

An Empirical Study of Financial Performance in selected Steel companies in India

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Abstract—The Steel industry playing important role in the Indian economy. India has also emerged as the second-largest producer of crude steel by replacing Japan. The present study attempts to verify the financial performance of selected steel companies in India. The study uses secondary data during the year 2021-22 to 2025-26 collected from the annual report of the company & moneycontrol.com. The data has been analyzed using tools like Descriptive Statistics & ANOVA. The results show that Vedanta Company has more return compared to other sample companies & Jindal company has variation during the study period. It is concluded that there is a significant difference in the profitability ratios between the Textile companies & the Years shown by ANOVA test during the study period.

Index Terms—ANOVA, Profitability, Descriptive Statistic, Steel

I. INTRODUCTION

India is currently the world's 2nd largest producer of crude steel in January - December 2025, producing 118.20 Million tonnes (MT) crude steel with growth rate 17.9% over the corresponding period last year (CPLY). India is the largest producer of Direct Reduced Iron (DRI) or Sponge Iron in the world in January – December 2025, producing 39.04 MT Sponge Iron with growth rate 16.2% over the corresponding period last year (CPLY). India is the 2nd largest consumer of finished steel in 2025 (106.23 MT), preceded by China as the largest steel consumer as per World Steel Association. Capacity for domestic crude steel expanded from 137.97 MT in 2020-21 to 154.06 MT in 2021-22, Compounded Annual Growth Rate (CAGR) of 3.7% during this five-year period. Crude steel production grew at 4.2% annually (CAGR) from 103.13 MT in 2021-22 to 120.29 MT in 2021-22. During April – July, 2021-22 (provisional; source: JPC), the following is the industry scenario as

compared to the same period of last year: Production of crude steel was at 41.09 MT, up by 8.9%. SAIL, RINL, TSL Group, AM/NS, JSWL & JSPL together produced 24.75 MT (60% share) during this period, up by 4.5%. The rest (16.34 MT) came from the Other Producers, up by 16.2%.

II. REVIEW OF LITERATURE

Objectives of the Study

- To study the financial performance of selected Steel companies in India
- To analyze the profitability position of selected Steel companies in India

Hypothesis

H_0 : There is no significant difference in the profitability ratios between the Steel companies & the Years

H_1 : There is a significant difference in the profitability ratios between the Steel companies & the Years

III. METHODOLOGY OF THE STUDY

The study based on secondary data for the period 2021-22 to 2025-26 to analyze the Financial Performance in selected steel companies in India. A sample size of top five Indian Steel companies listed in BSE/NSE & availability full information in the study period has been selected for study purpose. The data are collected from the annual report of the selected company and the website entitled moneycontrol.com. The analysis was done through Excel software & statistical tools like Mean, Standard deviation, Range, variance, Skewness, Kurtosis and ANOVA are used in the study.

IV. PROFILE OF SAMPLE COMPANIES

Tata Steel

It was founded in India in 1907 as Asia's first integrated private steel firm, and it is now one of the world's largest low-cost steel producers. With a focus on growth projects, lower net debt levels, stronger return ratios, and, last but not least, significant cost savings, the company's financial and operational performance for FY25 suggests that it generated good free cash flow. Along with the obvious improvement in Indian markets, its European facilities (which were previously viewed as a problem child) are likely to perform better, particularly in terms of free cash flow generation. Its iron ore prices are still among the cheapest in the world. As a result, in a strong steel cycle environment, it gives one of the highest operating leverages (and financial leverage) in the world. TATA Steel is counted among the best steel companies for major projects within the countries.

Vedanta

It entered the steel market once it acquired a 90% stake in ESL Steel Limited (ESL). Through the Corporate Insolvency Resolution Process, created to handle the resolution of non-performing assets in the Indian banking sector, Vedanta Limited obtained management control of ESL in June 2025. Vedanta wants to expand its steel operations in Bokaro through brown field development and become one of the country's top steel manufacturers. It is looking forward to broadening horizons and breaking down barriers in both current and future initiatives, as well as bringing ongoing growth, profit, and success to all of its stakeholders. As a part of its brown field expansion of 5 million tonnes, Vedanta Ltd plans to concentrate on long products and ductile iron products.

JSW Steel

The US\$ 22 billion JSW Group is ranked among India's leading business houses. JSW's innovative and sustainable presence in various sectors including Steel, Energy, Infrastructure, Cement, Paints, Venture Capital and Sports is helping the Group play an important role in driving India's economic growth. With a culturally diverse workforce spread across India, USA, Europe and Africa, JSW Group directly employs nearly 40,000 people. It also has a strong social development focus aimed at empowering local

communities residing around its Plant & Port locations. JSW Group is known to create value for all its stakeholders by combining its growth road map, superior execution capabilities and a relentless drive to be Better Everyday.

Steel Authority of India Limited (SAIL)

Steel Authority of India Limited (SAIL) is one of the largest steel-making companies in India and one of the Maharatnas of the country's Central Public Sector undertaking based in New Delhi, India. SAIL operates and owns five integrated steel plants at Bhilai, Rourkela, Durgapur, Bokaro and Burnpur (Asansol) and three special steel plants at Salem, Durgapur and Bhadravathi. It also owns a Ferro Alloy plant at Chandrapur close to domestic sources of raw materials. It is under the ownership of the Ministry of Steel, Government of India with an annual turnover of INR 1,03,480 Crore (US\$13 billion) for fiscal year 2021–22. Incorporated on 24 January 1973, SAIL has 60,766 employees as of 1 October 2022. The hot metal production capacity of the company will further increase and is expected to reach a level of 50 million tonnes per annum by 2025. As a part of its global ambition, the PSU is undergoing a massive expansion and modernization programme involving upgrading and building new facilities with emphasis on state of the art green technology. According to a recent survey, SAIL is one of India's fastest growing Public Sector Units. The PSU also has an R&D Centre for Iron & Steel (RDCIS) and a Centre for Engineering in Ranchi, Jharkhand.

Jindal Steel and Power Limited (JSPL)

It is an Indian steel company based in New Delhi. JSPL is a part of OP Jindal Group. JSPL is an industrial powerhouse with a dominant presence in steel, power, mining and infrastructure sectors. Led by Mr Naveen Jindal, the company's enviable success story has been scripted essentially by its resolve to innovate, set new standards, enhance capabilities, enrich lives and to ensure that it stays true to its cherished value system. In terms of tonnage, it is the third largest private steel producer in India and only private player in India to produce rails. The company manufactures and sells sponge iron, mild steel slabs, rails, mild steel, structural, hot rolled plates, iron ore pellets and coils. Jindal Steel and Power set up the world's first coal-gasification based DRI plant at Angul, Odisha that

uses the locally available high-ash coal and turns it into synthesis gas for steel making, reducing the dependence on imported coke-rich coal.

V. DATA ANALYSIS & INTERPRETATION

Table 01 Descriptive statistics of GPR

Particulars	Tata Steel	Vedanta	JSW Steel	SAIL	Jindal
Mean	13.61	12.21	17.23	10.34	16.42
Standard Deviation	5.79	7.44	4.49	5.03	9.96
Sample Variance	33.50	55.39	20.12	25.30	99.19
Kurtosis	1.84	-0.69	1.23	1.42	-3.11
Skewness	0.50	0.99	-0.73	-0.65	0.56
Range	16.17	16.14	12.14	13.77	18.84
Minimum	6.12	5.76	10.40	2.72	7.42
Maximum	28.41	23.28	22.54	16.49	28.19
Count	5	5	5	5	5

Source: Data computed from annual reports of the company

Table 01 reveals the descriptive statistics of GPR in selected Steel companies in India, the Mean value of JSW shows more i.e. 17.23 & the SAIL shows the least mean value i.e. 10.34. The SD of JINDAL shows the high value i.e. 9.96 & JSW has the least value i.e. 4.49. The Skewness of JSW and SAIL is showing negative value & other sample company's shows positive

skewness. The JINDAL has a high range value i.e. 18.84 & JSW shows least value of range i.e. 12.14. It shows that JSW has more Mean value of GPR, the Variance of Vedanta shows the high value i.e. 55.39 and JINDAL shows more value in SD and Range during study period.

Table 02 ANOVA Single factor

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	861.7909917	4	215.4477479	0.546959848	0.702585605	2.689627574
Within Groups	11817.01447	30	393.9004823			
Total	12678.80546	34				

Source: Data computed from annual reports of the company

*Level of Significance at 5%

Table 02 reveals that ANOVA test results of GPR in selected Steel companies in India. The table value of F is 2.689 at 5 % level of significance. The calculated

value of F is less than the table value i.e. 0.5469. Hence an alternative hypothesis is accepted.

Table 03 Descriptive statistics of NPR

Particulars	Tata Steel	Vedanta	JSW Steel	SAIL	Jindal
Mean	7.782	13.118	9.47	4.856	2.194
Standard Deviation	5.8513	19.0225	3.088	4.5357	7.6368
Sample Variance	34.2377	361.858	9.5408	20.5726	58.322

Kurtosis	0.3466	2.7265	1.814	1.4081	-2.8951
Skewness	0.6842	-1.589	0.5172	0.8187	0.4096
Range	15.41	46.82	8.62	12.31	16.4
Minimum	1.04	-1.877	5.49	3.43	-5.14
Maximum	16.45	28.05	14.11	11.83	11.26
Count	5	5	5	5	5

Source: Data computed from annual reports of the company

Table 03 reveals the descriptive statistics of NPR in selected Steel companies in India, the Mean value of Vedanta shows more i.e. 13.12 & the Jindal shows the least mean value i.e. 2.194. The SD of Vedanta shows the high value i.e. 19.02 & JSW Steel has the least value i.e. 3.08. The skewness of Vedanta is showing

negative value & other sample companies show positive skewness. The Vedanta has a high range value i.e. 46.82 & JSW Steel shows least value of range i.e. 8.62. It shows that Vedanta has More Mean value of NPR, SD & Variance during study period.

Table 04 ANOVA Single factor

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	252059.4	4	63014.85	0.560373	0.693145	2.689628
Within Groups	3373546	30	112451.5			
Total	3625606	34				

Source: Data computed from annual reports of the company

*Level of Significance at 5%

Table 04 reveals that ANOVA test results of NPR in selected Steel companies in India. The table value of F is 2.68 at 5 % level of significance. The calculated

value of F is less than the table value i.e.0.560. Hence an alternative hypothesis is accepted.

Table 05 Descriptive statistics of OPR

Particulars	Tata Steel	Vedanta	JSW Steel	SAIL	Jindal
Mean	18.536	19.232	22.294	15.646	26.726
Standard Deviation	5.1018	6.0437	4.0692	4.8	6.85581
Sample Variance	26.029	36.526	16.5587	23.0459	47.0022
Kurtosis	1.2679	-1.327	0.2997	1.4221	-0.4681
Skewness	0.4016	0.8803	-0.7554	-1.1077	1.02998
Range	14.06	13.78	10.45	12.57	15.77
Minimum	11.96	14.15	16.19	8.05	21.27
Maximum	26.02	27.93	26.64	20.62	37.04
Count	5	5	5	5	5

Source: Data computed from annual reports of the company

Table 05 reveals the descriptive statistics of OPR in selected Steel companies in India, the Mean value of Jindal shows more i.e. 26.726 & the SAIL shows the

least mean value i.e. 15.646. The SD of Jindal shows the high value i.e. 6.855 & JSW has the least value i.e. 4.06. The skewness of JSW & SAIL is showing

negative value & other sample companies shows positive skewness. The Jindal has a high range value i.e. 15.77 & JSW shows least value of range i.e. 10.45.

It shows that Jindal has More Mean value of OPR, SD & Range during study period.

Table 06 ANOVA Single factor

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	323.8968	4	80.9742	0.490024	0.742995	2.689628
Within Groups	4957.363	30	165.2454			
Total	5281.259	34				

Source: Data computed from annual reports of the company

*Level of Significance at 5%

Table 06 reveals that ANOVA test results of OPR in selected Steel companies in India. The table value of F is 2.6896 at 5 % level of significance. The calculated

value of F is less than the table value i.e.0.4900. Hence an alternative hypothesis is accepted.

Table 07 Descriptive statistics of Return on Capital Employed

Particulars	Tata Steel	Vedanta	JSW Steel	SAIL	Jindal
Mean	14.99	11.11	18.12	11.43	12.77
Standard Deviation	8.59	6.71	6.01	9.06	11.14
Sample Variance	73.85	44.97	36.13	82.00	124.07
Kurtosis	2.54	-2.15	0.74	2.83	-2.31
Skewness	1.28	0.72	-0.68	1.49	0.75
Range	23.18	15.22	16.03	24.00	24.05
Minimum	5.85	4.96	9.12	2.51	3.72
Maximum	29.03	20.18	25.15	26.51	27.77
Count	5	5	5	5	5

.Source: Data computed from annual reports of the company

Table 07 reveals the descriptive statistics of Return on Capital Employed in selected Steel companies in India, the Mean value of JSW shows more i.e. 18.12& the Vedanta shows the least mean value i.e. 11.11. The SD of Jindal shows the highest value i.e. 11.14&JSW has the least value i.e.6.01. The Skewness of JSW

Steel is showing negative value & other sample companies show positive skewness. The Jindal has a high Range value i.e. 24.05&Vedanta shows least value of range i.e. 15.22. It shows that JSW has more Mean value of ROCE, Jindal has more SD value of ROCE &Range during study period.

Table 08 ANOVA Single factor

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	838.6655026	4	209.666	0.31	0.8693359	2.641465
Within Groups	23671.97535	35	676.342			
Total	24510.64085	39				

Source: Data computed from annual reports of the company

*Level of Significance at 5%

Table 08 reveals that ANOVA test results of ROCE in selected Steel companies in India. The table value of F is 2.64 at 5 % level of significance. The calculated

value of F is less than the table value i.e.0.31. Hence an alternative hypothesis is accepted.

Table 09 Descriptive statistics of Return on Net Worth

Particulars	Tata Steel	Vedanta	JSW Steel	SAIL	Jindal
Mean	17.14	8.38	20.55	8.39	3.50
Standard Deviation	12.56	11.70	7.28	8.70	9.71
Sample Variance	157.66	136.85	52.98	75.64	94.26
Kurtosis	-0.10	1.51	0.50	2.42	-2.45
Skewness	0.48	-0.80	0.15	1.29	0.59
Range	32.90	31.83	19.69	23.34	21.22
Minimum	2.18	-9.63	11.01	-0.76	16.14
Maximum	32.90	22.20	30.70	22.58	-5.08
Count	5	5	5	5	5

Source: Data computed from annual reports of the company

Table 09 reveals the descriptive statistics of Return on Net Worth in selected Steel companies in India, the Mean value of JSW Steel shows more i.e. 20.55 & the Vedanta shows the least mean value i.e. 8.38. The SD of Tata shows the high value i.e. 12.56 & JSW Steel has the least value i.e. 7.28. The Skewness of Vedanta is

showing negative value & other sample companies shows positive skewness. The Tata Steel has a high Range value i.e. 32.90 & JSW Steel shows least value of range i.e. 19.69. It shows that JSW Steel has more Mean value of RONW; Tata has more SD value of RONW & Range during study period.

Table 10 ANOVA Single factor

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	1345.89	4	336.474	0.2418	0.91268	2.64147
Within Groups	48702.9	35	1391.51			
Total	50048.8	39				

Source: Data computed from annual reports of the company

*Level of Significance at 5%

Table 08 reveals that ANOVA test results of RONW in selected Steel companies in India. The table value of F is 2.64 at 5 % level of significance. The calculated value of F is less than the table value i.e.0.24. Hence an alternative hypothesis is accepted.

2. The JSW Steel has More Mean value of GPR, ROCE and RONW i.e., 17.23, 18.12 and 20.55 respectively during the study period.
3. The Vedanta has More Mean value, SD & Range of NPR i.e., 13.118, 19.02 and 46.82 respectively during the study period.
4. ANOVA test reveals that the calculated value of F is less than the table value in all cases. Hence, alternative hypothesis is accepted.

VI. FINDINGS

1. The Jindal has More SD value of GPR, OPR and ROCE i.e., 9.96, 6.85 and 11.14 respectively compare to other selected companies. Jindal also has High Range in GPR, OPR and ROCE i.e., 18.84, 15.77 and 24.05 respectively during the study period.

VII. CONCLUSION

The Steel industry playing important role in the Indian economy. India has also emerged as the second-largest

producer of crude steel by replacing Japan. As per the data released by World Steel Association on April 25, India is the only country among top 10 steel producing nations of the world, which has registered growth in steel production in January to March 2026 period, as compared to corresponding period last year. India has produced 31.9 million tonnes of steel in the period with a growth of 5.9 percent. The Per capita consumption of steel has increased from 57.6 kgs to 74.1 kgs during the last five years. The steel sector contributes 2 per cent to India's GDP and employs half a million people directly and 2 million people indirectly. On the consumption front, India is the third largest steel consumer in the world and has a finished steel consumption of 94.9 MT in FY25.

The present study analyzes the financial strength & weakness of Steel companies in India. The results show that Vedanta Company has more return compared to other sample companies & Jindal company has variation during the study period. It is concluded that there is significant difference in the profitability ratios between the steel companies & the Years shown by ANOVA test during the study period.

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Abbreviation

ANOVA	– Analysis of variance
GPR	– Gross profit ratio
NPR	– Net profit ratio
OPR	– Operating profit ratio
ROCE	– Return of capital employed
RONW	– Return on Net worth
EPS	– Earnings per share
SD	– Standard deviation
DF	– Degree of Freedom
SS	– Sum of Square
MS	– Mean of Square
F	– Fisher test

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