



APPLICATION OF Z SCORE ANALYSIS IN EVALUATING STEEL INDUSTRY IN INDIA

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ABSTRACT

The paper is an empirical study to understand the financial soundness of steel industry in India. For this purpose twenty large and medium steel units which are listed are taken. A sample period of 2001 - 2010 was selected for the study. The financial performance of the Steel industry was monitored and measured by using Altman's Z-score model which was extensively used by practitioners and researchers in the past. This study analyses the possibility of business failure with reasonable accuracy by using the z-score model. The research findings are that the steel industry is in good financial performance inspite of the impact of sluggish demand and global economic slowdown with an exception of two companies in the study period.

KEYWORDS: *Steel Industry, Z score, Bankruptcy, Financial Soundness.*

INTRODUCTION

Companies exist for making profits and to create value to the share holder. It is very important for bankers, researchers, regulatory agencies to predict the bankruptcy to lessen the impact of it. If a company goes bankrupt / fail the shareholders of the company and also the public at large get affected. The impact is much more if it is a manufacturing industry like Steel. "Failure" is defined as the inability of a firm to pay its financial obligations as they mature (Beaver, 1966). The aim of the study is to identify the financial soundness of an industry like steel and understand the financial position and predicting bankruptcy using the model proposed by Altman. To achieve this, a sample of twenty large and medium listed steel companies for the period 2001 - 2010 is selected.

Steel is crucial to the development of any modern economy and is considered to be the backbone of human civilization. India is the 5th largest producer of crude steel in the world and is expected to become the second largest producer by 2015-16 (www.steel.gov.in). India has one of the lowest consumption rates in the world with per capita consumption of steel around 49 kg against the world average of 182 kg. The competitive advantage for India's iron and steel industry is the domestic availability of significant reserves of high quality iron ore (a key raw material input to steel making), predominantly in the east of India. The Government of India had announced a new National Steel Policy not impressed by the Tenth Plan target of 38 million tones. The policy aimed at achieving a production level of 110 million tonnes by 2019-20, of which the domestic consumption was aimed to rise to 90 million tonnes and exports to 26 million tonnes. According to a study carried out by the International Iron and Steel Institute, the demand in India is projected to a level of 180 million tonnes by 2020.

Altman developed a z-score model which is the most renowned model which uses multiple discriminate analysis based on business failures. Altman Z-score model is used for detecting bankruptcy early by analysts, rating agencies, investment firms, traders and academics. Z-score uses a combination of five financial ratios that predict the final score as no single ratio can provide a complete picture of a company's financial position. The Z score for a company is the weighted average of financial ratios which has the following formula.

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

where

Z = weighted average of five ratios

X1 = working capital / total assets

X2 = retained earnings / total assets

X3 = profit before interest and tax / total assets

X4 = market capitalization / book value of debts

X 5 = Revenue / total assets

As per Altman's model companies that have a Z-score of > 2.7 are considered as successful companies compared to those which have a Z-score of < 1.8 which may have potential serious problems and have high probability of failure or bankruptcy. For a company whose Z-score falls between 2.7 and 1.8, the company is in a grey zone and should be under careful watch. With the help of this model the overall financial soundness of Steel Industry during the sample period is monitored and measured.

REVIEW OF RESEARCH

Bankruptcy prediction using various models and financial ratios is an interesting phenomena used across industries all over the globe and dates back to 1932. Wang and Campbell (2010) tested the accuracy of Altman's z- score model in predicting failure of publicly listed companies

in China. According to Altman (1968), the bankruptcy prediction model is an accurate forecasting tool to predict failure for two years prior to bankruptcy. Accuracy diminishes as the time increases. Alkhatib and Bzour (2011) have proved that Altman's model has the ability to predict bankruptcy with a 93.8 percent prediction five years prior to liquidation. Beaver (1966) in his research adopted univariate discriminant analysis (UDA) and concluded that financial ratios of failing firms differ from those of non-failed firms. Charitou *et al.* (2000) concluded that the ratio of retained earnings to total assets maintains its unique ability to predict failure in two years prior to failure. The vast number of corporate failure resulted in models, which try to give early warning indicators of financial distress, developed by various renowned researchers ranging from academicians to practitioners. Morris (1997) suggests that the best-known models are Altman's ZETA in the USA, Taffler's Z-score models in the UK and they have been in commercial use for about 20 years. Shukla (1994) raises the question about, why some organizations prosper and grow, while others collapse and disintegrate. The success of the Altman model in predicting financial distress was proved by researchers in the past (Nikolaos Gerantonis *et al.*, 2009). So in this study this model is to be applied to Indian steel industry to monitor the performance.

METHODOLOGY

The study has been confined to twenty randomly selected large and medium steel companies listed in NSE / BSE. Ten years data 2001-2010 was collected for analyzing the financial performance and the data is taken from Capitaline database. The objectives of the study are:

- To examine the financial performance of Indian Steel Industry.
- To predict the financial health and viability of steel companies.

EMPIRICAL RESULTS

TABLE 1 : THE LIST OF SAMPLE STEEL COMPANIES TAKEN FOR THE STUDY

S No.	List of Sample Steel Companies	Category
1	SAIL Ltd.	Large
2	Tata Steel Ltd.	Large
3	Bhushan Steel Ltd.	Large
4	JSW Steel Ltd.	Large
5	Surya Roshini Ltd.	Medium
6	Mukand Ltd.	Medium
7	Llyods Steel Ltd.	Medium

8	Mahindra UGINE	Medium
9	Anil Special Steel Ltd.	Medium
10	Gandhi Special Tubes Ltd.	Medium
11	Uttam Galva Steels Ltd.	Medium
12	Sunflag Iron & Steel Ltd.	Medium
13	Jai Corporation Ltd.	Medium
14	Bhuwalka Steel Ltd.	Medium
15	Shah Alloys Ltd.	Medium
16	Ratnamani Metals & Tubes Ltd.	Medium
17	Pennar Industries Ltd.	Medium
18	Usha Martin Ltd.	Medium
19	National Steels & Agro Industries Ltd.	Medium
20	Ruchi Strips and Alloys Ltd.	Medium

Source: www.capitaline.com

TABLE 2: TABLE SHOWING WORKING CAPITAL / TOTAL ASSETS OF SAMPLE STEEL COMPANIES (2001-2010)

List of Sample Steel Companies	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001
SAIL Ltd.	0.44	0.49	0.50	0.44	0.29	0.26	-0.05	0.00	0.02	0.08
Tata Steel Ltd.	0.03	0.01	0.64	0.30	-0.08	-0.12	-0.19	-0.07	0.01	0.03
Bhushan Steel Ltd.	0.14	0.09	0.16	0.21	0.22	0.33	0.34	0.30	0.35	0.30
JSW Steel Ltd.	-0.10	-0.15	-0.07	0.02	0.05	0.04	0.02	-0.02	-0.03	-0.05
Surya Roshini Ltd.	0.45	0.51	0.54	0.50	0.51	0.51	0.50	0.47	0.45	0.39
Mukand Ltd.	0.36	0.29	0.53	0.56	0.54	0.41	0.39	0.37	0.37	0.40
Llyods Steel Ltd.	-1.06	-0.32	-0.21	-0.14	-0.11	0.01	0.10	0.11	0.11	0.13
Mahindra Ugine Steel Ltd.	0.39	0.34	0.45	0.41	0.59	0.61	0.49	0.34	0.36	0.31
Anil Special Steel Ltd.	0.39	0.34	0.36	0.31	0.34	0.24	0.27	0.25	0.28	0.25
Gandhi Special Tubes Ltd.	1.22	1.70	0.94	0.79	0.54	0.63	-0.14	0.00	0.05	0.20
Uttam Galva Steels Ltd.	0.17	0.02	0.04	0.19	0.30	0.18	0.16	0.12	0.10	0.04
Sunflag Iron & Steel Ltd.	0.52	0.44	0.49	0.42	0.40	0.43	0.29	0.27	0.25	0.25
Jai Corporation Ltd.	0.22	0.26	0.22	0.27	0.27	0.54	0.46	0.49	0.27	0.23
Bhuwarka Steel Ltd.	0.42	0.36	0.50	0.62	0.49	0.51	0.50	0.50	0.51	0.48
Shah Alloys Ltd.	0.35	0.31	0.36	0.34	0.45	0.40	0.59	0.51	0.44	0.43

Ratnamani Metals & Tubes Ltd.	0.48	0.30	0.37	0.30	0.25	0.09	0.34	0.38	0.42	0.36
Pennar Industries Ltd.	0.55	0.56	0.49	0.43	0.42	0.38	0.37	0.37	0.41	0.48
Usha Martin Ltd.	-0.23	0.03	0.20	0.24	0.23	0.27	0.28	0.27	0.25	0.21
National Steel & Agro Industries Ltd.	0.67	0.59	0.66	0.63	0.59	0.54	0.55	0.58	0.49	0.39
Ruchi Strips and Alloys Ltd.	0.49	0.40	0.61	0.68	0.69	0.71	0.66	0.62	0.60	0.56

Source: www.capitaline.com

Working Capital to total assets is one of three liquidity ratios Altman tested in the model he has propounded. The rationale for testing this ratio is that if a company is experiencing repeated operating losses would generally suffer a reduction in current assets in relation to total assets which is captured in the working capital to total assets ratio. Lloyds Steel is in a negative position in terms of liquidity from 2006 to 2010. JSW Steel has negative ratio in 2008-2010 and Usha Martin has negative ratio in 2010. All the other steel companies are doing well in the steel industry. Cost escalation of inputs is the major reason for this. Increase in cost of raw materials like zinc up to 100 percent and high cost of captive power (due to rise in furnace oil prices) has actually increased the working capital requirement of companies. This resulted in non availability of working capital funds and lower capacity utilization for most of the steel companies.

**TABLE 3: TABLE SHOWING RETAINED EARNINGS / TOTAL ASSETS OF SAMPLE STEEL COMPANIES
(2001-2010)**

List of Sample Steel Companies	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001
SAIL Ltd.	0.59	0.67	0.73	0.61	0.50	0.38	0.07	-0.10	-0.08	0.02
Tata Steel Ltd.	0.58	0.42	0.47	0.56	0.75	0.66	0.53	0.38	0.38	0.46
Bhushan Steel Ltd.	0.25	0.20	0.22	0.26	0.29	0.34	0.36	0.36	0.40	0.41
JSW Steel Ltd.	0.43	0.39	0.47	0.52	0.46	0.38	-0.02	-0.10	-0.09	-0.04
Surya Roshini Ltd.	0.24	0.27	0.26	0.25	0.26	0.25	0.23	0.21	0.20	0.26
Mukand Ltd.	0.50	0.54	0.34	0.37	0.32	0.28	0.17	0.17	0.26	0.24
Llyods Steel Ltd.	-1.56	-1.17	-0.97	-0.80	-0.66	-0.54	-0.54	-0.49	-0.32	-0.18
Mahindra Ugine Steel Company Ltd.	0.27	0.27	0.31	0.36	0.45	0.28	0.06	0.02	0.13	0.19
Anil Special Steel Ltd.	0.29	0.27	0.26	0.26	0.16	0.11	0.01	-0.32	-0.25	-0.14
Gandhi Special Tubes Ltd.	0.93	0.91	0.89	0.86	0.83	0.77	0.70	0.65	0.59	0.59
Uttam Galva Steels Ltd.	0.26	0.32	0.35	0.29	0.21	0.23	0.14	0.11	0.09	0.10
Sunflag Iron & Steel Ltd.	0.34	0.26	0.22	0.20	0.16	0.19	0.11	0.09	0.07	0.04
Jai Corporation Ltd.	0.98	0.98	0.96	0.80	0.88	0.89	0.95	0.93	0.91	0.91
Bhuwalka Steel Ltd.	0.11	0.11	0.17	0.18	0.16	0.16	0.13	0.11	0.10	0.15
Shah Alloys Ltd.	-0.08	0.00	0.14	0.35	0.31	0.41	0.34	0.31	0.24	0.28

Ratnamani Metals & Tubes Ltd.	0.52	0.58	0.56	0.40	0.39	0.41	0.58	0.58	0.54	0.56
Pennar Industries Ltd.	0.40	0.39	0.38	0.19	0.15	-0.01	0.02	0.03	0.09	0.22
Usha Martin Ltd.	0.63	0.40	0.46	0.47	0.44	0.34	0.31	0.32	0.29	0.35
National Steel & Agro Industries Ltd.	0.22	0.20	0.35	0.33	0.31	0.29	0.31	0.43	0.43	0.47
Ruchi Strips and Alloys Ltd.	0.19	0.20	0.09	0.10	0.11	0.11	0.08	0.07	0.07	0.13

Source: www.capitaline.com

Retained earnings to total assets ratio measures the cumulative profitability over time and indicates the extent to which assets have been paid for by company profits. A low ratio may mean that growth is not truly growth because the company is financed from increasing debt, instead of reinvesting profits. An older company would have had more time to accumulate earnings, so this measurement tends to create a bias towards older companies, although given the incidence of failure is higher amongst smaller and newer companies. The firms with high retained earnings relative to total assets have not used much debt as they have financed their assets through retention of profits. Lloyd's steel has not been performing well in the sample period i.e. (2001-2010). Shah Alloys which is in the mid segment has declined profitability since 2009. The reasons for both the companies not doing well are high cost of inputs and high cost of funds because of the increasing trend of interest rates. The falling global demand for steel because of recession and decline in exports hit EBIT and thereby the retained earnings of these companies.

TABLE 4: TABLE SHOWING EBIT / TOTAL ASSETS OF SAMPLE STEEL COMPANIES (2001-2010)

List of Sample Steel Companies	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001
SAIL Ltd.	0.21	0.27	0.45	0.45	0.37	0.62	0.26	0.07	-0.01	0.05
Tata Steel Ltd.	0.15	0.15	0.18	0.27	0.44	0.56	0.37	0.22	0.08	0.11
Bhushan Steel Ltd.	0.09	0.08	0.09	0.10	0.08	0.12	0.11	0.10	0.12	0.11
JSW Steel Ltd.	0.17	0.07	0.19	0.23	0.19	0.27	0.17	0.02	0.00	0.02
Surya Roshini Ltd.	0.11	0.12	0.11	0.10	0.11	0.09	0.10	0.11	0.12	0.12
Mukand Ltd.	0.08	-0.01	0.12	0.14	0.15	0.18	0.11	0.02	0.05	0.10
Llyods Steel Ltd.	-0.04	-0.14	0.00	-0.01	-0.02	0.11	0.01	-0.07	-0.09	-0.06
Mahindra Ugine Steel Company Ltd.	0.10	0.01	0.14	0.21	0.43	0.49	0.14	-0.03	0.07	0.01
Anil Special Steel Ltd.	0.10	0.09	0.08	0.15	0.10	0.10	0.09	0.04	-0.01	-0.05
Gandhi Special Tubes Ltd.	0.36	0.27	0.37	0.33	0.37	0.40	0.31	0.25	0.24	0.23
Uttam Galva Steels Ltd.	0.12	0.13	0.16	0.18	0.14	0.23	0.14	0.13	0.03	0.04
Sunflag Iron & Steel Ltd.	0.21	0.14	0.13	0.13	0.15	0.18	0.09	0.09	0.10	0.13
Jai Corporation Ltd.	0.03	0.02	0.05	0.20	0.03	0.04	0.15	0.08	0.11	0.16
Bhuwarka Steel Ltd.	0.11	0.04	0.15	0.16	0.12	0.15	0.15	0.13	0.14	0.08
Shah Alloys Ltd.	-0.02	-0.11	-0.16	0.13	0.14	0.22	0.20	0.21	0.14	0.14

Ratnamani Metals & Tubes Ltd.	0.21	0.28	0.42	0.36	0.30	0.25	0.18	0.13	0.12	0.12
Pennar Industries Ltd.	0.28	0.22	0.20	0.11	0.24	0.07	0.06	-0.05	-0.14	-0.18
Usha Martin Ltd.	0.11	0.14	0.16	0.15	0.14	0.11	0.09	0.09	0.08	0.12
National Steel & Agro Industries Ltd.	0.22	-0.02	0.14	0.12	0.12	0.09	0.08	0.10	0.09	0.08
Ruchi Strips and Alloys Ltd.	0.15	-0.08	0.15	0.15	0.12	0.10	0.06	0.05	0.02	0.00

Source: www.capitaline.com

EBIT to total assets ratio is a common variant of the return on assets. It measures how efficiently profits are being generated using the assets a company employs. The more profitable a company is, the less likely it will go bankrupt. A low EBIT to total assets ratio relative to other players in the industry indicates inefficient use of business assets. Continuous reduction of import duty by Indian Government and dumping of finished steel because of liberalized EXIM policy in India has reduced EBIT and inturn the profits of steel companies. Lloyd's steel in the mid segment has negative EBIT to total assets ratio in the sample period. Mukund Alloys, National Steel & Agro industries and Ruchi Strips and Shah Alloys has negative ratios in 2008-09 which could be probably the impact of global economic slowdown on steel consumption and the lack of investment in infrastructure projects. The reasons for this decreasing earnings to total assets are sudden fall in international steel prices by 50 percent, global recession and fall in steel exports, rupee depreciation vis-à-vis dollar by more than 15 percent, export realization becoming difficult on account of discounts sought by customers, selling price touching low levels, demand going down and the steel companies were forced to reduce production.

**TABLE 5: TABLE SHOWING MARKET VALUE / BOOK VALUE OF SAMPLE STEEL COMPANIES
(2001-2010)**

List of Sample Steel Companies	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001
SAIL Ltd.	1289	585	1367	1124	1128	1042	1094	595	295	211
Tata Steel Ltd.	135	45	170	109	169	174	116	57	38	35
Bhushan Steel Ltd.	7.81	3.53	7.36	7.63	3.53	4.64	1.69	0.79	0.37	0.42
JSW Steel Ltd.	60.8	14.0	51.4	34.4	25.4	30.8	117.4	103.2	45.6	79.7
Surya Roshini Ltd.	2.46	0.88	2.07	2.01	2.89	1.69	0.97	0.61	0.59	0.58
Mukand Ltd.	6.98	2.70	7.50	7.23	11.94	14.66	6.25	1.12	0.21	0.39
Llyods Steel Ltd.	-13.6	-2.8	-7.6	-4.8	-8.0	-11.6	-2.1	-0.9	-0.6	-3.4
Mahindra Ugine Steel Company Ltd.	4.14	1.29	3.44	5.82	9.93	13.06	4.72	2.29	0.77	1.12
Anil Special Steel Ltd.	0.65	0.35	0.39	0.53	0.79	0.88	-0.30	-0.01	0.00	-0.01
Gandhi Special Tubes Ltd.	1.90	0.89	2.70	1.20	1.86	0.93	0.57	0.34	0.42	0.39
Uttam Galva Steels Ltd.	18.72	4.48	6.64	6.28	9.23	16.52	3.07	2.33	0.95	0.42
Sunflag Iron & Steel Ltd.	19.56	9.44	18.52	12.92	20.00	20.66	9.16	5.37	2.75	4.58
Jai Corporation Ltd.	31.35	9.87	64.07	4.64	0.34	0.26	0.27	0.11	0.13	0.12
Bhuwarka Steel Ltd.	0.72	0.40	0.85	0.39	0.42	0.46	0.10	0.09	0.09	0.16
Shah Alloys Ltd.	-2.13	2.34	1.28	1.32	2.96	0.97	0.54	0.18	0.13	0.11

Ratnamani Metals & Tubes Ltd.	5.90	2.65	2.96	3.85	3.08	1.39	0.47	0.13	0.19	0.17
Pennar Industries Ltd.	32.33	22.94	40.53	32.06	32.01	-1.60	-0.46	-0.49	-1.29	0.41
Usha Martin Ltd.	62.70	16.93	57.69	6.08	6.29	2.82	1.22	0.87	0.51	0.94
National Steel & Agro Industries Ltd.	1.76	0.82	1.36	1.13	1.53	2.55	0.82	0.54	0.17	0.16
Ruchi Strips and Alloys Ltd.	6.70	3.39	3.17	2.12	1.72	2.96	0.98	0.36	0.20	0.25

Source: www.capitaline.com

Market value of equity to total liabilities is a common indicator of bankruptcy. The measure shows how much the firm's assets can decline in value before the liabilities exceed the assets and the firm becomes insolvent. Market does not perceive the decline in the profitability of a company favorably so market value of equity falls. Companies like Lloyds steel with high debt burden and with low equity-to-debt ratio are more likely to suffer bankruptcy. Lloyds steel has negative market value of equity to total liabilities from 2001-2010. Lloyd's steel went in for debt restructuring. The restructuring proposals are at various stages of discussion with the lenders. Though Lloyds was facing a very difficult situation it could pay off Rs 100.23 crore during 2010 towards the past debt obligations. Shah Alloys had accumulated huge losses by 2010 because of low demand in domestic and international market which exceeded the net worth of the company. The company is stabilizing its position by introducing new value added products to its product range in the domestic market.

TABLE 6: TABLE SHOWING SALES / TOTAL ASSETS OF SAMPLE STEEL COMPANIES (2001-2010)

List of Sample Steel Companies	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001
SAIL Ltd.	0.88	1.36	1.76	1.84	1.93	1.99	1.76	1.25	0.93	0.87
Tata Steel Ltd.	0.43	0.47	0.49	0.83	1.40	1.62	1.51	1.32	0.93	0.81
Bhushan Steel Ltd.	0.39	0.53	0.63	0.94	1.02	1.38	1.14	0.96	1.08	0.96
JSW Steel Ltd.	0.91	0.79	0.83	0.95	0.80	0.96	0.57	0.41	0.31	0.22
Surya Roshini Ltd.	2.04	2.49	2.38	2.19	2.28	2.42	2.00	1.82	1.63	1.48
Mukand Ltd.	0.61	0.67	1.06	1.17	1.02	1.02	0.71	0.53	0.45	0.60
Llyods Steel Ltd.	6.04	3.82	2.87	1.93	1.42	1.16	0.56	0.38	0.19	0.25
Mahindra Ugine Steel Company Ltd.	2.30	2.40	2.18	2.28	2.98	3.77	2.78	2.15	1.72	1.59
Anil Special Steel Ltd.	1.72	1.68	1.55	1.66	1.49	1.33	1.24	0.90	0.31	0.75
Gandhi Special Tubes Ltd.	0.83	0.74	1.20	1.17	1.26	1.40	1.30	1.09	0.97	1.00
Uttam Galva Steels Ltd.	1.59	2.01	1.91	1.75	1.58	2.81	2.21	1.72	1.25	1.43
Sunflag Iron & Steel Ltd.	1.96	1.92	1.92	1.96	2.26	2.23	1.50	1.27	1.07	1.05
Jai Corporation Ltd.	0.16	0.15	0.12	0.64	0.68	1.03	0.76	0.97	0.88	1.25
Bhuwalka Steel Ltd.	3.11	3.99	4.46	4.84	5.76	5.06	3.94	2.89	2.81	2.23
Shah Alloys Ltd.	1.09	1.15	1.31	2.09	1.73	3.39	3.19	3.16	2.45	2.50
Ratnamani Metals & Tubes ltd.	1.32	2.15	2.35	1.89	1.86	2.04	2.56	2.15	1.81	1.73
Pennar Industries Ltd.	2.36	2.25	2.08	1.32	2.42	1.45	0.69	0.42	0.28	0.65
Usha Martin Ltd.	0.83	0.92	1.00	1.07	1.05	0.98	0.65	0.62	0.72	0.85
National Steel & Agro Industries Ltd.	4.70	5.13	4.46	4.12	4.53	3.57	3.05	3.99	3.26	2.46
Ruchi Strips and Alloys Ltd.	4.18	3.70	5.30	7.13	4.82	4.95	4.20	3.63	3.04	1.97

Source: www.capitaline.com

Net sales to total assets measure the ability of the company's assets to generate sales. A low ratio relative to its peers indicates that the total assets of the business are not providing adequate revenue. It varies greatly from one industry to another. This ratio is strong across all the sample companies in the steel industry. The steel industry has been hit hard because of global meltdown which actually reduced sales and thereby production also. The steel companies on an average export 2.46 million tonnes of their production per annum.

TABLE 7: TABLE SHOWING Z SCORE OF SAMPLE STEEL COMPANIES (2001-2010)

List of Sample Steel Companies	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001
SAIL Ltd.	777	355	825	679	681	630	659	358	178	128
Tata Steel Ltd.	83	28	104	68	105	109	73	37	25	23
Bhushan Steel Ltd.	5.9	3.3	5.8	6.5	4.1	5.4	3.4	2.6	2.7	2.5
JSW Steel Ltd.	38	10	33	23	17	21	72	62	28	48
Surya Roshini Ltd.	4.8	4.4	5.0	4.7	5.4	4.7	3.8	3.4	3.2	3.1
Mukand Ltd.	6.19	3.34	7.07	7.16	9.78	11.31	5.54	1.94	1.56	1.98
Llyods Steel Ltd.	-5.72	-0.32	-3.31	-2.29	-4.50	-6.15	-1.28	-0.96	-0.79	-2.06
Mahindra Ugine Steel Company Ltd.	5.95	4.01	5.69	7.48	11.68	14.36	6.73	3.87	3.01	2.95
Anil Special Steel Ltd.	3.32	2.98	2.85	3.20	2.93	2.63	1.71	0.88	0.25	0.69
Gandhi Special Tubes Ltd.	4.84	3.81	5.67	4.57	5.18	4.74	4.13	3.47	3.33	3.21
Uttam Galva Steels Ltd.	13.78	5.58	6.94	6.73	8.24	14.03	4.89	3.84	2.16	1.99
Sunflag Iron & Steel Ltd.	15.49	8.94	14.35	10.91	15.46	15.99	7.80	5.25	3.45	4.57
Jai Corporation Ltd.	20.71	7.81	40.35	5.53	2.53	3.20	3.31	3.19	2.91	3.39
Bhuwalka Steel Ltd.	4.55	4.93	6.29	6.61	7.23	6.67	5.28	4.14	4.10	3.39
Shah Alloys Ltd.	0.06	2.57	2.20	4.23	4.95	5.77	5.37	5.02	3.87	3.93
Ratnamani Metals & Tubes Ltd.	6.84	5.81	6.73	6.33	5.56	4.39	4.64	3.91	3.58	3.44

Pennar Industries Ltd.	23.90	17.96	28.18	21.70	23.14	1.16	1.07	0.45	-0.34	1.20
Usha Martin Ltd.	39.43	12.14	37.01	6.15	6.19	3.84	2.46	2.21	2.00	2.56
National Steel & Agro Industries Ltd.	7.59	6.55	7.02	6.42	6.97	6.45	4.88	5.95	4.86	3.93
Ruchi Strips and Alloys Ltd.	9.54	6.22	8.55	9.85	7.24	8.05	5.90	4.85	4.03	2.96

Source : Calculated

As per the Altman's model, the companies that have a Z-score of > 2.7 are considered as a good signs of being successful and financially sound. The sample companies which fall under this category are SAIL, Tata steel, Bhushan, JSW Steel in the large category and Pennar Industries, Usha Martin, Jai Corporation, Sunflag Iron & Uttam Galva Steels Ltd in the medium category. However, for companies whose Z-score falls between 2.7 and 1.8, means the company is in a grey zone and should be kept under careful watch. Shah Alloys from 2008 falls into this category. If the Z score of a company < 1.8 falls into the red zone and indicate a high probability of bankruptcy. Lloyd's steel falls into this category. This company is unable to do well for a long time and also gone in for restructuring. All the ratios used by Altman in arriving at the Z scores are all interrelated. For a steel company like Lloyd with high operating leverage, when sales decline, sales to assets ratio also decline. Decline in sales result in fall in EBIT and fall in retained earnings to Assets ratio. Market does not perceive the decline in the above key ratios favorable and market value of equity also declines. The decline in the market value of equity causes a dip in the firm value and an increase in the financial leverage of the firm. Higher debt for the firm results in higher probability of distress and this chain of events results in decline of the Z score. Unless something drastic is done, the company very soon may turn bankrupt. Shah Alloys also from 2008 is moving from grey to red category in terms of its financial position. The reason for this is that the company has incomplete expansion projects which started in early 2007 which put an additional burden of interest cost. The falling domestic and export sales also took a toll on the company's financials. These companies need to put in efforts to increase the Z score. This will help Shah Alloys to avoid any damage to its liquidity and solvency positions thereby avoiding financial distress.

CONCLUSION

It is very common for companies to go through ups and downs in terms of performance because of the impact of business cycles and other macro economic variables. If the situation continues for a longer duration the company may go into bankruptcy. The overall performance of sample companies taken in the steel industry is good except Lloyd's steel which is already into problems and debt restructuring. If companies have the ability to improve their financial position during the years then Altman z-score is useful tool to predict failure early so that the company takes measures like debt restructuring or to proceed with a merger with other companies.

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