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Research Article

Financial Analytics and Financial modelling in Working Capital Management with respect to Indian Steel Industries

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Abstract: The research focuses on the aspects of financial soundness of the Steel Industries in India in terms of Working Capital Management. The data is derived from the annual report of SAIL for the period ranging from 2005-06 to 2009-10. The Altman's Z score model is used to analyse the financial ratios calculated from the financial statements of the company concerned. The Z-score for the company is found to be above 3.0, indicating a sound financial profile of the company, which implies that the it has been well managing its working capital. It is also observed that the operating profit of the company is functioning as a financial driver of the operation of the company. The research has brought out that the company has been successfully generating operating income out of the Capital invested. Approximately forty percent of the assets of the company is funded by the retained earnings. This is a good indicator of financial health as the company uses its own fund rather than borrowing from the market. Also, the forty percent debt-equity ratio points out that the company has a balanced profile of debt and equity capital and have enough cushion to fulfil the repayment obligation. The company has also succeeded to materialize sales out of its assets employed. Overall, the steel manufacturer has been performing well and is resilient to counter any financial shock out of its diversified capital structure.

Key Words: Working Capital, Steel Authority of India Limited (SAIL), Altman's Z-Score, Bankruptcy, Retained Earning, Total Asset, Operating Profit.

1. INTRODUCTION:

India is the second-largest producer of crude steel in the worlds with a production capacity of 133 million tonnes of Crude steel and 120 million tonnes of finished steel as of 2022. Indian steel sector has the privilege of the local availability of Iron ore and cheaper supply of labour. The steel output is the backbone of construction, manufacturing and capital good industries of India. National Steel Policy aims to enhance the steel output to 300 million tonnes by 2030-31. Major Steel producing States are Jharkhand, Odisha, West Bengal, Maharashtra, Karnataka and Gujarat. Apart from catering to the domestic need, India has emerged as a global steel hub exporting around 13 million tonnes in 2021-22. The inception of Steel Industry in India dates back to 1954 with the establishment of State-owned company Hindustan Steel Limited (HSL). Later Steel Authority of India Limited emerged as the leading public sector steel producer with its incorporation in 1973. SAIL is the second-largest steel producer of India and 20th largest in the world with an average capacity of 21 million tonne of saleable steal. It operates through 5 integrated plants and 3 special plants. Although it has almost 86% Govt. shareholding, given the 'MAHARATNA' status, it has an autonomous operation with a resilient financial position.





Figure 1: State-wise Steel Production (Source: Wikipedia)

2. REVIEW OF LITERATURE:

Johah Albert (2002) used Z-score model to analyse the financial condition and performance of micro business units of Kenya. The model brought out the distressed condition of the firms and recommended less leverage to sustain the business operation. Also, some revival techniques such as operational efficiency, capital diversification and market building were recommended with respect to the entities.

Mansur Mulla (2002) used Z-score model to examine the fitness of textile mills. He found that the mills were good at generating operating income out of total assets employed. However, higher liabilities undermined their potential for a sustainable operation and solvency in the long turn. He recommended to cut the current liabilities to have a larger extent of working capital.

Selvam M. and Others (2004) analysed the financial condition of India Cements Ltd. They found that the lossgenerating venture with a high debt pile up was on the verge of collapse and recommended a overhaul or shutdown to further minimise the losses.

V. Deendayal (2008) used Z-score model to analyse the financial soundness of SAIL. He found an increasing pattern of Z-score over the years to conclude a sound financial condition backed by a decent growth trajectory of the entity concerned.

Syna and Arshad Ali (1998) from their study found that the Khulna Newsprint Mills were poorly performing due to inefficient working capital management, outdated technology, huge loan outstanding, higher cost of raw materials and increased fixed costs.

Saleh Jahar and Parveen (1996) from their research found out that the Chittagong Steel Plants were on the verge of bankruptcy due to poor management, rigid state regulation, inefficient capital utilization and lagged operating cycle. **Hye & Rahman (1997)** used ration analysis and MDA analysis to conclude that the selected Insurance companies were doing well by putting aside their surplus in bank deposits and rolling out funds to generate consistent revenues.

3. OBJECTIVES OF THE STUDY:

- To analyse the Working Capital management of the Steel company considered for the study.
- To examine the financial soundness of the company with the help of financial analytics.
- To find out the setbacks or potentialities with respect to the sustained operation and growth of the company.



4. RESEARCH METHODOLOGY:

4.1. Data Frame:

The study is based on the secondary data compiled from the annual reports of Steel Authority of India Limited (SAIL). The period of the data ranges from 2005-06 to 2009-10. Apart from this, some research journals, committee reports and other reports have been used to construct the data frame for our study.

4.2. Research Framework:

The data is interpreted with the help of Altman's Z-score model. The model uses the Income statement and Balance sheet of a company to calculate five financial ratios. Then the Z-score is derived from the assigning weights to those ratios. This Z-score indicates the possibility of the company going bankrupt in the next 2 years.

The Altman's Z-score model is given as

Z = 1.2 X1 + 1.4 X2 + 3.3 X3 + 0.6 X4 + 1.0 X5

Where,

X1 = Working Capital / Total Assets

X2 = Retained Earnings / Total Assets

X3 = Earning Before Interest and Tax (EBIT) / Total Assets

X4 = Book Value of Equity / Book Value of Debt

X5 = Sales / Total Assets

The Z-Score is interpreted as

Less than 1.8 -> Bankruptcy zone

Within 1.8 and 3 -> Grey Zone (Safe)

Higher than 3 -> Sound financial Condition

5. DATA ANALYSIS:

5.1 Calculation of Z-Score:

Year	Net	Total	Retained	EBIT	Net Sales	Book Value	Book Value
	Working	Assets	Earnings			of Equity	of Debt
	capital						
2005-06	9276	30304	8255	8588	27837	12601	4297
2006-07	13879	33176	13054	12177	33923	17313	4180
2007-08	16879	40279	18874	14190	39508	23063	3045
2008-09	22398	53531	24018	12234	43150	27984	7538
2009-10	28037	67722	29234	13208	40551	33316	16511

Table 1: Extracts from the Financial Statements

The above table exhibits the parameters required for the calculation of Z-score, picked up from the financial statements of SAIL for the corresponding reference years of study.

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	Financial Ratios	2005-06	2006-07	2007-08	2008-09	2009-10
X ₁	NWC to Total Assets	0.305	0.418	0.419	0.418	0.414
X_2	R.E to Total Assets	0.272	0.393	0.468	0.448	0.431
X ₃	EBIT Total Assets	0.283	0.367	0.352	0.228	0.195
X_4	BVE to BVD	2.93	4.14	7.57	3.71	2.01
X_5	Net Sales to Total Assets	0.91	1.02	0.98	0.80	0.59

Table 2: Financial Ratios

Here the table calculates the financial rations for each year with the help of the data from the preceding table. Now we have all the components for the calculation of Z-score.

Year	1.2 X ₁	$1.4 \mathrm{X}_2$	3.3 X ₃	0.6 X ₄	$1.0 X_5$	Z-Score
2005-06	0.366	0.380	0.933	1.758	0.910	4.347
2006-07	0.501	0.550	1.211	2.46	1.02	5.741
2007-08	0.502	0.655	1.16	4.54	0.98	7.837
2008-09	0.501	0.627	0.752	2.22	0.80	4.900
2009-10	0.496	0.603	0.643	1.20	0.59	3.532

Table 3:	Computation	of Z-Score
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Finally, the Z-score of the company for each study year is arrived by assigning the weights to the computed ratios. For all the years, Z-score lies above 3.0, depicting a sound financial condition of the company. That means that the company has been managing its Working Capital in a sustainable manner. The highest Z-score is observed 7.83 in the year 2007-08.



5.2. Component Analysis:





Working Capital is the excess of Current Asset over the Current Liability. The NWC to Total Asset ratio indicates the activity of the firm. The graph depicts that the ratio since 2006-07 till 2009-10 averages around 0.41, which indicates that the operating profit year-on-year is utilised to fund the operation. A negative ratio would have meant an operating loss and consequent deterioration of Current Asset in the Total asset.





Graph 3: EBIT to Total Asset Ratio

The Company operates well to generate a good proportion of Capital invested as Operating Profit (EBIT) over the year. The ratio reached highest in 2006-07. However, the proportion has been declining since then till 2009-10, indicating a lower profit generation compared to the capital employed in the following years.





The figure above depicts the over the study period, almost 40% of the Total Asset of SAIL is financed by the Retained Earning. It indicates a good financial health for the company as it uses its own fund rather than much resorting to leverage. The ratio showing an upward trend indicates a good profit growth of the company.





Graph 5: Equity to Debt Ratio

Higher the Equity-Debt ratio, higher is the Long-term Solvency of the company. The figure shows that SAIL has on an average 40.2% equity to debt ratio, that indicates a good mix of equity and debt and the sufficiency of equity of the company to meet the debt obligation in the long term.



Graph o: Net Sales to Total Assets

The downward trend of the graph indicates the poor performance of SAIL to generate sales out of its assets employed. Except 2006-07, the Sale is falling consecutively, which draws immediate attention.

6. CONCLUSION:

From the analysis of the financial position of SAIL, following conclusions are arrived:

- The company performs overall well given the Altman's Z score lying above 3, which is way more than the bankruptcy level of 1.8
- The company maintains a sound operational efficiency in terms of positive working capital. Its current assets are mostly financed by operating profit rather than short-term debt.
- However, the company had been performing poorly post 2006-07 to generate Sales and Operating profit (EBIT) out of its total assets employed, which needs to be given focus immediately.
- The company has a good equity-debt mix and has a long-term solvency to meet its future debt obligation out of its equity capital.



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