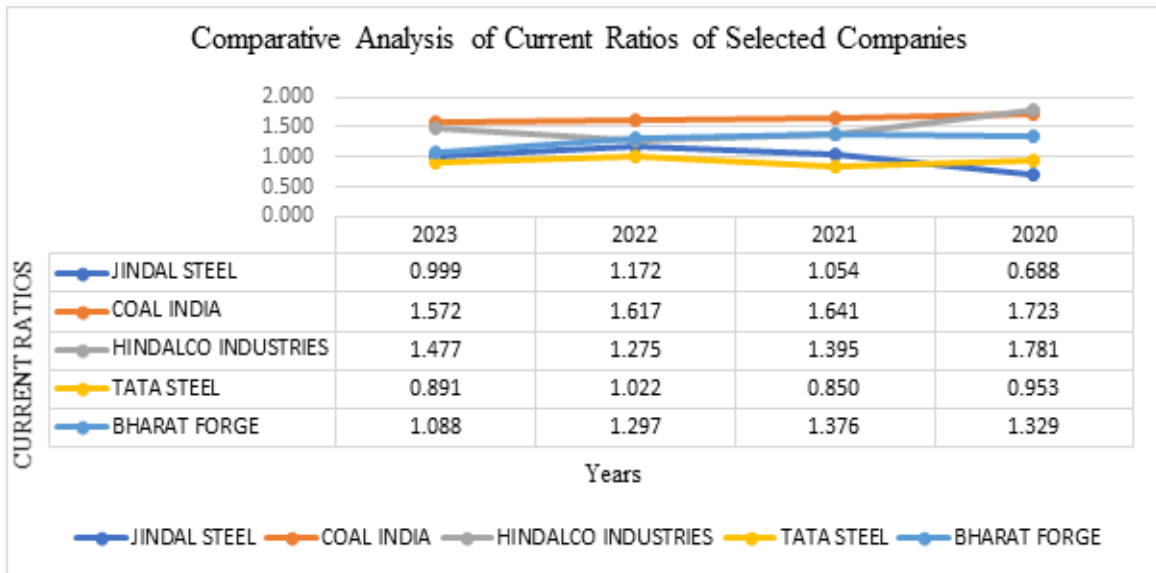


Figure 1. Comparative analysis of the current ratio of steel companies from 2020-2023

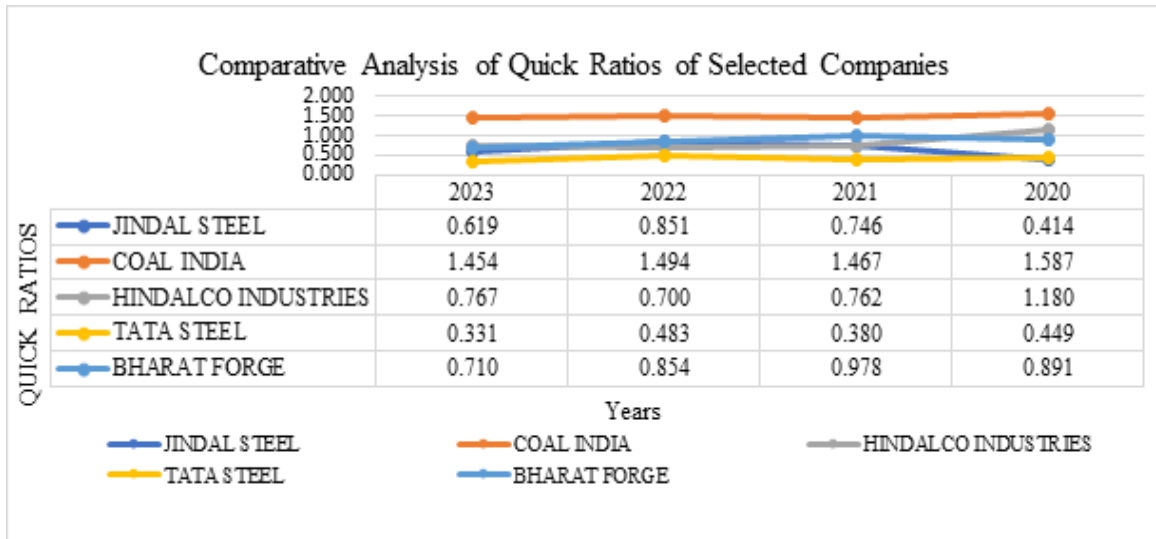


Figure 2. Comparative analysis of quick ratio of steel companies from 2020-2023

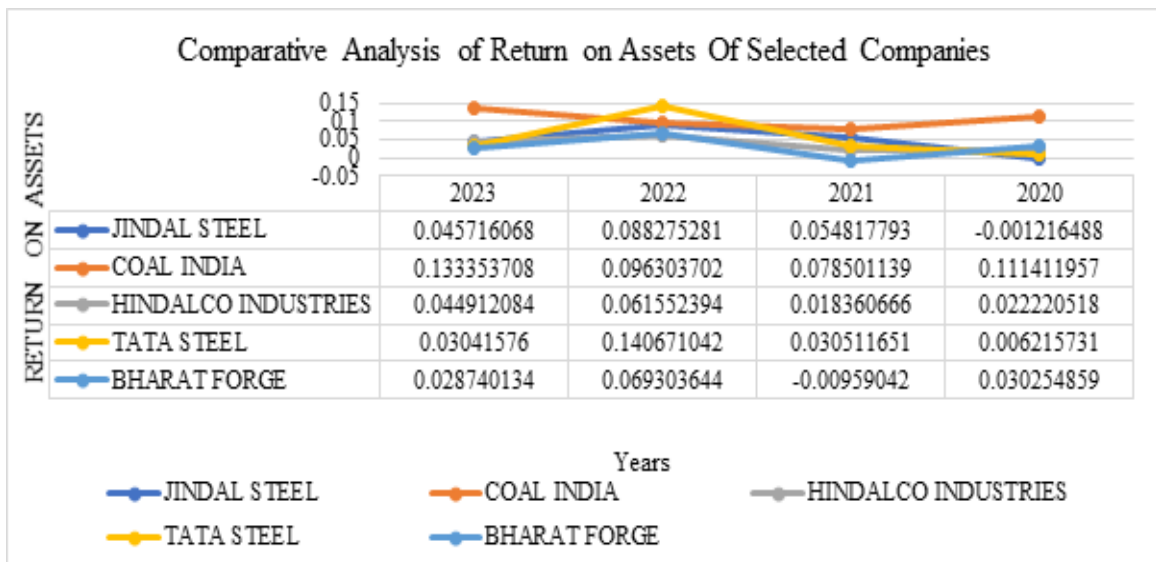


Figure 3. Comparative analysis of return on assets of steel companies from 2020-2023

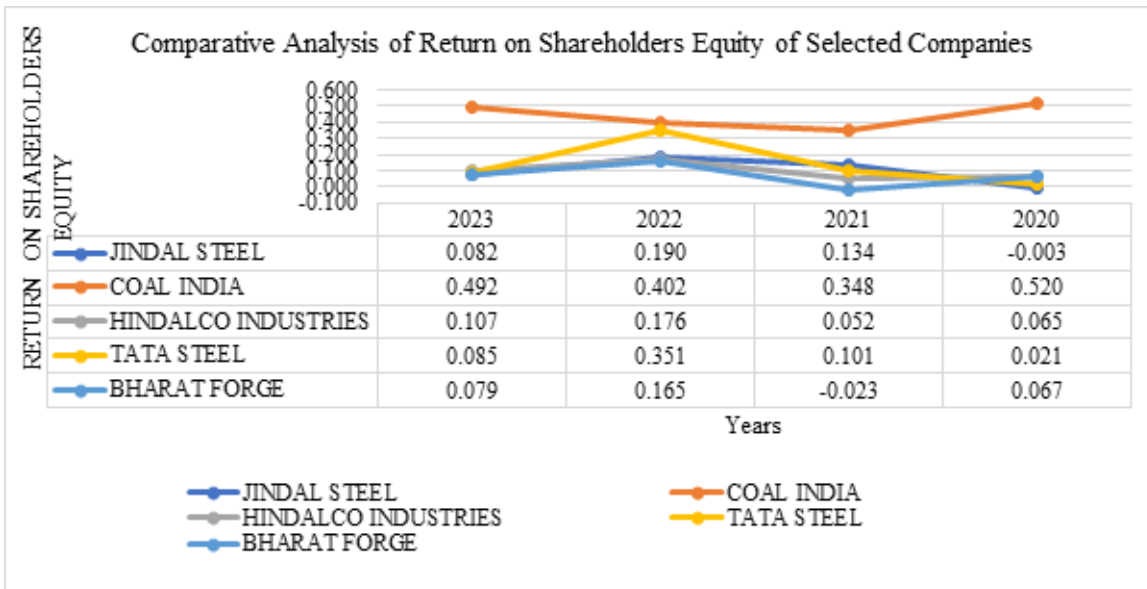


Figure 4. Comparative analysis of return on shareholder’s equity of steel companies from 2020-2023

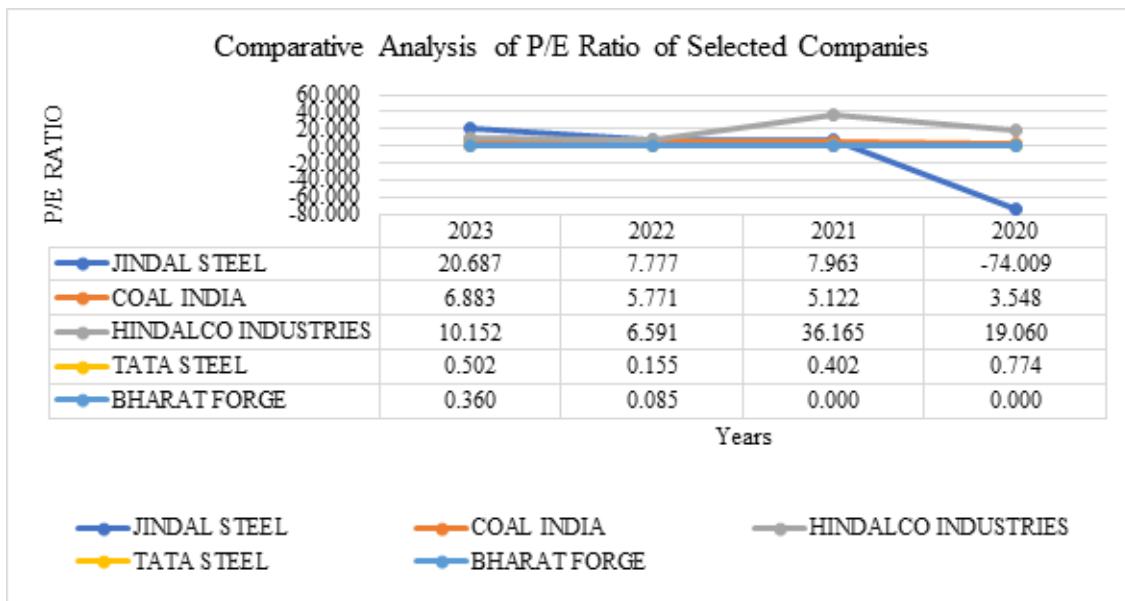


Figure 5. Comparative analysis of price-earnings ratio of steel companies from 2020-2023

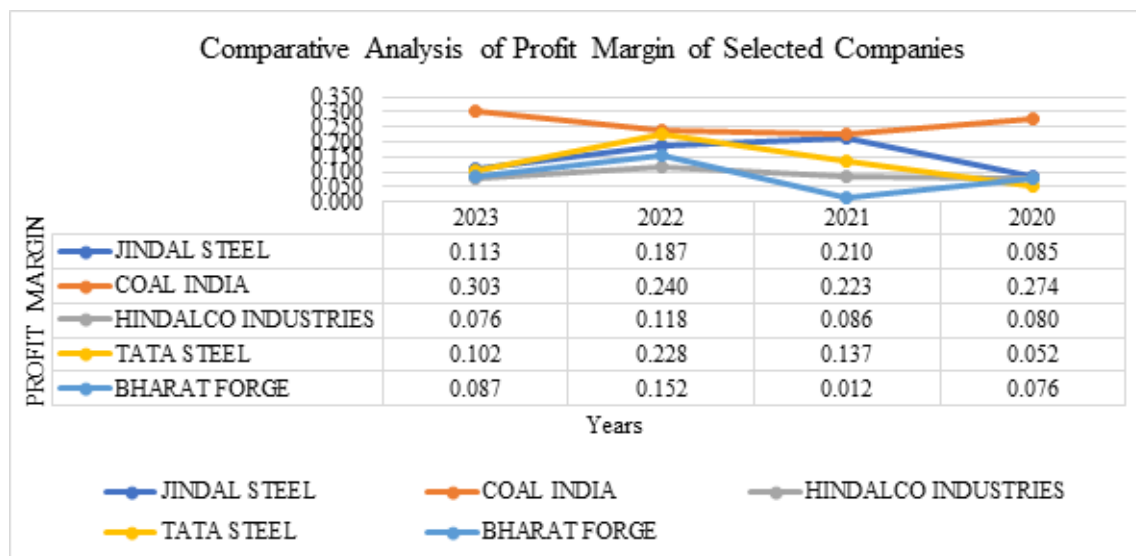


Figure 6. Comparative analysis of profit margin of steel companies from 2020-2023

If the price-to-earnings ratio is low, it might mean that the stock is cheap or that the company is having financial problems. On the other side, a high P/E ratio indicates that investors are placing their money on the expectation of future profit growth. As you can see from the chart, Jindal Steel has the greatest P/E ratio as of 2023, while Bharat Forge has the lowest. Over the course of the four-year analysis, Bharat Forge's P/E ratio remained the highest at 27.54 (see Fig:6).

**6.2.5. Profit Margin**

One financial metric for gauging the overall profitability of a company's sales is the profit margin ratio. A larger profit margin ratio shows that you're good at controlling costs and making money off of sales. A lower profit margin ratio occurs when expenses surpass revenues or when revenues fall short of expenses. Based on the data supplied, Jindal Steel has the greatest profit margin ratio in 2023, while Hindalco Industries has the lowest. The profit margin ratio for Coal India stays at the most favorable 0.25 throughout the four-year study (see Fig:7).

**6.3. Activity Ratios**

**6.3.1. Working Capital Turnover**

The working capital turnover ratio is one indicator of how quickly a business can convert its cash on hand into profit. The greater the working capital turnover ratio, the more effectively the firm converts its working capital into profit. Working capital turnover ratios that are low are associated with inefficient use of working capital to produce income. In 2023, the working capital ratio will be greatest at Jindal Steel and lowest at Tata Steel, as shown in the following figure. Throughout the four-year evaluation, Hindalco

Industries maintained the highest favorable Working Capital ratio (7.99) (see Fig:8).

**6.4. Assets Turnover Management**

**6.4.1. Total Assets Turnover**

The total assets turnover ratio is a measure of how efficiently a firm converts its total assets into revenues. If a business is efficient in converting its assets into profits, the ratio will be high. This is indicative of efficient asset use by the organization. However, if the ratio is low, it might indicate that the firm isn't making the most of its resources to produce money. Coal India has the lowest Total Assets Turnover ratio in 2023, while Bharat Forge has the highest, according to the statistics. Hindalco Industries had the best Total Assets Turnover ratio (1.011) for the whole four-year study (see Fig. 9)."

**6.5. Leverage Ratios**

**6.5.1. Debt to Equity Ratio**

One indicator of a company's funding structure is the debt-to-equity ratio (D/E), which shows how much of the capital comes from creditors rather than shareholders. A company's exposure to financial risk and leverage is measured by this indicator. A high debt-to-equity ratio indicates that a firm is heavily dependent on debt funding for its operations, which might put its financial health at risk. Conversely, a low percentage indicates that the company is frugal and uses equity capital more often. Coal India will have the highest debt-to-equity ratio in 2023, while Jindal Steel would have the lowest (see Fig:10).

**6.5.2. Interest Coverage Ratio**

One financial metric that looks at a company's solvency is the interest coverage ratio. It shows how well

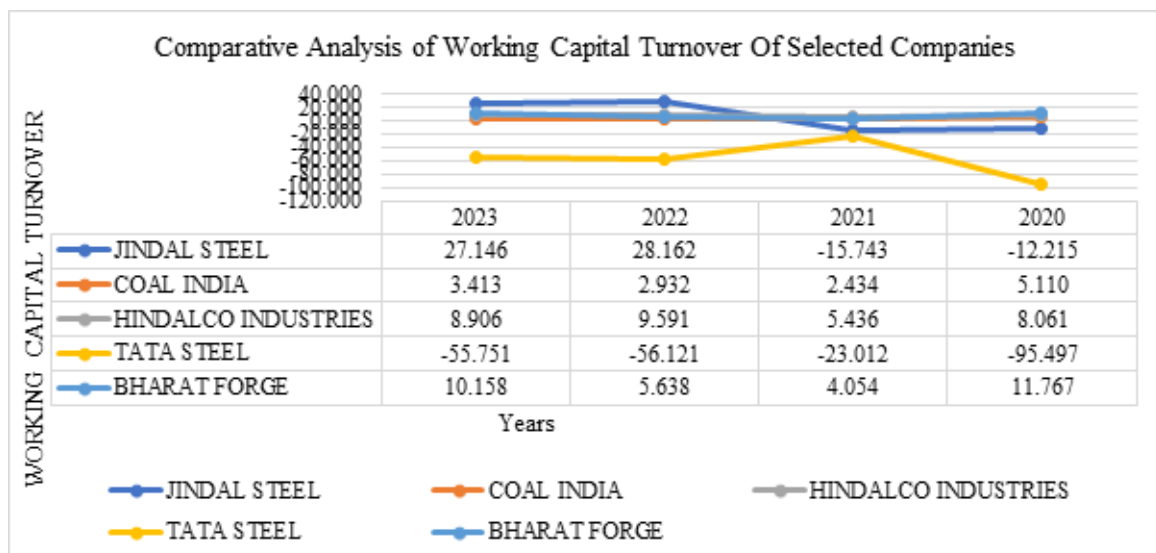


Figure 7. Comparative analysis of working capital turnover of steel companies from 2020-2023

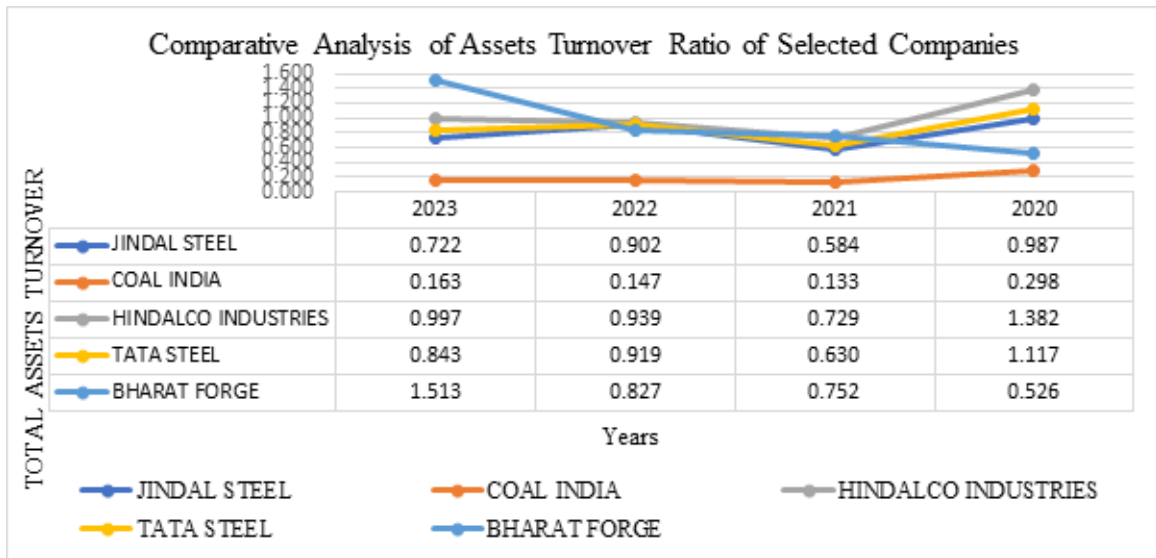


Figure 8. Comparative analysis of total assets turnover of steel companies from 2020-2023

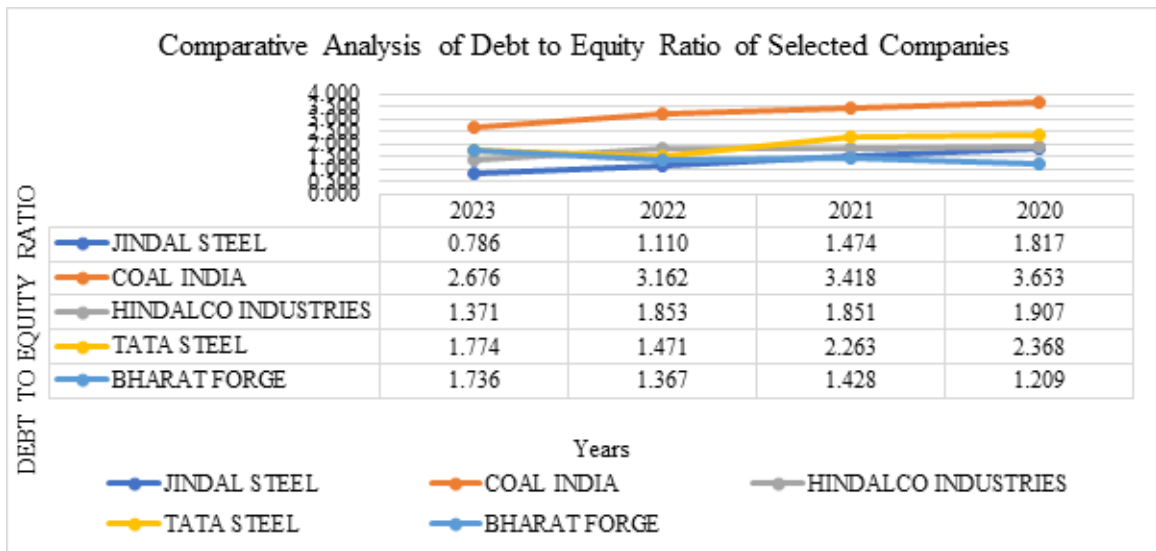


Figure 9. Comparative analysis of Debt to equity of steel companies from 2020-2023

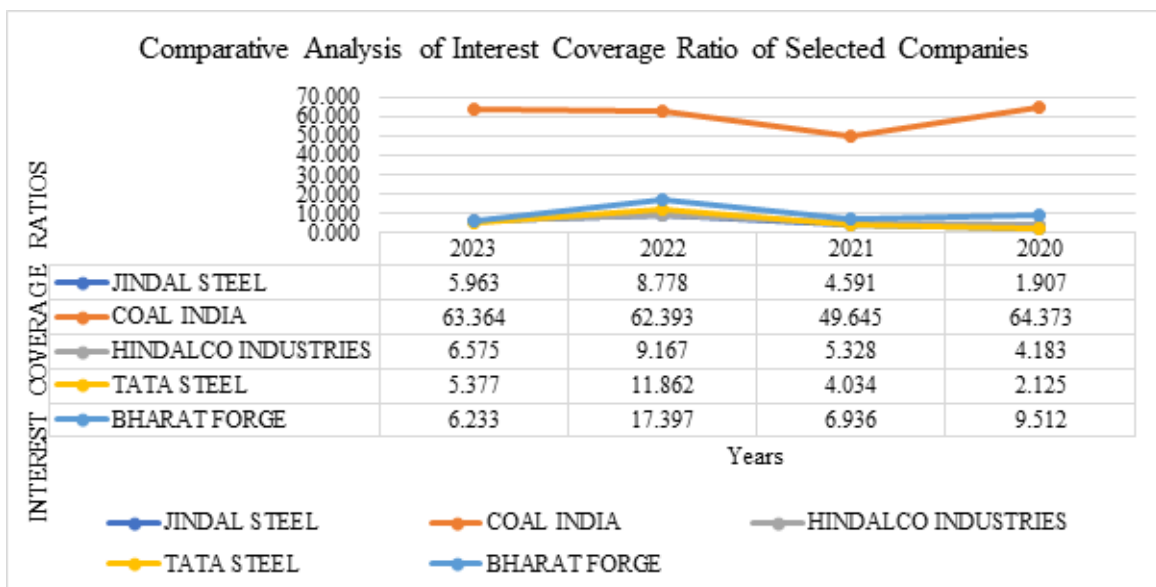


Figure 10. Comparative analysis of Debt to equity of steel companies from 2020-2023

the company can pay the interest on its current debt. An elevated interest coverage ratio indicates that operating earnings are sufficient to cover interest expenses. As a result, the likelihood of debt default will decrease. On the other hand, a low ratio indicates that the firm would have problems meeting its interest payments with its current revenue, which raises the possibility of default. In 2023, the attached figure shows that Tata Steel would have the lowest Interest Coverage ratio, followed by Coal India with the highest. Throughout the four-year examination, Jindal Steel consistently has the lowest Interest Coverage ratio of 5.30 (see to Fig:11).

**6.6 DuPont Analysis**

Important factors such as financial leverage, assets turnover ratio, and net profit margin are brought to light by DuPont analysis, which essentially shows how return on equity is computed systematically. All of them, as shown in Figure 11, add up to the Return on Equity.

**6.8. Ranking based on 5-Step DuPont Analysis**

Consequently, as compared to its competitors, Coal India clearly has the strongest financial footing.

**7. CONCLUSION**

The financial health, operational efficacy, and return on equity of a business may be better understood with the use of ratio analysis and the DuPont analysis. They make it easier to assess a variety of financial metrics, compare results to industry standards, pinpoint strengths and areas for improvement, analyze trends over time, and make educated decisions for stakeholders and investors. A company's liquidity, profitability, solvency, and efficiency may be assessed using these analytical approaches, which can assist spot potential dangers and opportunities for development. The results can then be used to guide future growth and success. After carefully examining the financial statistics of the five organizations

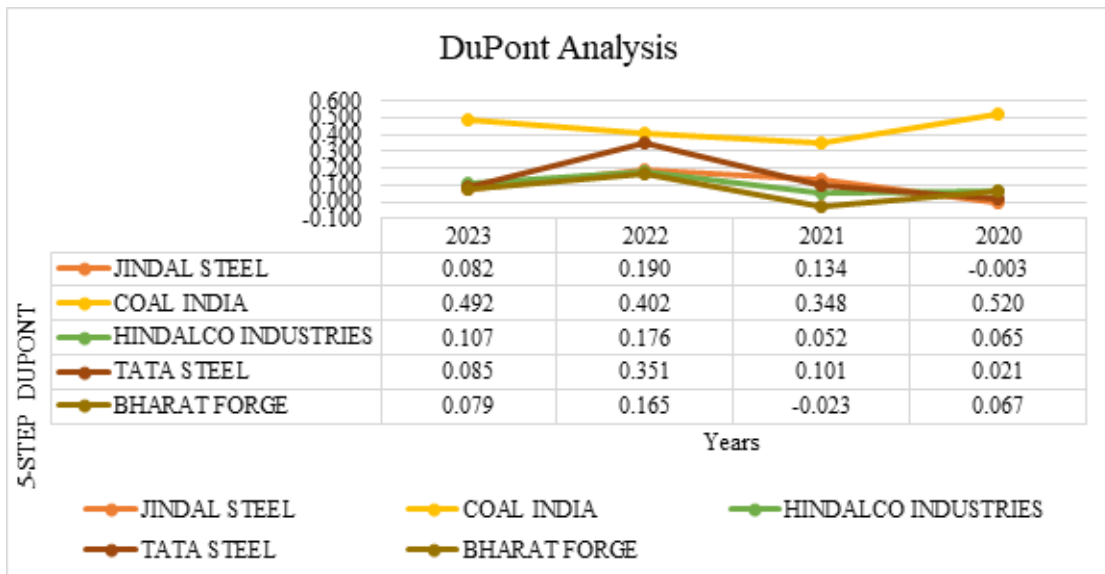
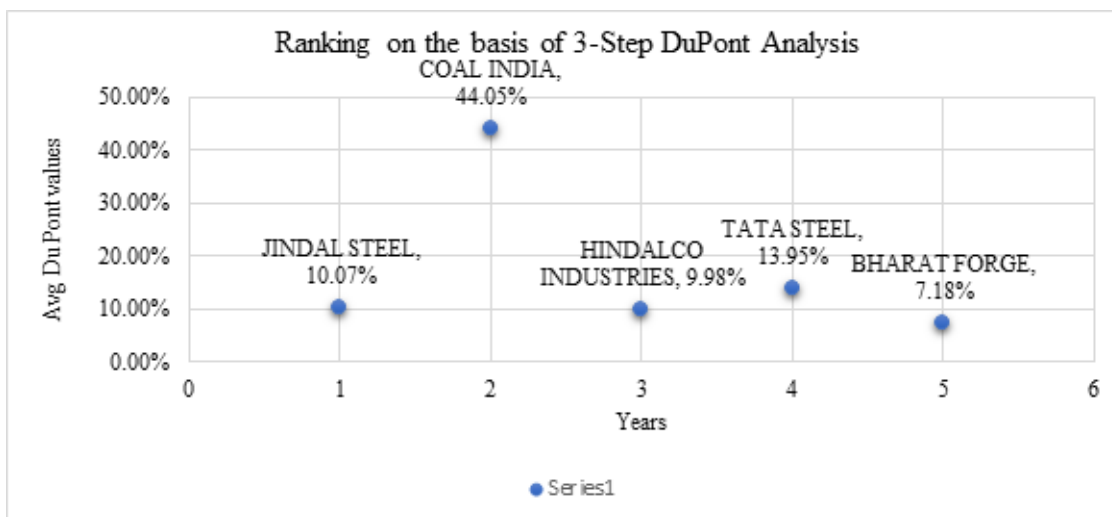


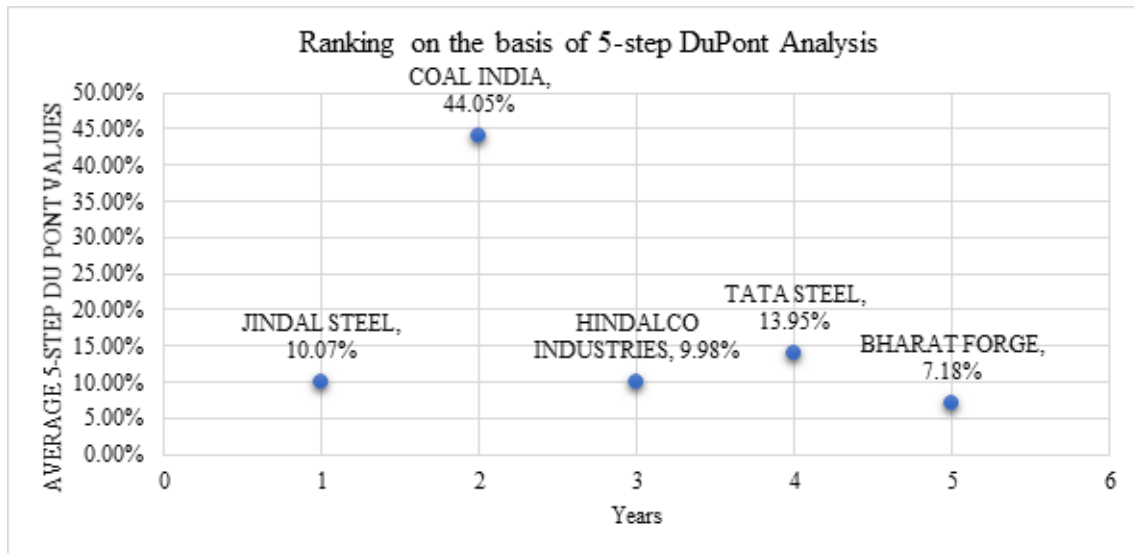
Figure 11. Comparative analysis of Debt to equity of steel companies from 2020-2023

**6.7 Ranking based on 3-Step DuPont Analysis**





## 6.8. Ranking based on 5-Step DuPont Analysis



listed earlier, we have come to the following conclusions: It is clear from analyzing the firms' liquidity ratios that not a single one of them keeps their current ratio at the ideal level of 2:1. Tata Steel has the lowest Current Ratio in 2023, according to the given figure, while Coal India has the highest.

A comparison of Hindalco Industries and Bharat Forge's profitability, activity turnover, asset turnover, leverage, and DuPont analyses reveals that both companies make good use of their resources to produce revenue, as their asset turnover ratios are relatively stable. When looking at price-earnings ratios, Jindal Steel is head and shoulders above the competition. As a result, of the three companies, Coal India has the strongest financial footing.

## 8. POLICY IMPLICATIONS & FUTURE SCOPE OF STUDY

The research's conclusions highlight the significance of a strong regulatory framework designed to meet the unique requirements of India's mining and metals sector. It is recommended that policymakers concentrate on simplifying regulations concerning environmental compliance, land acquisition, mineral exploration, and licensing to foster sustainable growth and reduce operational risks for businesses operating in this industry. The study highlights the significance of attracting investments into the metals and mining industry to foster technological innovation, infrastructure development, and capacity expansion. Policy interventions to incentivise domestic and foreign investments through tax incentives, investment-friendly policies, and infrastructure support can catalyze the sector's growth and enhance its global competitiveness.

Infrastructure bottlenecks such as inadequate transportation networks, power shortages, and

logistical challenges significantly impact metals and mining companies' operational efficiency and competitiveness. Policymakers should prioritize investments in infrastructure development, including the expansion of transportation networks, development of port facilities, and improvement of power supply to facilitate the movement of raw materials and finished products, reduce operational costs, and enhance the sector's overall competitiveness. Overall, the policy implications derived from this research underscore the importance of proactive policy interventions aimed at promoting sustainable growth, enhancing competitiveness, and addressing key challenges within India's metals and mining industry. By implementing targeted policy measures, policymakers can create an enabling environment conducive to the long-term prosperity and sustainability of the sector while maximizing its contribution to economic development and job creation.

In conclusion, the future scope of the study for an in-depth examination of the financial ratios of metals and mining companies in India is broad and multifaceted, encompassing longitudinal analysis, comparative studies, sectoral analyses, technological innovation, ESG integration, risk management practices, and policy evaluation. By exploring these avenues, researchers can deepen our understanding of the financial dynamics, challenges, and opportunities within the metals and mining industry, contributing to informed decision-making, sustainable development, and inclusive growth within the sector.

Extending the scope of the study to include a comparative analysis of the financial ratios of metals and mining companies across different regions, countries, or continents would facilitate benchmarking and identification of best practices. Comparative studies

would offer valuable insights into the factors driving variations in financial performance, regulatory frameworks, market structures, and industry dynamics, thereby enhancing our understanding of global trends and opportunities within the sector.

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