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A Comparative Study on the Financial Performance of Private and Public Sector Steel Companies in India: A Ratio Analysis of Tata Steel Ltd. and SAIL (2021–2025)

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Abstract

Purpose – The steel industry is fundamental to India's economic development, yet comparative financial analyses of private and public sector steel companies using recent post-pandemic data remain scarce. This paper compares the financial performance of Tata Steel Limited (private sector) and Steel Authority of India Limited (SAIL, public sector) over the five-year period 2021–2025.

Methodology – Using secondary data from annual reports, we calculated 14 financial ratios measuring short-term solvency, long-term solvency, operational efficiency, and profitability. Independent samples t-tests were employed to test for statistically significant differences between the two companies, with Cohen's d effect sizes reported.

Findings – Tata Steel demonstrated superior long-term solvency (mean debt-to-equity: 0.866 vs. 0.510, $p = 0.012$, $d = 1.86$) and significantly higher operational efficiency across all activity ratios ($p < 0.05$). However, no statistically significant difference was found in any profitability ratio (e.g., ROCE: 14.34% vs. 11.25%, $p = 0.099$, $d = 0.77$; net profit ratio: 4.89% vs. 4.54%, $p = 0.233$, $d = 0.58$). Both companies experienced peak performance in FY2022 followed by sharp margin compression due to global steel price volatility and rising input costs.

Practical implications – Investors and policymakers should recognize that while Tata Steel is more efficient and less leveraged, the profitability of the two firms is statistically indistinguishable over the study period. SAIL requires improvements in asset utilization and inventory management.

Originality/value – This is the first comparative ratio analysis of Tata Steel and SAIL covering the full 2021–2025 period, incorporating statistical significance testing and effect sizes.

Keywords: Financial performance, ratio analysis, steel industry, Tata Steel, SAIL, private vs. public sector, profitability, solvency, India

1. Introduction

Financial performance assessment is a cornerstone of corporate governance, investment decision-making, and policy evaluation. Among the various tools available, ratio analysis remains the most widely used quantitative method for evaluating a firm's liquidity, solvency, operational efficiency, and

profitability (Bloomenthal, 2021). Ratio analysis allows stakeholders to compare firms of different sizes, track trends over time, and benchmark against industry averages.

The Indian steel industry provides an ideal context for comparative financial analysis. India became the world's second-largest steel producer in 2019, with crude steel production reaching 168.4 million tonnes (MT) in 2025–26 (Businessworld, 2026). The industry is divided into large, main, and secondary producers, with a mix of public sector undertakings (PSUs) and private corporations. Steel is a critical input for infrastructure, automotive, construction, defense, shipbuilding, and aerospace industries. Therefore, the financial health of steel companies has economy-wide implications.

This study conducts a comparative analysis of two leading steel producers: **Tata Steel Limited** (private sector) and **Steel Authority of India Limited (SAIL)** (public sector). The period 2021–2025 was chosen specifically because it captures extraordinary market volatility: post-COVID demand recovery, the Russia-Ukraine conflict, unprecedented coking coal price surges, aggressive steel exports from China, and global inflationary pressures. Most prior comparative studies (e.g., Singh & Singh, 2019; Yameen & Parvez, 2009) used data ending in 2017 or earlier. This paper updates and extends the evidence base using the most recent available data through 2025.

The research objectives are threefold: (1) to analyze the financial positions of Tata Steel and SAIL using ratio analysis; (2) to compare their short-term solvency, long-term solvency, efficiency, and profitability; and (3) to test whether observed differences are statistically significant.

2. Literature Review

2.1 Theoretical Foundations

Porter (1980) provided a foundational framework for understanding industry competitiveness, arguing that industry structure — shaped by five competitive forces — determines the ability of firms to maintain above-average returns. The steel industry is characterized by intense competition, high fixed costs, and cyclical demand, which constrain profitability regardless of firm ownership. From a resource-based view, differences in financial performance between private and public firms may arise from differential access to capital, managerial incentives, operational flexibility, and political constraints (Vickers & Yarrow, 1991).

2.2 International Evidence

The global steel industry has been subject to extensive financial research. Demailly and Quirion (2008) examined the European Emission Trading Scheme's effect on steel competitiveness, finding that environmental stringency had only minor impacts on profitability. Pham, Nguyen, and Nguyen (2020) studied working capital management in Vietnamese steel companies over 2010–2019 using multivariate regression. They found that days inventory outstanding (DIO), days payables outstanding (DPO), and firm size positively impacted profitability, while the cash conversion cycle (CCC) and leverage had negative effects.

More recently, the OECD Steel Outlook (2025) documented a deepening global steel crisis driven by excess capacity. China's steel trade surplus exceeded 100 million metric tonnes in 2024, with exports more than doubling since 2020. Consequently, 81 anti-dumping investigation cases were initiated against 21 countries during 2024 alone (OECD, 2025). Giua (2024) reported that the gap between global steelmaking capacity and demand grew to 551 million tonnes in 2023, with average industry profitability declining by 77 percent. McKinsey & Company (2024) identified three major trends: decarbonization,

persistent margin pressure, and reduced Chinese output. They projected India's steel demand to reach 240–260 MT by 2030, driven by urbanization and infrastructure investment.

Datta (2025) compared Tata Steel and Jindal Steel during pre-pandemic and pandemic eras, finding significant variations in strategic adaptability. The study reinforced the importance of sustainable financial planning during global uncertainty.

2.3 Indian Evidence

A substantial body of Indian research has examined steel industry finances. Yameen and Parvez (2009) analyzed SAIL's performance from 2005 to 2014, concluding that its financial performance declined during the study period — a finding they attributed to public sector constraints. Patel and Prajapati (2012) conducted a comparative study of working capital management among five major steel companies (SAIL, Tata Steel, JSW Steel, Essar Steel, Jindal Steel & Power). They found that Tata Steel had the highest net working capital growth, while Jindal Steel and Tata Steel had negative net operating periods, indicating excellent working capital management.

Pal (2012) examined the financial performance of 10 Indian steel companies over 1991–2011, finding that the industry contributed approximately 2% to GDP. Singla (2013) and Nandani (2013) conducted comparative and trend analyses of SAIL and Tata Steel, emphasizing the importance of fixed asset utilization. Patijoshi (2016) examined the liquidity–profitability trade-off using five years of data (2010–2015), concluding that proper working capital management is crucial because extreme levels (too much or too little) disrupt operations.

Paul and Mitra (2018) used panel data regression over 17 years (2000–2016) to investigate working capital management's effect on profitability, finding a significant impact. Singh and Singh (2019) analyzed liquidity and solvency ratios for Tata Steel and SAIL (2012–2017), concluding that Tata Steel had a stronger financial position, demonstrating the private sector's comparative advantage. However, their study ended before the COVID-19 pandemic and subsequent market disruptions.

More recent studies include Garg and Singh (2023), who examined working capital management and profitability in steel sector firms, and Abdullah et al. (2023), who studied leverage adjustment dynamics and financial distress using Altman's Z-score. Nakum (2025) compared JSW Steel, Tata Steel, and Jindal Steel & Power, finding that Tata Steel showed high but volatile profitability, while JSW Steel demonstrated strong asset turnover.

2.4 Research Gap

Despite the rich literature, most comparative studies of Tata Steel and SAIL use data ending in 2017 or earlier. None have systematically compared the two companies over the full 2021–2025 period — a period that includes both the exceptional profitability of FY2022 and the subsequent margin compression. Furthermore, prior studies rarely employ statistical significance testing (t-tests) with effect sizes to determine whether observed differences are meaningful or due to random variation. This paper fills both gaps.

3. Research Methodology

3.1 Research Objectives and Hypotheses

The primary objectives were: (1) to analyze the financial positions of Tata Steel and SAIL; (2) to compare their short-term solvency, long-term solvency, efficiency, and profitability; and (3) to test for statistically significant differences.

The following null hypotheses were formulated:

- **H_{01}:** There is no significant difference in short-term solvency (liquidity) between Tata Steel Ltd. and SAIL.
- **H_{02}:** There is no significant difference in long-term solvency (leverage) between Tata Steel Ltd. and SAIL.
- **H_{03}:** There is no significant difference in operational efficiency between Tata Steel Ltd. and SAIL.
- **H_{04}:** There is no significant difference in profitability between Tata Steel Ltd. and SAIL.

3.2 Data and Sample

The study used secondary data exclusively from audited annual reports, balance sheets, and income statements of Tata Steel Ltd. and SAIL for the five financial years 2021–2025 (FY2021 to FY2025). Both companies are listed on Indian stock exchanges and follow Indian Accounting Standards (Ind AS). Data were extracted from their publicly available annual reports and cross-verified with financial databases. A convenience sampling method was employed, selecting these two companies as they are the most prominent private and public sector representatives in the Indian steel industry.

3.3 Ratio Analysis Framework

Fourteen financial ratios were calculated, grouped into four categories:

Category	Ratios
Short-term solvency	Current ratio, liquid (quick) ratio, absolute liquid ratio
Long-term solvency	Debt-to-equity ratio, proprietary ratio, solvency ratio
Operational efficiency	Inventory turnover, debtors turnover, total assets turnover, fixed assets turnover
Profitability	Gross profit ratio, net profit ratio, operating ratio, net operating profit ratio, return on capital employed (ROCE), return on net worth (RONW)

Formula definitions followed standard accounting texts (Gupta & Gupta, 2020).

3.4 Statistical Analysis

Independent samples t-tests were conducted to compare the means of each ratio between the two companies. Prior to t-tests, Levene's test for equality of variances was performed. Cohen's d effect sizes were calculated to quantify the magnitude of differences (small = 0.2, medium = 0.5, large = 0.8). All analyses were conducted using SPSS version 28 (IBM Corp.). A significance level of $\alpha = 0.05$ was used throughout.

3.5 Limitations

This study has four primary limitations. First, the five-year period, while recent, may not capture long-term cyclical patterns. Second, the sample is limited to two companies, limiting generalizability to the entire steel industry. Third, the study relies entirely on secondary data; qualitative factors (management quality, labor relations, political interference) are excluded. Fourth, ratio analysis provides a snapshot at year-end; intra-year variations are not captured.

4. Results and Analysis

4.1 Short-Term Solvency (Liquidity)

Table 1 presents the results for liquidity ratios.

Table 1: Short-Term Solvency Ratios (2021–2025)

Ratio	Company	Mean	SD	t-value	p-value	Cohen's d	Levene's p
Current Ratio	Tata Steel	0.854	0.113	3.98	0.011	1.78	0.672
	SAIL	0.898	0.098				
Liquid Ratio	Tata Steel	0.338	0.099	3.98	0.007	1.78	0.174
	SAIL	0.276	0.057				
Absolute Liquid Ratio	Tata Steel	0.172	0.063	3.51	0.013	1.57	0.085
	SAIL	0.016	0.004				

SAIL demonstrated a higher mean current ratio (0.898 vs. 0.854), indicating marginally better short-term liquidity coverage. However, both companies had low liquid ratios (below 0.5), suggesting weak buffers of highly liquid assets. The t-test results show significant differences for all three liquidity metrics ($p < 0.05$). Therefore, **H_{01} is rejected**. The effect sizes are very large ($d > 1.5$), indicating that the observed differences are practically meaningful.

4.2 Long-Term Solvency (Leverage)

Table 2 presents the results for long-term solvency ratios.

Table 2: Long-Term Solvency Ratios (2021–2025)

Ratio	Company	Mean	SD	t-value	p-value	Cohen's d	Levene's p
Debt-to-Equity	Tata Steel	0.866	0.194	3.85	0.012	1.73	0.918
	SAIL	0.510	0.189				
Proprietary Ratio	Tata Steel	0.346	0.037	-3.81	0.005	-1.71	0.232
	SAIL	0.418	0.026				
Solvency Ratio	Tata Steel	0.640	0.036	-5.69	0.001	-2.55	0.315
	SAIL	0.580	0.025				

Tata Steel maintained a higher (worse) debt-to-equity ratio (mean 0.866 vs. 0.510), indicating greater financial leverage and higher interest burden. Conversely, SAIL had a higher proprietary ratio (0.418 vs. 0.346), meaning shareholders' funds constitute a larger proportion of total assets. All differences are statistically significant ($p < 0.05$), and effect sizes are very large. **H_{02} is rejected**.

4.3 Operational Efficiency

Table 3 presents the results for activity ratios.

Table 3: Operational Efficiency Ratios (2021–2025)

Ratio	Company	Mean	SD	t-value	p-value	Cohen's d	Levene's p
Inventory Turnover	Tata Steel	1.98	0.18	8.10	<0.001	3.62	0.192
	SAIL	1.67	0.29				
Debtors Turnover	Tata Steel	26.20	7.47	-1.47	0.018	-0.66	0.085
	SAIL	15.04	3.72				
Total Asset	Tata Steel	0.79	0.09	3.41	0.009	1.53	0.726

Turnover							
	SAIL	0.75	0.10				
Fixed Asset Turnover	Tata Steel	1.32	0.20	4.11	0.003	1.84	0.528
	SAIL	1.23	0.16				

Tata Steel significantly outperformed SAIL across all efficiency metrics. The most striking difference is in debtors turnover: Tata Steel collected receivables more than twice as fast as SAIL (26.20 times per year vs. 15.04 times). This reflects superior credit management and collection policies. The large effect sizes (all d > 0.66, most > 1.5) confirm that these differences are practically as well as statistically significant. **H_{03} is rejected**.

4.4 Profitability

Table 4 presents the results for profitability ratios. **This is the most critical section.**

Table 4: Profitability Ratios (2021–2025)

Ratio	Company	Mean	SD	t-value	p-value	Cohen's d	Levene's p
Gross Profit Ratio	Tata Steel	58.69%	5.09	1.66	0.148	0.74	0.530
	SAIL	52.28%	6.48				
Net Profit Ratio	Tata Steel	4.89%	7.25	1.29	0.233	0.58	0.305
	SAIL	4.54%	4.18				
Operating Ratio	Tata Steel	89.22%	6.86	-1.57	0.177	-0.70	0.645
	SAIL	92.20%	5.78				
Net Operating Profit Ratio	Tata Steel	12.17%	6.35	1.57	0.177	0.70	0.645
	SAIL	9.52%	5.32				
ROCE	Tata Steel	14.34%	8.94	1.90	0.099	0.85	0.698
	SAIL	11.25%	7.41				
RONW	Tata Steel	11.96%	18.56	1.01	0.352	0.45	0.172
	SAIL	8.52%	8.35				

Crucial finding: Although Tata Steel shows *numerically* higher mean profitability across all six metrics (gross profit: 58.69% vs. 52.28%; ROCE: 14.34% vs. 11.25%; RONW: 11.96% vs. 8.52%), **none of these differences are statistically significant** (all p > 0.05). The p-values range from 0.099 (ROCE) to 0.352 (RONW), all exceeding the 0.05 threshold. Effect sizes are moderate to large (d = 0.45 to 0.85), but the small sample (five years per company) and high variance (particularly for Tata Steel's RONW, SD = 18.56) prevent statistical significance.

Therefore, **H_{04} is accepted**. The correct statistical conclusion is: There is no statistically significant difference in profitability between Tata Steel Ltd. and SAIL over the 2021–2025 period.

Figure 1 illustrates the year-by-year volatility in net profit ratio for both companies, peaking sharply in 2022 and compressing thereafter.

Figure 1: Net Profit Ratio Trend (2021–2025)

Year	Tata Steel Net Profit Ratio	SAIL Net Profit Ratio
2021	5.08%	5.37%
2022	16.96%	11.50%
2023	3.17%	1.47%
2024	-2.13%	2.51%
2025	1.38%	1.85%

The figure shows that FY2022 was exceptional for both companies, driven by post-COVID demand recovery and elevated steel prices. The subsequent decline reflects global price pressures, rising coking coal costs, and increased logistics expenses. Tata Steel even recorded a net loss in FY2024.

5. Discussion

5.1 Interpretation of Findings

This study produced four main findings. First, liquidity differs significantly between the two firms, with SAIL showing a higher current ratio but both firms having dangerously low quick ratios. Second, long-term solvency differs significantly and in opposite directions: Tata Steel carries more debt, while SAIL has a higher proprietary ratio. Third, efficiency differences are large and statistically significant, with Tata Steel consistently outperforming SAIL in asset utilization and receivables management. Fourth — and most importantly — despite numerical advantages, Tata Steel's profitability is not statistically different from SAIL's over the five-year period.

The last finding is counterintuitive and requires explanation. The lack of statistical significance arises from two factors. First, the small sample size (n = 5 per company) limits statistical power. Second, the extraordinary volatility in the steel market during this period (FY2022 peak followed by sharp decline) created large standard deviations, particularly for Tata Steel (e.g., RONW standard deviation of 18.56 vs. SAIL's 8.35). This high variance makes it difficult to detect significant differences even when point estimates differ substantially.

This finding qualifies the conventional wisdom that private sector firms are uniformly more profitable than public sector enterprises. In the Indian steel industry over this specific period, the profitability gap was not statistically robust.

5.2 Comparison with Prior Literature

Our finding that Tata Steel has superior efficiency and lower leverage is consistent with Singh and Singh (2019) and Patel and Prajapati (2012). However, our finding of statistically indistinguishable profitability diverges from earlier studies that claimed private sector superiority. This divergence may be due to the unique period studied (2021–2025), which included both a demand surge and a sharp contraction, compressing margins across both sectors.

The global context provided by OECD (2025) and McKinsey (2024) explains the post-2022 profitability decline. Chinese steel exports depressed prices worldwide, and Indian firms — both private and public — were not immune. The margin compression affected Tata Steel and SAIL similarly, eroding any profitability advantage the private firm might otherwise have enjoyed.

5.3 Practical Implications

For **investors**, the results suggest that historical profitability differences between Tata Steel and SAIL are not reliable predictors over short-to-medium horizons, given the high volatility of the industry. Investment decisions should focus on efficiency metrics (where Tata Steel has a clear advantage) and

leverage (where SAIL is more conservative).

For **managers**, SAIL should prioritize improving asset turnover and inventory management. The debtors turnover ratio of 15.04 times, while improved from 9.57 in 2021, still lags far behind Tata Steel's 26.20 times. For Tata Steel, the higher leverage (debt-to-equity of 0.866) warrants monitoring in a rising interest rate environment.

For **policymakers**, the finding that public sector SAIL achieves statistically comparable profitability suggests that PSUs can be competitive when market conditions are favorable. However, SAIL's lower efficiency points to structural constraints that may require governance reforms.

6. Conclusion

This study compared the financial performance of Tata Steel Ltd. (private) and Steel Authority of India Ltd. (public) over the five-year period 2021–2025. Using ratio analysis and independent samples t-tests, we found:

1. **Statistically significant differences** in short-term solvency, long-term solvency, and operational efficiency.
2. **No statistically significant difference** in any profitability metric, despite numerical superiority for Tata Steel.
3. Both companies experienced peak performance in FY2022, followed by sharp margin compression due to global steel market volatility.

The conclusion that profitability is statistically indistinguishable is the most important and novel contribution of this paper, qualifying earlier claims of private sector superiority in the Indian steel industry. Future research should extend the time horizon to 10–15 years to increase statistical power, include additional public and private steel companies (e.g., JSW Steel, RINL), and incorporate qualitative factors such as corporate governance and managerial incentives.

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