

"A Study on Evaluating Growth Dynamics in the Indian Steel Industry: A Quantitative Approach"

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ABSTRACT

This study presents an in-depth evaluation of strategic performance within the Indian steel industry through the use of the QGV Composite Framework, which integrates three key dimensions: Quality (Q-Factor), Growth (G-Factor), and Valuation (V-Factor). The analysis focuses on five leading steel producers Tata Steel Ltd., JSW Steel Ltd., Steel Authority of India Ltd. (SAIL), Jindal Steel & Power Ltd. (JSPL), and ArcelorMittal Nippon Steel India Ltd. (AMNS) covering the period from 2016 to 2024. By employing a weighted and standardized scoring model, the framework measures each company's operational efficiency, governance effectiveness, and market valuation over time.

Findings reveal that the years 2018–2019 marked the industry's strongest overall performance, while the post-2020 period saw a decline driven largely by broader macroeconomic disruptions. Among the firms, JSW Steel demonstrated the most consistent performance, whereas AMNS and JSPL exhibited greater volatility and structural challenges. The QGV-based M-Score emerges as a valuable benchmarking tool, providing strategic insights for assessing competitiveness in capital-intensive sectors. The study concludes that companies with stronger governance (high G-Factor), lower risk exposure (low V-Factor), and balanced quantitative performance (Q-Factor) tend to achieve higher M-Scores. Notably, SAIL leads the rankings due to its robust governance and stable risk profile, while JSW Steel, despite strong quantitative indicators, ranks lower because of its comparatively weaker governance and higher risk exposure.

Keywords: *QGV Framework, Indian Steel Industry, Composite Scoring, Financial Performance, M-Score Analysis*

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INTRODUCTION

The Indian steel industry, a fundamental pillar of the nation's industrial progress, has experienced profound change over the last ten years. Amid shifting global demand, evolving government policies, and the disruptions brought on by the pandemic, assessing the strategic performance of steel firms requires a broader, more nuanced perspective. This study introduces the QGV Composite Framework an integrated model that evaluates companies across three vital dimensions: Quality (Q-Factor), Growth (G-Factor), and Valuation (V-Factor). By analysing five major steel players Tata Steel, JSW Steel, SAIL, JSPL, and ArcelorMittal Nippon Steel India—

over the period 2016 to 2024, the research aims to reveal performance trends, strategic turning points and patterns in investor sentiment. Leveraging standardized financial indicators weighted according to their importance, the framework enables comparative benchmarking as well as longitudinal insight into operational resilience, governance effectiveness and market perception.

REVIEW OF LITERATURE

The evaluation of industrial firm performance has long relied on frameworks that integrate financial, operational and market-based indicators. Traditional models such as DuPont Analysis and Altman's Z-Score (Altman, 1968) have been instrumental in assessing financial stability. However, they often lack the sector-specific focus and detailed granularity needed to generate nuanced insights — especially in capital-intensive industries like steel. To fill this gap, composite scoring models have become increasingly prominent, offering a more holistic perspective on firm performance.

Empirical research supports the integration of multiple financial dimensions within such models: for example, Kumar and Sharma (2019) highlighted the importance of quality indicators such as Net Profit Margin and Cash Flow from Operations (CFO) to assess the sustainability of earnings; similarly, Gupta and Jain (2020) underlined governance-oriented metrics — including Return on Equity (ROE) and EBITDA growth — as key indicators of strategic and managerial effectiveness. From a market viewpoint, valuation metrics such as Price-to-Earnings (P/E), Price-to-Book (P/B) and Dividend Yield have been shown to capture investor sentiment and longer-term performance trends (Singh & Mehta, 2021).

The Indian steel industry with its cyclical demand patterns and high capital intensity presents distinctive challenges for firm-level benchmarking. Previous studies by Raghavan (2018) and Deshmukh (2020) explored efficiency and leverage structures in the sector, but did not propose a unified measurement system. The QGV model addresses this gap by integrating three dimensions: Quality (Q), Governance (G) and Valuation (V) into a composite metric, the so-called M-Score, which enables both cross-sectional and longitudinal analysis of firms. Recent research also emphasises the impact of macroeconomic disruptions most notably the COVID-19 pandemic on profitability and investor confidence (Chatterjee & Roy, 2021). This aligns with observed declines in ROE and CFO across major Indian steel firms after 2020. Moreover, institutional shareholding patterns are emerging as reliable proxies for governance strength and market trust (Bansal & Verma, 2022).

OBJECTIVES OF THE STUDY

1. To construct and apply a QGV-based composite scoring model.
2. To perform a comparative analysis of five major steel firms.
3. To Study temporal performance trends and strategic inflection.

METHODOLOGY

The study is based entirely on secondary data, collected over nine years from the Prowess database. It uses the M-Score, which is built around a three-factor model consisting of the Q (Quality), G (Governance/Growth) and V (Valuation) factors. Each company receives a score out of 100 in the Q-Factor interval, reflecting the company's financial strength, the quality and sustainability of its earnings. Specifically, the Q-Factor includes variables such as Net Profit Margin (NPM) stability, the company's Debt-to-Equity (D/E) ratio compared to the industry average, Cash Flow from Operations (CFO), and promoter & institutional shareholdings.

Similarly, the G-Factor assigns a score out of 100 to evaluate financial performance and growth trends. The underlying variables are Sales Growth, EBITDA Growth, Gross Block Growth and Return on Equity (ROE). On the other hand, the V-Factor also scored out of 100 measures how the market values the firm relative to its industry peers. This factor incorporates metrics such as the Price-to-Earnings (P/E) ratio, Price-to-Book (P/B) ratio and Dividend Yield.

Model used in the study

i. Q Factor = $a \times \text{Net Profit Margin Stability} + b \times \text{Debt-to-Equity Ratio (D/E) vs Industry Average} + c \times \text{Cash Flow from Operations (CFO)} + d \times \text{Promoter Institutional Holdings}$.

ii. G Factor = $a \times \text{Sales Growth} + b \times \text{EBITDA Growth (EPS)} + c \times \text{Gross Block Growth (GP)} + d \times \text{Gross Block Growth (GP)}$.

iii. V Factor = $a \times \text{Price-to-Earnings (P/E) Ratio} + b \times \text{Price-to-Book (P/B) Ratio} + c \times \text{Dividend Yields}$.

where a, b, c, d are weights you choose

Finally, M score is calculated

$$M_score = wG \times \text{Normalised G} + wQ \times \text{Normalised Q} + wV \times \text{Normalised V}$$

List of companies selected in the study are

	Company
1	Tata Steel Limited
2	Steel Authority of India Limited
3	JSW Steel Limited
4	ArcelorMittal Nippon Steel India
5	Jindal Steel and Power Limited

Source: Author compilations

ANALYSIS AND INTERPRETATION

The Q-Factor is a composite measure of financial performance, built from four key parameters: Net Profit Margin (NPM) (30 %), Debt-to-Equity vs Interest-to-Assets (D/E vs I/A) (30 %), Cash Flow from Operations (CFO) (30 %), and Promoter & Institutional Holdings (PIH) (10 %). The final weighted score ‘Weight Sum Q’ captures both annual and cumulative performance trends.

TABLE 1- Q FACTOR

Q-Factor									
Tata Steel Limited									
Year	NPM		(D/E) vs I/A		(CFO)		PIH		Weight Sum Q
2016	17,549.25	0.30	0.3	0.30	5,970.01	0.30	1,248.60	0.10	7,180.73
2017	15,099.29	0.30	0.31	0.30	2,849.95	0.30	1,248.60	0.10	5,509.73
2018	33,037.40	0.30	0.34	0.30	2,855.29	0.30	1,222.40	0.10	10,890.15
2019	16,244.76	0.30	0.46	0.30	2,396.90	0.30	1,222.37	0.10	5,714.87
2020	7,958.39	0.30	0.48	0.30	1,226.87	0.30	1,198.78	0.10	2,875.60
2021	10,238.76	0.30	0.42	0.30	718.11	0.30	1,146.13	0.10	3,401.80
2022	6,126.15	0.30	0.51	0.30	4,696.74	0.30	1,146.12	0.10	3,361.63
2023	3,900.65	0.30	0.66	0.30	970.31	0.30	1,146.12	0.10	1,576.10
2024	1,281.14	0.30	0.51	0.30	1,036.13	0.30	971.41	0.10	792.48
Weight Sum Q									41,303.08
Steel Authority of India Limited (SAIL)									
2016	3,259.95	0.30	0.63	0.30	5,970.01	0.30	1,687.24	0.10	2,937.90
2017	1,681.15	0.30	0.46	0.30	2,849.95	0.30	2,638.89	0.10	1,623.36
2018	12,295.99	0.30	0.58	0.30	2,855.29	0.30	6,988.42	0.10	5,244.40
2019	3,835.94	0.30	1.1	0.30	2,396.90	0.30	6,109.57	0.10	2,481.14
2020	2,544.74	0.30	1.27	0.30	1,226.87	0.30	3,619.68	0.10	1,493.83
2021	2,463.18	0.30	1.23	0.30	718.11	0.30	2,872.64	0.10	1,242.02
2022	-435.34	0.30	1.21	0.30	4,696.74	0.30	2,243.70	0.10	1,503.15
2023	-2,568.33	0.30	1.02	0.30	970.31	0.30	1,729.73	0.10	-306.13
2024	-3,960.70	0.30	0.78	0.30	1,036.13	0.30	557.13	0.10	-821.42
Weight Sum Q									15,398.25
JSW Steel Limited									
2016	8,130.96	0.30	21.63	0.30	23,645.00	0.30	730	0.10	9,612.28
2017	4,980.22	0.30	21.68	0.30	16,943.00	0.30	340	0.10	6,617.47
2018	17,231.81	0.30	25.07	0.30	33,075.00	0.30	1,735.00	0.10	15,273.06
2019	8,679.28	0.30	21.77	0.30	19,542.00	0.30	650	0.10	8,537.92
2020	6,379.77	0.30	12.94	0.30	11,836.00	0.30	200	0.10	5,488.61
2021	8,117.53	0.30	13.47	0.30	18,917.00	0.30	410	0.10	8,155.40
2022	4,868.18	0.30	15.68	0.30	13,720.00	0.30	320	0.10	5,613.16
2023	3,664.91	0.30	17.62	0.30	11,799.00	0.30	225	0.10	4,666.96
2024	2,320.95	0.30	18.01	0.30	826.7	0.30	75	0.10	957.20
Weight Sum Q									64,922.05
ArcelorMittal Nippon Steel India									
2016	7,123.84	0.30	0.97	0.30	14,925.00	0.30	2.79	0.10	6,615.22

2017	2,593.48	0.30	0.84	0.30	7,851.58	0.30	0.87	0.10	3,133.86
2018	8,583.97	0.30	1.61	0.30	13,645.80	0.30	2.89	0.10	6,669.70
2019	1,312.15	0.30	15.21	0.30	7,771.23	0.30	2.03	0.10	2,729.78
2020	-1,112.37	0.30	0	0.30	18,732.60	0.30	15.1	0.10	5,287.58
2021	-7,337.16	0.30	0	0.30	2,230.55	0.30	0	0.10	-1,531.98
2022	-16,843.6	0.30	0	0.30	-3,100.60	0.30	0	0.10	-5,983.28
2023	-3,302.89	0.30	0	0.30	728.9	0.30	0	0.10	-772.20
2024	-4,580.10	0.30	7.41	0.30	276.89	0.30	0	0.10	-1,288.74
Weight Sum Q									14,859.94
Jindal Steel and Power Limited (JSPL)									
2016	7,123.84	0.30	2,461.23	0.30	14,925.00	0.30	55	0.10	7,358.52
2017	2,593.48	0.30	-471.38	0.30	7,851.58	0.30	40	0.10	2,996.10
2018	8,583.97	0.30	1,234.52	0.30	13,645.80	0.30	27	0.10	7,041.99
2019	1,312.15	0.30	-279.78	0.30	7,771.23	0.30	26	0.10	2,643.68
2020	-1,112.37	0.30	823.45	0.30	18,732.60	0.30	44	0.10	5,537.50
2021	-7,337.16	0.30	-575.76	0.30	2,230.55	0.30	60	0.10	-1,698.71
2022	-16,843.6	0.30	4,490.74	0.30	-3,100.60	0.30	84	0.10	-4,627.66
2023	-3,302.89	0.30	-1,573.4	0.30	728.9	0.30	91	0.10	-1,235.13
2024	-4,580.10	0.30	-2,167.5	0.30	276.89	0.30	97	0.10	-1,931.54
Weight Sum Q									16,084.76

Source: Author compilations

For instance, JSW Steel Ltd. showed consistently strong operational performance: CFO peaked at ₹33,075 crore in 2018; high leverage ratios (D/E vs I/A) from 2016–19 suggest an aggressive but effective capital structure; and NPM also peaked in 2018 (₹17,231.81 crore), underscoring profitability strength. Overall, JSW emerged as the Q-Factor leader, supported by robust cash generation and capital-efficiency.

In contrast, Tata Steel Ltd. exhibited more volatile results: although its NPM peaked in 2018 (₹33,037.40 crore), it declined sharply toward 2024; its CFO weakened after 2018, signalling a reduction in operational strength; and while its PIH remained stable (₹1,146 crore) this had limited influence on the overall Q-Factor. Hence, despite a strong start, Tata Steel's Q-Factor weakened post-2020.

Jindal Steel & Power Ltd. showed high variability in leverage (D/E vs I/A) with large swings between positive and negative values. While its CFO peaked in 2020 (₹18,732.60 crore), its NPM turned negative in subsequent years. Although its PIH rose moderately, the deterioration in fundamentals produced mixed Q-Factor performance, particularly after 2020.

Steel Authority of India Ltd. faced substantial weakening: NPM became negative after 2022, signalling serious profitability pressure; its CFO remained modest and without significant improvement; and its PIH peaked in 2018 (₹6,988.42 crore) but declined afterward. The company recorded a consistently weak and falling Q-Factor, pointing to increased financial stress in recent years.

ArcelorMittal Nippon Steel India Ltd. (AMNS India) reported negative NPM from 2020, which heavily impacted its Q-Factor. Although CFO was strong in 2020 (₹18,732.60 crore), it lacked consistency over time;

minimal PIH further reflected weak investor confidence. Overall, AMNS ended up with the lowest cumulative Q-Factor, reflecting persistent financial instability.

In 2018 emerged as the peak year for most firms (especially JSW and Tata), driven by strong NPM and CFO. After 2020, the industry saw a broad downturn — negative profitability and erratic cash flows became common. Among all players, JSW Steel stood out for its sustained operational resilience and efficient leverage management. One of the key differentiators was the Debt-to-Interest-to-Assets ratio: high performers like JSW maintained a sustainable structure, whereas firms like SAIL and JSPL showed stress.

G FACTOR

The G-Factor aggregates governance-related metrics through a weighted scoring system: Sales Growth (30 %), EBITDA Growth (30 %), Gross Profit (GP) Growth (30 %), and Return on Equity (ROE) (10 %). For each company, these annual scores are summed to give a “Weighted Sum G,” and the total across all years yields the G-Factor score used in the M-Score ranking.

TABLE 2 G-Factor									
Tata Steel Limited									
Year	Sales Growth		EBITD		GP		ROE		Weight Sum Q
2016	24,972.00	0.30	11.19	0.30	24,972.00	0.30	11.19	0.10	14,987.68
2017	25,513.66	0.30	12.54	0.30	25,513.66	0.30	12.54	0.10	15,313.21
2018	26,046.02	0.30	12.01	0.30	26,046.02	0.30	12.01	0.10	15,632.42
2019	49,554.34	0.30	270.06	0.30	49,554.34	0.30	27.01	0.10	29,816.32
2020	24,079.10	0.30	142.46	0.30	24,079.10	0.30	14.25	0.10	14,491.62
2021	10,531.10	0.30	58.84	0.30	10,531.10	0.30	5.88	0.10	6,336.90
2022	20,030.21	0.30	91.9	0.30	20,030.21	0.30	9.19	0.10	12,046.62
2023	10,365.71	0.30	36.38	0.30	10,365.71	0.30	3.64	0.10	6,230.70
2024	8,898.48	0.30	35.46	0.30	8,898.48	0.30	3.38	0.10	5,350.06
Weight Sum Q									120,205.53
Steel Authority of India Limited (SAIL)									
2016	105,374.59	0.30	6.62	0.30	8,965.12	0.30	0.63	0.10	34,303.96
2017	104,447.36	0.30	4.61	0.30	7,599.43	0.30	0.46	0.10	33,615.47
2018	103,473.32	0.30	29.09	0.30	20,312.89	0.30	0.58	0.10	37,144.65
2019	69,110.02	0.30	9.32	0.30	10,981.03	0.30	1.1	0.10	24,030.22
2020	61,660.55	0.30	4.89	0.30	6,925.71	0.30	1.27	0.10	20,577.47
2021	66,967.31	0.30	5.69	0.30	6,722.61	0.30	1.23	0.10	22,108.81
2022	58,962.36	0.30	0	0.30	2,305.98	0.30	1.21	0.10	18,380.62
2023	49,767.10	0.30	0	0.30	-2,170.91	0.30	1.02	0.10	14,278.96
2024	43,875.17	0.30	0	0.30	-4,605.15	0.30	0.78	0.10	11,781.08
Weight Sum Q									216,221.2
JSW Steel Limited									
2016	135,180.00	0.30	26.36	0.30	17,537.00	0.30	18.26	0.10	45,824.83
2017	131,687.00	0.30	16.4	0.30	11,920.00	0.30	0.25	0.10	43,087.05
2018	118,820.00	0.30	55.49	0.30	29,226.00	0.30	35.17	0.10	44,433.96
2019	70,727.00	0.30	27.79	0.30	15,977.00	0.30	22.46	0.10	26,021.78

2020	64,262.00	0.30	17.58	0.30	7,814.00	0.30	9.94	0.10	21,629.07
2021	77,187.00	0.30	26.98	0.30	15,128.00	0.30	24.28	0.10	27,705.02
2022	67,723.00	0.30	15.31	0.30	10,129.00	0.30	23.63	0.10	23,362.56
2023	56,913.00	0.30	11.88	0.30	8,156.00	0.30	19.41	0.10	19,526.21
2024	40,858.96	0.30	0	0.30	-2,392.03	0.30	-14.91	0.10	11,538.59
Weight Sum Q									263,129.07
ArcelorMittal Nippon Steel India									
2016	53,399.10	0.30	2.79	0.30	11,838.25	0.30	-14.91	0.10	19,570.55
2017	55,668.12	0.30	0.87	0.30	4,178.27	0.30	-14.91	0.10	17,952.69
2018	32,027.36	0.30	2.89	0.30	10,928.21	0.30	-14.91	0.10	12,886.05
2019	28,107.45	0.30	2.03	0.30	4,012.76	0.30	-14.91	0.10	9,635.18
2020	31,820.23	0.30	15.1	0.30	17,186.87	0.30	-14.91	0.10	14,705.17
2021	25,164.17	0.30	0	0.30	-6,007.27	0.30	-14.91	0.10	5,745.58
2022	19,906.61	0.30	0	0.30	-10,473.2	0.30	-14.91	0.10	2,828.52
2023	13,654.41	0.30	0	0.30	-4,878.89	0.30	-14.91	0.10	2,631.17
2024	13,933.58	0.30	0	0.30	-4,574.69	0.30	-14.91	0.10	2,806.18
Weight Sum Q									88,761.07
Jindal Steel and Power Limited (JSPL)									
2016	57,434.32	0.30	2.79	0.30	11,838.25	0.30	9,458.46	0.10	21,728.45
2017	53,399.10	0.30	0.87	0.30	4,178.27	0.30	1,715.57	0.10	17,445.03
2018	55,668.12	0.30	2.89	0.30	10,928.21	0.30	8,459.31	0.10	20,825.70
2019	32,027.36	0.30	2.03	0.30	4,012.76	0.30	1,588.92	0.10	10,971.54
2020	28,107.45	0.30	15.1	0.30	17,186.87	0.30	14,744.42	0.10	15,067.27
2021	31,820.23	0.30	0	0.30	-6,007.27	0.30	-7,906.88	0.10	6,953.20
2022	25,164.17	0.30	0	0.30	-10,473.2	0.30	-12,352.3	0.10	3,171.98
2023	19,906.61	0.30	0	0.30	-4,878.89	0.30	-6,781.95	0.10	3,830.12
2024	13,654.41	0.30	0	0.30	-4,574.69	0.30	-6,524.55	0.10	2,071.46
Weight Sum Q									102,064.00

Source: Author compilations

JSW Steel Ltd. leads the pack with a total G-Factor score of 263,129.07. Its strengths lie in consistently high sales growth and EBITDA performance from 2016 to 2022, along with strong GP and ROE in the earlier years (especially 2018). Its notable weakness is the sharp decline in 2024, when ROE and GP turned negative. Overall, JSW Steel leads in governance-metrics owing to sustained profitability and growth despite recent setbacks.

Steel Authority of India Ltd. (SAIL) comes next with a total G-Factor score of 216,221.20. Its strengths include strong sales growth across all years and high GP in 2018 and 2019. The weakness is a steep fall in EBITDA and ROE from 2022 onward. SAIL's governance strength is rooted in scale and operational output, but recent profitability issues have undermined its edge.

Tata Steel Ltd. tallies a total G-Factor score of 120,205.53. Its strengths are solid EBITDA and GP in 2019–2020 and a stable ROE in its earlier years. The weakness is declining performance after 2021, with ROE in particular contracting. Tata Steel shows balanced governance performance, hitting its peak around 2019-20, but in recent years has seen a downturn.

Jindal Steel & Power Ltd. (JSPL) scores 102,064.00 in total. Its strengths stem from strong GP and ROE in 2016–2020. However, its weaknesses are persistent GP and ROE turned negative from 2021 onward. Although JSPL had a strong start, its governance metrics eroded significantly in the later years, dragging down its overall score.

ArcelorMittal Nippon Steel India Ltd. (AMNS) records the lowest total G-Factor score at 88,761.07. Its strengths are modest moderate sales growth in the early years. But its weaknesses dominate: persistent negative ROE from 2016–2024, flat or declining EBITDA and GP, and weak shareholder returns. AMNS struggles with governance and profitability, hence its lowest governance score.

In 2019 was the high-water mark for most companies especially Tata Steel and JSW Steel likely due to favorable market conditions. After 2020, the sector suffered a broad downturn, probably due to the pandemic, higher costs, and weaker demand. A standout differentiator is ROE: companies with consistently positive ROE (JSW, Tata) outperform those with persistently negative ROE (AMNS, JSPL).

V FACTOR

The V-Factor represents a composite valuation metric built from three key market indicators: the Price-to-Earnings (P/E) ratio (weighted 40 %), the Price-to-Book (P/B) ratio (weighted 30 %) and the Dividend Yield (weighted 30 %). Each year, a company’s values for these metrics are combined (as the “Weighted Sum V”) and aggregated over time to produce its total V-Factor score.

TABLE 3 V-Factor							
Tata Steel Limited							
Year	(P/E) Ratio		(P/B) Ratio		Dividend Yields		Weight Sum Q
2016	0.34	0.40	127.98	0.30	3.6	0.30	39.61
2017	0.3	0.40	120.57	0.30	3.6	0.30	37.371
2018	0.31	0.40	111.2	0.30	51	0.30	48.784
2019	0.34	0.40	1,019.17	0.30	25	0.30	313.387
2020	0.46	0.40	785.21	0.30	10	0.30	238.747
2021	0.48	0.40	652.21	0.30	13	0.30	199.755
2022	0.42	0.40	614.24	0.30	10	0.30	187.44
2023	0.51	0.40	535.82	0.30	10	0.30	163.95
2024	0.66	0.40	472.56	0.30	8	0.30	144.432
Weight Sum Q							1373.476
Steel Authority of India Limited (SAIL)							
2016	0.81	0.40	131.05	0.30	2	0.30	40.239
2017	0.82	0.40	126.23	0.30	1.5	0.30	38.647
2018	0.86	0.40	125.93	0.30	8.75	0.30	40.748
2019	0.61	0.40	105.3	0.30	2.8	0.30	32.674
2020	0.58	0.40	96.3	0.30	0	0.30	29.122
2021	0.68	0.40	92.36	0.30	0.5	0.30	28.13
2022	0.65	0.40	86.46	0.30	0	0.30	26.198

2023	0.61	0.40	87.18	0.30	0	0.30	26.398
2024	0.61	0.40	94.89	0.30	0	0.30	28.711
Weight Sum Q							290.867
JSW Steel Limited							
2016	17.49	0.40	246.83	0.30	7.3	0.30	83.235
2017	12.87	0.40	211.49	0.30	3.4	0.30	69.615
2018	27.84	0.40	210.97	0.30	17.35	0.30	79.632
2019	27.63	0.40	155.55	0.30	6.5	0.30	59.667
2020	20.49	0.40	127.45	0.30	2	0.30	47.031
2021	24.51	0.40	115.92	0.30	4.1	0.30	45.81
2022	20.26	0.40	92.41	0.30	3.2	0.30	36.787
2023	20.73	0.40	80.06	0.30	2.25	0.30	32.985
2024	16.36	0.40	678.31	0.30	7.5	0.30	212.287
Weight Sum Q							667.049
ArcelorMittal Nippon Steel India							
2016	-24.89	0.40	16.93	0.30	0	0.30	-4.877
2017	-13.26	0.40	15.85	0.30	0	0.30	-0.549
2018	-8.08	0.40	16.53	0.30	0	0.30	1.727
2019	-3.54	0.40	7.17	0.30	0	0.30	0.735
2020	0	0.40	-0.58	0.30	0	0.30	-0.174
2021	0	0.40	-76.41	0.30	0	0.30	-22.923
2022	-16.25	0.40	-52.83	0.30	0	0.30	-22.349
2023	133.14	0.40	-12.52	0.30	0	0.30	49.5
2024	109.74	0.40	3.47	0.30	0	0.30	44.937
Weight Sum Q							46.027
Jindal Steel and Power Limited (JSPL)							
2016	54.58	0.40	16.93	0.30	0	0.30	26.911
2017	215.87	0.40	15.85	0.30	0	0.30	91.103
2018	1,798.30	0.40	16.53	0.30	0	0.30	724.279
2019	229.51	0.40	7.17	0.30	0	0.30	93.955
2020	676.41	0.40	-0.58	0.30	0	0.30	270.39
2021	362.38	0.40	-76.41	0.30	0	0.30	122.029
2022	223.69	0.40	-52.83	0.30	0	0.30	73.627
2023	362.8	0.40	-12.52	0.30	0	0.30	141.364
2024	-142.63	0.40	3.47	0.30	0	0.30	-56.011
Weight Sum Q							1487.647

Source: Author compilations

Tata Steel Ltd. enjoyed a strong valuation profile, especially thanks to its high dividend payouts. However, the downward trend after 2019 suggests the market was adjusting its expectations or the investor perception turned more cautious. Steel Authority of India Ltd. (SAIL) appears to have had limited investor valuation appeal — possibly owing to weaker profitability or changes in its dividend policy. The low P/B and modest investor interest hint at this. (For example, SAIL's P/B ratio has hovered under 1× in recent years.). W Steel Ltd. shows more volatile valuation metrics investor sentiment seems to have fluctuated. A spike in 2024 might reflect a one-time extraordinary event (such as a payout or restructuring) or a temporary anomaly.

Jindal Steel & Power Ltd. (JSPL) recorded exceptional valuation spikes during the period; these likely stemmed from investor optimism or speculative growth prospects. However, its negative P/E in later years suggests losses, which adds risk to the valuation story. ArcelorMittal Nippon Steel India Ltd. (AMNS) appears to have the weakest valuation appeal — low dividend yield, weak profitability and flat or declining valuation multiples all suggest limited investor enthusiasm.

In short, Tata Steel and JSPL appear to dominate in terms of valuation attractiveness — Tata thanks to its consistent dividend yield and JSPL via occasional valuation surges (though with higher volatility). JSW Steel holds a middle ground — potential upside exists, but valuation swings are notable. SAIL and AMNS stand on the weaker side of the spectrum, likely penalized by lower dividends and subdued investor sentiment.

A key differentiator across these firms is dividend yield: companies with steady and meaningful payout policies (Tata Steel) tend to outperform in the valuation dimension compared to those with none or inconsistent dividends (JSPL, AMNS).

TABLE 4- RANKING BASED ON M- SCORE

	Company	Q-Factor	N Q	G-Factor	N G	V-Factor	N V	M Score	Rank	ObservationS
1	Tata Steel Limited	41,303	0.40	120,205	0.30	1373	0.3	52994.93	3	Strong Q and G factors, but very high V- (1373) likely reduced its rank.
2	Steel Authority of India Limited	15,398	0.40	216,221	0.30	290	0.3	71112.93	2	Highest G Factor and zero V- (risk), giving it a strong edge.
3	JSW Steel Limited	64,922	0.40	263,129	0.30	667	0.3	105107.7	1	Highest Q Factor, but low G and moderate V+ led to lowest M Score.
4	ArcelorMittal Nippon Steel India	14,859	0.40	88,761	0.30	46.00	0.3	32586.11	5	Low Q and G factors, but zero V- helped maintain a decent score
5	Jindal Steel and Power Limited	16074	0.40	102,064	0.30	1487	0.3	37495.4	4	Moderate Q and G factors, but high V- may have dampened score.

Source: Author compilations

Steel Authority of India Limited (SAIL) stands out with an exceptionally high G-Factor (216.233) and essentially zero in the “V-” dimension, suggesting it has strong governance and minimal perceived risk.

Tata Steel Limited posts a high Q-Factor (41.303) and a respectable G-Factor (120.205), but its very high “V-” score (1,373) appears to have hurt its overall M-Score ranking.

JSW Steel Ltd., with the highest Q-Factor of the group (64.922), demonstrates strong quantitative performance, but its weaker governance metric (G-Factor) and lack of risk mitigation (high “V-” exposure) seem to explain its bottom-rank position.

Jindal Steel & Power Ltd. (JSPL) and ArcelorMittal Nippon Steel India Ltd. (AMNS India) have somewhat similar G-Factor levels, but JSPL’s much higher “V-” score (1,487) likely offset the benefit of its better Q-Factor.

CONCLUSION

The M-Score clearly rewards companies that combine strong governance (high G-Factor), low risk exposure (low V-), and balanced quantitative performance (Q-Factor). For instance, Steel Authority of India Limited (SAIL) emerges at the top because of its governance strength and very low risk profile. On the other hand, even though JSW Steel Ltd. boasts the strongest Q-Factor (indicating excellent operational metrics), its weaker governance and higher risk exposure drag it down in the overall ranking.

The QGV Composite Framework uncovers nuanced performance paths among India's major steel firms. JSW Steel consistently led in operational efficiency and growth-oriented governance metrics, earning top Q- and G-Factor scores. Tata Steel Ltd. delivered strong valuation appeal and witnessed profitability peaks around 2018-2019, but then faced contraction post-pandemic. SAIL, while large in scale and sales growth, struggled with declining profitability and weaker returns for investors. Both Jindal Steel & Power Ltd. (JSPL) and ArcelorMittal Nippon Steel India Ltd. (AMNS India) showed high volatility: persistent negative ROE, erratic cash flows and general instability undermined their strategic positioning.

The study highlights how composite scoring rather than single-metric evaluation is crucial for capturing the full picture in capital-intensive sectors like steel. It also underscores 2018-2019 as the peak years for many firms, followed by clear sector-wide stress after 2020. Ultimately, the QGV model offers a robust tool for stakeholders to assess financial health, strategic direction, and investment potential in the steel sector.

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