



Cost and Profitability Analysis of Steel Manufacturing Companies: Evidence from JSW Steel Limited

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Abstract

The present study examines the relationship between major cost components and the profitability of JSW Steel Limited during the period 2017–2026. The study is based on secondary data collected from the company's published annual reports and the Prowess database. Major cost components considered include Raw Materials, Compensation to Employees, Power, Fuel and Water Charges, Repairs and Maintenance, Selling and Distribution Expenses, and Depreciation, while Profit After Tax (PAT) is used as the measure of profitability. Descriptive statistics, trend analysis, profitability analysis, and multiple regression analysis were employed to evaluate the behavior of cost components and their influence on profitability. The findings reveal that although operating costs increased steadily over the study period, the company maintained strong long-term profitability, with PAT increasing from ₹34,540 million in 2017 to ₹259,830 million in 2026. The regression results indicate that none of the selected cost components had a statistically significant individual impact on profitability ($p > 0.05$), suggesting that JSW Steel Limited effectively managed its operating costs while sustaining financial performance. The study concludes that efficient cost management, supported by sound operational strategies, plays a vital role in maintaining long-term profitability and provides useful insights for managers, investors, and researchers in the steel industry.

Keywords: Cost Analysis, Profitability Analysis, Cost Management, Steel Manufacturing Industry, Profit After Tax, JSW Steel Limited,

Introduction

The steel industry is a key driver of industrial and economic development, supplying essential raw materials for infrastructure, construction, automobiles, engineering, and other manufacturing sectors. In India, the industry has witnessed significant growth due to rapid urbanization, increased infrastructure investment, and government initiatives such as the National Steel Policy and Make in India. However, steel manufacturers operate in a highly competitive environment characterized by volatile raw material prices, rising energy costs, technological advancements, and changing market conditions. Consequently, effective cost management has become essential for improving operational efficiency and sustaining profitability.

Cost management involves planning and controlling organizational expenditures to optimize resource utilization and enhance financial performance. In steel manufacturing, major cost components such as raw materials, employee compensation, power, fuel and water charges, repairs and maintenance, selling and distribution expenses, and depreciation account for a substantial share of total operating costs. Efficient management of these costs enables firms to improve productivity, maintain competitive advantage, and achieve long-term financial sustainability. Since profitability reflects a company's ability to generate earnings while effectively controlling costs, analysing the relationship between cost components and profitability is vital for evaluating financial performance. JSW Steel Limited, one of India's leading integrated steel

manufacturers, has achieved sustained growth through capacity expansion, technological innovation, and operational excellence. Nevertheless, the company continues to face challenges arising from fluctuations in input costs and market conditions, making it an appropriate case for examining cost management and profitability. Accordingly, the present study analyzes the cost structure and profitability of JSW Steel Limited using secondary data for the period 2017–2026. By applying descriptive statistics, trend analysis, cost ratio analysis, correlation analysis, and regression analysis, the study evaluates the behavior of major cost components and their influence on Profit After Tax (PAT). The findings are expected to provide valuable insights for managers, investors, researchers, and policymakers in enhancing cost efficiency and long-term financial performance.

Literature Review

Zaky et.al (2025) examined the application of Lean Six Sigma to reduce production costs in iron and steel manufacturing. Using a case study approach with data from three steel companies, the study found that Lean Six Sigma significantly improved throughput, inventory turnover, and plant availability while reducing production delays and waste. The authors concluded that effective implementation of Lean Six Sigma enhances cost efficiency and strengthens the competitiveness of steel manufacturers.

Meng et.al (2007) proposed an integrated production cost management system based on Activity-Based Costing (ABC) and ERP/MES technologies for iron and steel enterprises. The study demonstrated that integrating production and financial information improved the accuracy of cost allocation, reduced product costs, and enhanced overall cost control. The authors concluded that integrated cost management systems improve operational efficiency and market competitiveness.

Trejo-Pech et.al. (2018) analyzed the production and supply chain costs of pennycress-based biofuel using an economic cost model. The findings indicated that profitability depends largely on production costs, crop yields, and market prices. The study concluded that efficient cost management and supply chain optimization are essential for improving profitability and ensuring sustainable business operations.

Karaman, Taşcıoğlu, and Bulut (2022) investigated the relationship between production costs and profitability in 63 broiler farms in Turkey. The study found that feed conversion efficiency and heating costs had a significant influence on farm income and profitability. The authors concluded that effective control of production costs is essential for improving enterprise profitability.

Richard Evarist (2026) analyzed the financial performance of Tata Steel using ratio analysis and advanced analytical techniques such as regression, machine learning, and DuPont analysis. The study found that the company maintained strong profitability despite facing liquidity and cost management challenges. It concluded that efficient cost management, balanced financing, and sustainable business practices are vital for long-term financial performance in the steel industry.

Li (2016) evaluated the profitability of Wuhan Iron and Steel Co., Ltd. using financial data from 2011 to 2015. The analysis revealed a continuous decline in profitability

compared with the industry average. The study concluded that the company should adopt effective financial and operational strategies to improve profitability and strengthen its competitive position in the steel industry.

Objectives of the study

1. To analyse the trends in the major cost components of JSW Steel Limited during the study period from 2017–2026.
2. To examine the profitability performance of JSW Steel Limited during the study period.
3. To assess the impact of major cost components on the Profit After Tax (PAT) of JSW Steel Limited.

Research Methodology

Sources of Data: The study is based on secondary data collected from the published annual reports of JSW Steel Limited. The required financial information relating to sales, major cost components, and Profit After Tax (PAT) was obtained from the company's audited financial statements.

Period of the Study: The study covers a period of ten financial years, from FY 2017–18 to FY 2026–27 (reported as 2017–2026 based on the financial data used for analysis).

Parameters Selected for the Study: The study examines the major cost components that influence the profitability of JSW Steel Limited. The selected independent variables include Raw Materials, Stores and Spares, Compensation to Employees, Power, Fuel and Water Charges, Repairs and Maintenance, Selling and Distribution Expenses, and Depreciation. Profit After Tax (PAT) was considered as the dependent variable to evaluate the impact of the selected cost components on the company's profitability.

Tool Used for Analysis: The study employs Descriptive Statistics, Trend Analysis, and Multiple Regression Analysis to analyse the collected data. Descriptive statistics were used to summarize the characteristics of the selected variables through measures such as the minimum, maximum, mean, and standard deviation.

Trend Analysis

Trend analysis was used to examine the changes in the selected variables over the study period.

$$\text{Trend Percentage} = \left(\frac{\text{Current Year Value}}{\text{Base Year Value}} \right) \times 100$$

Where:

- Current Year Value = Value of the variable in the respective year
- Base Year Value = Value of the variable in the base year (2017–18)

A trend percentage greater than 100 indicates an increase over the base year, while a value below 100 indicates a decline.

Multiple Regression Analysis

The relationship between the selected cost components and profitability was estimated using the following multiple linear regression model:

$$PAT = \beta_0 + \beta_1 RM + \beta_2 EC + \beta_3 PFW + \beta_4 RMN + \beta_5 SD + \beta_6 DEP + \varepsilon$$

Where:

Dependent Variable: PAT = Profit After Tax

Independent Variables: RM = Raw Materials, Stores and Spares, EC = Compensation to Employees, PFW = Power, Fuel and Water Charges, RMN = Repairs and Maintenance, SD = Selling and Distribution Expenses, DEP = Depreciation

β_0 = Intercept (Constant)

β_1 – β_6 = Regression coefficients of the independent variables

ε = Error term (random disturbance).

Analysis and Results

To analyse the cost structure and profitability of JSW Steel Limited, the year-wise values of Sales, Raw Materials, Stores and Spares, Compensation to Employees, Power, Fuel and Water Charges, Repairs and Maintenance, Selling and Distribution Expenses, Depreciation, and Profit After Tax (PAT) were examined. The results are presented and interpreted in the following table.

Table 1: Major Cost Components and Profit After Tax of JSW Steel Limited (₹ Million) during 2017-2026

Year	Raw Materials, Stores & Spares	Compensation to Employees	Power, Fuel & Water Charges	Repairs & Maintenance	Selling & Distribution Expenses	Depreciation	Profit After Tax (PAT)
Mar-17	3,24,730	17,000	48,830	12,480	23,340	34,300	34,540
Mar-18	4,18,120	18,430	56,970	10,310	39,500	33,750	60,710
Mar-19	4,75,850	24,890	70,530	12,050	40,660	40,280	75,540
Mar-20	4,26,460	28,390	62,720	12,540	39,440	42,330	40,090
Mar-21	3,56,800	25,060	59,850	12,110	41,660	46,620	78,720
Mar-22	6,73,690	34,930	1,12,890	16,670	73,400	59,870	2,00,210
Mar-23	10,14,980	39,150	1,74,520	20,960	80,280	74,600	42,760
Mar-24	10,09,320	45,910	1,51,270	24,170	89,620	81,570	91,450
Mar-25	9,59,430	47,980	1,61,610	25,760	1,40,430	92,950	38,020
Mar-26	9,72,080	52,850	1,61,520	29,880	1,33,510	96,010	2,59,830

Source: Prowess database

Table 2: Descriptive Statistics of Cost Components and Profit of JSW Steel Limited

Variable	Mean	Std. dev.	Min	Max
Raw Materials, Stores & Spares	663146	295610.5	324730	1014980
Compensation to Employees	33459	12661.77	17000	52850
Power, Fuel & Water Charges	106071	51532.28	48830	174520
Repairs & Maintenance	17693	6980.303	10310	29880
Selling & Distribution Expenses	70184	41097.53	23340	140430
Depreciation	60228	24244.19	33750	96010
Profit After Tax (PAT)	92187	76476.09	34540	259830

Source: Author's compilation and calculations based on financial data sourced from the Prowess database

Table 1 presents the year-wise major cost components and Profit After Tax (PAT) of JSW Steel Limited during the period 2017–2026. The results show that the company's major operating costs increased considerably over the study period. Raw Materials, Stores and Spares remained the largest cost component, increasing from ₹324,730 million in 2017 to ₹972,080 million in 2026. Similarly, Compensation to Employees, Power, Fuel and Water Charges, Repairs and Maintenance, Selling and Distribution Expenses, and Depreciation exhibited an overall increasing trend, reflecting the company's expansion in production capacity and business operations. Profit After Tax (PAT) also demonstrated an overall upward trend despite year-to-year fluctuations, rising from ₹34,540 million in 2017 to ₹259,830 million in 2026, with exceptionally high profits recorded in 2022 and 2026.

Table 2 presents the descriptive statistics of the selected cost components and Profit After Tax (PAT) of JSW Steel Limited. The findings reveal that Raw Materials, Stores and Spares recorded the highest average expenditure (Mean = ₹663,146 million), followed by Power, Fuel and Water Charges (Mean = ₹106,071 million) and Selling and Distribution Expenses (Mean = ₹70,184 million). Profit After Tax averaged ₹92,187 million during the study period. The standard deviation values indicate considerable variability in Raw Materials, Stores and Spares, Power, Fuel and Water Charges, and Profit After Tax, whereas Repairs and Maintenance exhibited comparatively lower variation. The descriptive statistics indicate substantial growth in the company's operating costs and profitability, with noticeable fluctuations throughout the study period.

Table 3: Trend Percentage Analysis of Cost Components and Profit of JSW Steel Limited (Base Year: 2017 = 100)

Variables	2017 (Base = 100)	2018	2019	2020	2021	2022	2023	2024	2025	2026
Raw Materials, Stores & Spares	100	129	147	131	110	207	313	311	295	299
Compensation to Employees	100	108	146	167	147	205	230	270	282	311
Power, Fuel & Water Charges	100	117	144	128	123	231	357	310	331	331
Repairs & Maintenance	100	83	97	100	97	134	168	194	206	239
Selling & Distribution Expenses	100	169	174	169	178	314	344	384	602	572
Depreciation	100	98	117	123	136	175	217	238	271	280
Profit After Tax (PAT)	100	176	219	116	228	580	124	265	110	752

Note: 2017 represents FY 2016-17, 2018 represents FY 2017-18, and so forth.

Source: Author's compilation and calculations based on financial data sourced from the Prowess database

Table 3 presents the trend percentage analysis of the major cost components and Profit After Tax (PAT) of JSW Steel Limited, taking 2017 as the base year (2017 = 100). The results indicate a substantial increase in all major cost components over the study period. Raw Materials, Stores and Spares recorded a consistent upward trend, reaching 299 in 2026, reflecting increased production activity and higher raw material consumption. Compensation to Employees also showed steady growth from 100 to 311, indicating continuous investment in human resources. Similarly, Power, Fuel and Water Charges increased sharply to 331 in 2026, highlighting the rising energy requirements associated with expanded manufacturing operations. Repairs and Maintenance expenses exhibited moderate but consistent growth, increasing from 100 to 239, while Depreciation rose to 280, reflecting sustained capital investment in plant and machinery.

Selling and Distribution Expenses registered the highest increase among all cost components, rising from the base value of 100 in 2017 to 602 in 2025 before marginally declining to 572 in 2026. This significant increase suggests the company's growing focus on strengthening its marketing and distribution network to support business expansion. Profit After Tax (PAT) displayed considerable fluctuations throughout the study period. Although the trend declined in certain years, particularly in 2020, 2023, and 2025, it increased substantially to 752 in 2026, indicating a remarkable improvement in the company's profitability compared with the base year. Overall, the trend analysis reveals that JSW Steel Limited experienced significant growth in both its operating costs and profitability, reflecting the company's expansion while maintaining strong long-term financial performance despite short-term fluctuations.

Table 4: Profitability analysis of JSW Steel Ltd. from 2017-2026

Year	Profit After Tax (₹ Million)	Yearly Growth Rate (%)
2017	34,540	–
2018	60,710	75.77
2019	75,540	24.43
2020	40,090	-46.93
2021	78,720	96.36
2022	2,00,210	154.33
2023	42,760	-78.64
2024	91,450	113.87
2025	38,020	-58.42
2026	2,59,830	583.4

Source: Author's compilation and calculations based on financial data sourced from the Prowess database

Table 4 presents the year-wise Profit After Tax (PAT) and annual growth rate of JSW Steel Limited during the period 2017–2026. The results indicate that the company's profitability experienced considerable fluctuations throughout the study period. Profit After Tax increased from ₹34,540 million in 2017 to ₹60,710 million in 2018, recording a strong growth rate of 75.77%, followed by a further increase to ₹75,540 million in 2019 (24.43%). However, profitability declined sharply in 2020 by 46.93%, reflecting the adverse impact of challenging business conditions during that year.

The company recovered strongly in the subsequent years, with Profit After Tax increasing by 96.36% in 2021 and 154.33% in 2022, reaching ₹200,210 million. A significant decline of 78.64% was observed in 2023, after which

profitability improved again in 2024 with a growth rate of 113.87%. Although PAT declined by 58.42% in 2025, the company recorded an exceptional recovery in 2026, achieving its highest Profit After Tax of ₹259,830 million with an impressive annual growth rate of 583.40%. The analysis shows that while JSW Steel Limited's profitability was highly volatile from year to year, the long-term trend remained positive. The substantial increase in Profit After Tax over the study period demonstrates the company's resilience and its ability to recover from temporary downturns. The fluctuations may be attributed to changes in market demand, steel prices, production costs, and macroeconomic conditions, while the strong recovery in 2026 reflects improved operational performance and effective financial management.

Table 5: Results of Multiple Regression Analysis of Cost Components and Profit After Tax (PAT) of JSW Steel Limited

H ₀ : There is no significant impact on Profit of JSW Steel Limited				
Dependent Variable	Independent Variable	Regression Coefficient	T-Statistic	Probability Value
Profit After Tax (PAT)	Raw Materials, Stores & Spares	-0.7086714	-0.79726	0.483571
	Compensation to Employees	16.1462305	1.117252	0.345301
	Power, Fuel & Water Charges	3.66085048	0.662049	0.555254
	Repairs & Maintenance	23.2407852	0.896776	0.435922
	Selling & Distribution Expenses	0.88174547	0.273569	0.802169
	Depreciation	-14.196516	-0.94094	0.41615
	Intercept	15536.9166	0.114516	0.916063
R-Square-	0.529267424			
H ₀	Accepted			

Source: Author's compilation and calculations based on financial data sourced from the Prowess database

Table 4 presents the results of the multiple regression analysis examining the impact of major cost components on the Profit After Tax (PAT) of JSW Steel Limited. The regression coefficients indicate that Compensation to Employees, Power, Fuel and Water Charges, Repairs and Maintenance, and Selling and Distribution Expenses have a positive relationship with Profit After Tax, whereas Raw Materials, Stores and Spares and Depreciation exhibit a negative relationship. However, the p-values for all independent variables are greater than the 0.05 significance level, indicating that none of the selected cost components has a statistically significant individual impact on the company's profitability during the study period. Therefore, the null hypothesis (H_0 : There is no significant impact on the Profit of JSW Steel Limited) cannot be rejected; it should be accepted.

The coefficient of determination (R^2) of 0.5293 indicates that approximately 52.93% of the variation in Profit After Tax is explained by the selected cost components. The absence of a statistically significant relationship may indicate that JSW Steel Limited has maintained effective cost management practices, enabling the company to control its major operating costs without adversely affecting profitability. It also suggests that the company's profitability is likely influenced by other factors such as sales growth, production efficiency, market demand, pricing strategies, and macroeconomic conditions, which are not included in the present regression model.

Conclusion

The cost structure and profitability of JSW Steel Limited during the period 2017–2026 were analysed using descriptive statistics, trend analysis, profitability analysis, and multiple regression analysis. The findings revealed that all major cost components, including Raw Materials, Compensation to Employees, Power, Fuel and Water Charges, Repairs and Maintenance, Selling and Distribution Expenses, and Depreciation, increased steadily over the study period, reflecting the company's expansion in production and operational activities. Despite the continuous rise in operating costs, Profit After Tax (PAT) increased substantially from ₹34,540 million in 2017 to ₹259,830 million in 2026, demonstrating the company's strong financial performance and long-term growth potential.

The trend and profitability analyses further indicated that although the company experienced fluctuations in annual profits due to changing market conditions and business cycles, the overall profitability trend remained positive. The trend percentage analysis showed that PAT increased from 100 in the base year to 752 in 2026, while the profitability analysis highlighted a remarkable annual growth rate of 583.40% in the final year of the study. These results reflect the company's financial resilience and its ability to recover from temporary setbacks through effective operational and strategic management.

The multiple regression analysis revealed that none of the selected cost components had a statistically significant individual impact on Profit After Tax ($p > 0.05$), while the model explained 52.93% of the variation in profitability ($R^2 = 0.5293$). This suggests that increases in major operating costs did not significantly influence the company's profitability during the study period. The findings may

indicate that JSW Steel Limited has implemented effective cost management practices, enabling it to control operating costs without adversely affecting financial performance. At the same time, the results suggest that profitability is also influenced by other factors, such as production efficiency, sales growth, pricing strategies, market demand, and macroeconomic conditions.

Overall, the study concludes that JSW Steel Limited has successfully balanced cost management with profitability, ensuring sustainable financial growth despite rising operating costs and periodic market fluctuations. The findings emphasize the importance of efficient cost control, operational excellence, and strategic decision-making in enhancing corporate profitability. The study contributes to the existing literature on cost management in the steel manufacturing industry and provides useful insights for managers, investors, policymakers, and researchers. Future research may extend this analysis by incorporating additional financial and operational variables and comparing multiple steel companies to obtain a broader understanding of the determinants of profitability in the Indian steel industry.

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