



PREDICTION OF INDUSTRIAL SICKNESS IN STEEL INDUSTRIES IN INDIA

Jay Desai¹ and Nisarg A Joshi²

¹B. K. School of Business Management, Gujarat University, Ahmedabad

²Institute of Management, Nirma University, Ahmedabad

ARTICLE INFO

Article History:

Received 5th October, 2017

Received in revised form 10th

November, 2017

Accepted 26th December, 2017

Published online 28th January, 2018

Key words:

Industrial sickness, bankruptcy, steel,

Altman, Z - score

ABSTRACT

Sickness is that a firm or company having losses continuously from last many years. If there is losses for one year and in another year it will be profit and this is continuously happened than it is not be said that industry is sick. There is external and internal cause of sickness. Internal causes like improper planning, poor management. External causes like changes in consumer demand, government policies and technological changes. In this paper, we are using Altman's Z score model for prediction of sickness. With the help of this model there should be prediction that company is going towards sickness is not.

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INTRODUCTION

In the past few decades, the asset in management literature and research has been upon the achievement and success of companies doing business. The subject of company failure has received virtually little attention from writers, academicians and management specialists.

The failure of a business is an event which brings a lot of mental pain to entrepreneurs, managers and to their family. The society is also affected by the business failure, as employment goes up, availability of goods and services decreases and cost goes up. The shareholders lose their savings; creditors lose their cash and future business. Thus coherent framework setting out the causes and symptoms of industrial sickness and developing a model predicting the potential industrial sickness is the need of hour. Such a coherent and systematic body of knowledge about corporate sickness would serve to minimize, if not eliminate, such losses by providing ample warning in advance to those concerned.

The phenomenon of industrial sickness, both in large and small scale industry, has become alarming in recent years. About Rs.3590 crores are locked up in sick industrial unit. These include both small and large scale industries. According to RBI report on currency and finance 1983-84 (latest statistics available on industrial sickness in the country), there were 463 large industrial unit availing of bank credit of Rs. 1 crores and above and 64388 small scale industrial unit on the sick lists as

at end June 1983. About Rs.2539 crores of bank loan stands locked up in these units. This constitutes a 20% increase in outstanding bank loan to sick unit in just 1 year (Rs.2122 crores in 1982). In just over 2 years since 1981, the number of sick industrial unit has more than doubled and rise of industrial sickness seems to be unabated. Although one third of large and medium size sick industrial unit belong to the textile industry, more and more unit of the industries are also added to the sick list every year. No statistics are available on how many industrial units in the country are prone to sickness. If statistics were work out on some criterion of an industrial unit being prone to sickness, it would more than likely indicate that industrial sickness has been growing at an alarming proportion.

The data availability position regarding industrial sickness is itself far from satisfactory. There are no comprehensive reviews of sick industries published by the government except occasional statement and announcement of government takeover of sick units. The RBI collects data on the monetary involvement of banks in sick units. However, this data does not indicate the actual or likely loss of employment and output arising out of the sickness of industrial units.

The state-wise breakup of sick large and medium scale units shows that six states-west Bengal, Maharashtra, Tamilnadu, Gujarat, Uttar Pradesh and Karnataka-account for the major share of bank credit outstanding against such units. As at the end of June 1978,1979,1981,1982 and 1983, these six states accounted for more than 80% of credit outstanding against such sick units. And even within these six state, the three states

***Corresponding author: Jay Desai**

B. K. School of Business Management, Gujarat University, Ahmedabad

of west-Bengal, Maharashtra and Tamilnadu accounted for more than 50% of outstanding credit as on these dates.

The state-wise distribution of sick small scale sector units shows that at end of December 1979, west bangal had the highest number of such units followed by Maharashtra, Andhra Pradesh, Uttar Pradesh, Karnataka and Assam. Tamilnadu, Gujarat, Bihar and Orissa also had sizeable number of sick small scale units at the end of the December 1979.

The progressive increase in industrial sickness has been causing considerable concern to the Government, Financial Institutions and Banks. The common effects of such sickness are locking up of financial resources, wastages of capital assets, loss of production and decrease in employment. It has become a national problem requiring a comprehensive redress rather than inventing quick fixes to revive sick units. A coherent framework consisting of the dynamics of sickness and a forewarning system is, thus, needed to identify the incidence of sickness in different industries, so that timely actions can be initiated to stem it and even overcome where ever possible. The intervention may involve change in management of the firm, grant of additional funds or funding by other organization jointly to prevent and further sickness. Appropriate remedial action will be depending on the diagnosis of the causes of the sickness and in the identification of the critical parameter responsible for it. Sickness in units has to be predicted and key parameter identify to monitor its incidence is, thus, very necessary so that timely and prompt action can be taken to stem further growth of industrial sickness in the country.

Sickness in industries has been viewed in several ways. Walter and Donaldson has termed as technical insolvency when a firm is unable to meet its maturing obligations. Others restrict the term to the so called real insolvency case where the total value of the firm's assets is smaller than its liabilities. Sometimes business failure is interpreted in the strict legal sense of bankruptcy or liquidation when the firm ceases its operation.

According to ICICI, "sick industry" is one whose financial viability is threatened by adverse factors present and continuing. The adverse factors might relate to management, market, fiscal burden, labour relations or any others. When the impact of these factors reaches a point when a company begins to incur cash losses leading to erosion of its funds, there is a threat to its financial viability. The financial bill, 1977 contained a clause defining a sick unit as one whose 50% or more of capital reserves were wiped out by the losses.

A sick unit is defined by RBI as a unit which has incurred cash losses for one year and in the judgement of the bank, it is likely to continue to incur cash losses for the current year as well as the following year and which has an imbalance in its financial structure such as current ratio of less than 1.1 and worsening debt equity ratio. This definition sick to emphasize operational performance and financial position which are interrelated to each other. Keeping the above in view, there can be at least three different view point in defining sickness.

1. At the government level in India, corporate sickness gets recognized generally only when unit is on the brink of closure its doors, throwing a large number of a people out of employment.

2. At the lending institution level, the problem gets recognized when non-payment of installment due to money lent start and continues for two or three intervals i.e. recovery of money lent becomes uncertain.
3. From the shareholder point of view, an enterprise is considered sick if it fails to pay responsible dividends and the future also looks bleak and share value tumbles down.

A review of three different view-point defining sickness brings to bear that the third view is nearer the economic sense of the term 'failure'. It is related to earning potential of the enterprise and the second view is nearer to the business sense of the term 'failure'.

Non-payment of dividend will almost invariably precede the default on debt obligation, and the default on the letter will ordinary precede the cessation of operation. Hence, these different view-points may be said to represent stage of sickness.

Sickness in an industry is an organic process in the life history of a unit. A healthy unit may grow sick temporarily and may recover of vice-versa. Factor that causes sickness could be internal or external. The external factors usually affect all the industrial unit of same group while the internal factors may affect a particular unit only and not the whole industry. In such cases, the sickness has an origin followed by several stages of sickness.

It is a well-established fact that earlier the trouble is detected, more easily and economically it may be countered. Early detection of sickness possibly may enable the management to take timely action to avert the crisis of such an occurrence. If there exists a forewarning system which helps in predicting corporate sickness, the attention can be focused on those concerns which are trudging toward sickness. The chairman of the Industrial finance corporation of India (IFCI) mentioned on 33rd annual general meeting about the importance of an effective monitoring system "One is well aware of the sickness industry. While it is not possible to avoid sickness in the industry entirely, it has come to be clearly recognized this can be feasible only when some monitoring system is in force".

Companies do not go burst 'overnight' as many people think. The process of sickness can take years and thus the seeds of sickness may be discernible very early in the story of a company's rise and decline. The forewarning system would help in reducing, it not completely eliminating, the irreparable loss to the interested parties caused by corporate collapse. The importance of such a forewarning system can be described in the words of Lev more clearly: "An early warning signal of probable failure will enable both management and investors to take preventive measures; operating policy changes, reorganization of financial structure, and even voluntary liquidation will usually shorten the length of time losses are incurred and thereby improve both private and social resources allocation'.

LITERATURE REVIEW

In 1966 William Beaver conducted a comprehensive study using a variety of financial ratios. His study was based on univariate analysis of the data under study. He made use of 30 financial ratios of 79 failed and non-failed companies and came to the conclusion that the cash flow to debt ratio was the

single best predictor (Chuvakhin&Gertmenian, 2003) that gave statistically significant signals well before actual business failure.

In 1968, Edward Altman used multiple discriminant analysis (MDA) to built a bankruptcy prediction model. Altman made use of five ratios to develop a Z Score which helped in the prediction of the financial health of a company. Altman found that his five ratios outperformed Beaver's (1966) cash flow to total debt ratio. His study was based on 60 firms in general.

In 1978 Gordon L.V.Springate developed the Springate model selecting four out of nineteen ratios that best distinguished between sound business and unhealthy business. These four ratios are working capital/total assets, net profit before interest and taxes/total assets, net profit before taxes/current liabilities and sales /total assets.

Not satisfied by the MDA model, particularly regarding the restrictive statistical requirements imposed by the model, Ohlson (1980) used logistic regression to predict company failure. He used the logit model using nine ratios to develop an estimate of the probability of failure for each firm.

Fulmer (1984) developed a model using multi discriminate analysis to evaluate forty financial ratios applied to a sample of sixty companies of which thirty were successful while thirty failed.

Keasy and Meguinness (1990) used logistic analysis and entropy analysis using sixteen financial ratios on thirty seven firms in The UK. Platt and Platt (1990) used logistic analysis on fifty seven failed and non failed companies. Again in 1991, Skogsvik performed Probit function analysis using twenty cost accounting ratios on Swedish firms. He concluded that interest expenses ratio and financial leverage ratios were highly significant.

L.C Gupta (1999) attempted to refine Beaver's method with objective of predicting the business failure. In 2002, Mansur. A.Mulla made a study in textile mills with the help of Z score model for evaluating the financial health with five weighted financial ratios. This was followed by a study by Selvam M, and others (2004) which revealed the Cement industry's financial health with special reference to India Cements Limited. Bagchi are Ratio Analysis, Multi Discriminate Analysis, Mean, Standard Deviation and Coefficient of Variation.

Beneda (2006) investigated returns, bankruptcies and firm distress for new US public companies that issued IPOs from 1995 through 2002. Beneda found that the average first year returns for IPO companies underperformed the market and that Ohlson's model was effective in identifying companies that had a higher probability of bankruptcy and financial distress and earned lower than average returns.

Ben McClure (2004) had confirmed the 'Z' score model through his research study and he concluded that to keep an eye on their investments, investors should consider checking their companies' Z-score on a regular basis. A deteriorating Z-score can signal trouble ahead and provide a simpler conclusion than the mass of ratios. Given its shortcomings, the Z is probably better used as a gauge of relative financial health rather than as a predictor. Arguably, it is best to use the model as a quick check of financial health, but if the score indicates a problem, it's a good idea to conduct a more detailed analysis.

Aziz emphasized in his article that accrual accounting ratios were shown to predict bankruptcy accurately for manufacturing industries. Such financial ratios usually lack theoretical justification. Since bankruptcy is cash oriented phenomenon, the use of variable based on cash flows is theoretically appealing. Statistics shows that more than 300 companies go out of business every week. The high rate of bankruptcy is attributed to the combined effect fierce competition in the market place and heavier debt burdens carried by the companies. While few firms were affected by the challenges, a large numbers of firms were affected by the competition.

Melody Y. King et al in their study attempted to provide an empirically support rationale for classifying the firms in to two groups, those declaring bankruptcy within two years and those remaining solvent. The apparent rationale for engaging in reverse splits differs between two groups. I.e. weak forms attempting to increase their stock price while solid firms seeking to reposition their stocks in the market. This generated an understanding of corporate rationale for engaging in reverse splits and relative success of Z score and artificial neural networks in forecasting the two groups.

Praveen katarain his study attempted to predict corporate sickness of the companies. Financial information about all the sick companies was collected for five years before sickness. Healthy companies were matched with the sick companies on the basis of industry composition size. 54 financial ratios and 8 macro economic variables were taken to study their effect along with financial ratios. Two group linear discriminate analyses were applied in two parts. In the first part, only financial ratio was taken in discriminate analysis, while the macroeconomic variable was included along with the financial ratios in the second part. The result showed that macroeconomic variable had very little impact on discriminant function.

RekhaPaidealt with the prediction of industrial sickness using multiple discriminant analysis. The data set constitutes 21 financial ratios of 34 Indian sick companies in 200001 and 38 contemporary non sick companies, both selected irrespective of size and industry category 3 years prior to sickness. The multiple discriminant analysis (MDS) showed greater accuracy in predicting industrial sickness up to three years in advance. The model was validated further using a test model, while exhibited very high predictive accuracy of the proposed model.

Ramakrishna in his paper examined two well-known financial distress model namely multiple discriminate analysis and logistic regression analysis by using a sample of 298 firms. The study found that cash flow and working capital are important predictive variables, irrespective of when compared to any other models. The selected models were also found to be capable of predicting.

Objective of the study

1. To evaluate the efficiency of selected Indian industry steel companies.
2. To examine the overall financial performance of selected Indian steel companies.
3. To forecast the financial health and viability of the selected Indian steel companies.

The present study is concerned with the analysis of financial health of Bothra, Hind, Hindalco, Hindustan, Multi Metals, Sri

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Vasavi, Parekh and Sudal. The entire study is based on secondary data. The data has been collected from websites of companies. The period of study is 2006-07 to 2013-14. Altman's model has been adopted to analyze the financial health of above all six steel companies.

Theory Framework

The first attempt to, perhaps, suggest a more effective way of diagnosing corporate insolvency was made in the works of Altman (1983) in which he used the discriminate analysis technique to calculate bankruptcy ratio. This ratio which uses the Z value to represent overall index of corporate fiscal health, is used mostly by stockholders to determine if the company is a good investment. The formula for the ratio is

$$Z=1.2x_1 + 1.4x_2+ 3.3x_3+ 0.6x_4 + 1.0x_5$$

Where,

X₁= Working capital/total asset

X₂= Retained earnings/ total asset

X₃= Earnings before interest and taxes/ total assets

X₄= Market value of equity/the book value of total of total debt

X₅= Sales/total assets.

ANALYSIS AND RESULTS

Table 1 Financial Ratios of Bothra

BOTHRA					
YEAR	X ₁	X ₂	X ₃	X ₄	X ₅
2013-14	0.171791	0.09543	0.95009	0.635596	2.049315
2012-13	0.20	0.08	0.10	0.89	2.06
2011-12	0.162611	0.074613	0.108713	0.986565	1.686478
2010-11	0.277794	0.206205	0.1484	0.931172	2.386092
2009-10	0.209282	0.200016	0.196098	0.8998	2.083929
2008-09	0.113452	0.07138	0.08972	1.122643	1.985745
2007-08	0.036046	0.05211	0.110855	8.847236	2.346861
2006-07	0.336527	0.01486	0.026056	0.903049	1.547184

Table 2 Financial Ratios of Hind

HIND					
YEAR	X ₁	X ₂	X ₃	X ₄	X ₅
2013-14	0.132454	0.316074	0.097815	0.286611	3.069591
2012-13	0.143234	0.28673	0.115041	0.237317	3.029831
2011-12	0.155291	0.254425	0.096039	0.248393	2.884247
2010-11	0.153606	0.228966	0.091691	0.275905	2.695312
2009-10	0.540854	0.358449	0.059363	0.476218	2.459191
2008-09	0.596428	0.35505	0.067494	0.244711	3.10817
2007-08	0.385454	0.347403	0.11234	0.602735	2.959599
2006-07	0.296092	0.31846	0.144468	0.45074	3.045654

Table 3 Financial Ratios of Hindalco

HINDALCO					
YEAR	X ₁	X ₂	X ₃	X ₄	X ₅
2013-14	0.127019	0.029325	0.038202	0.789885	0.377538
2012-13	0.156312	0.031551	0.03887	0.53662	0.391136
2011-12	0.115807	0.046493	0.05478	1.049517	0.47795
2010-11	0.130792	0.052366	0.061289	2.372499	0.512701
2009-10	0.199756	0.053027	0.060852	2.506408	0.467229
2008-09	0.255662	0.069964	0.83706	0.711255	0.503787
2007-08	0.441696	0.095808	0.107037	1.363626	0.621617
2006-07	0.443622	0.105025	0.150241	0.985672	0.734283

Table 4 Financial Ratios of Hindustan

HINDUSTAN					
YEAR	X ₁	X ₂	X ₃	X ₄	X ₅
2013-14	0.611895	0.686926	0.193785	1.301249	0.327186
2012-13	0.616884	0.675345	0.221752	1.443364	0.358091
2011-12	0.615786	0.655605	0.237464	1.895188	0.386817
2010-11	0.594903	0.590571	0.239452	2.319846	0.400718
2009-10	0.574466	0.52868	0.250132	2.2514	0.396458
2008-09	0.609692	0.46132	0.212238	0.118698	0.356665
2007-08	0.616676	0.406352	0.455035	0.168446	0.596468
2006-07	0.577678	0.521372	0.7404	0.271886	0.97777

Table 5 Financial Ratios of Multi Metals

MULTI METALS					
YEAR	X ₁	X ₂	X ₃	X ₄	X ₅
2013-14	0.030397	0.091742	-0.02778	0.209152	0.920738
2012-13	0.008295	0.081019	0.06823	0.209291	0.90125
2011-12	0.01388	0.071353	0.100872	0.207066	1.281353
2010-11	0.736648	0.041241	0.101426	0.170989	1.140881
2009-10	0.628483	0.018073	0.107651	0.097537	1.307703
2008-09	0.734638	-0.03288	0.151575	0.062792	1.495617
2007-08	0.463253	0.066203	0.178386	-0.00241	1.483688
2006-07	0.541627	-0.01332	0.181145	-0.00241	1.864994

Table 6 Financial Ratios of Parekh

PAREKH					
YEAR	X ₁	X ₂	X ₃	X ₄	X ₅
2013-14	0.080869	0.159133	0.121615	0.372654	0.868984
2012-13	0.162143	0.188018	0.118869	0.192824	0.912796
2011-12	0.27923	0.158251	0.105754	0.355705	0.785908
2010-11	0.337993	0.169655	0.10866	0.25775	0.795476
2009-10	0.340726	0.161475	0.109209	1.850968	0.835787
2008-09	0.361385	0.184418	0.123293	0.581583	1.008182
2007-08	0.40541	0.18323	0.111243	1.278331	0.8872
2006-07	0.616767	0.230524	0.151378	1.018383	1.312768

Table 7 Financial Ratios of Sri Vasavi

SRI VASAVI					
YEAR	X ₁	X ₂	X ₃	X ₄	X ₅
2013-14	-0.23518	-0.63704	-0.04741	-0.12667	0.887568
2012-13	-0.35522	-0.50421	-0.0566	-0.04881	0.730032
2011-12	0.106179	-0.52154	0.01348	0.033368	1.234879
2010-11	0.112169	-0.45726	-0.00904	0.07885	0.98546
2009-10	0.147898	-0.35299	-0.00914	0.138125	1.408457
2008-09	0.436726	-0.37313	0.022203	0.274137	1.079288
2007-08	0.42626	-0.30909	0.015112	0.038694	1.297218
2006-07	-0.05236	-0.66377	-0.01951	-0.24232	1.262302

Table 8 Financial Ratios of Sudal

SUDAL					
YEAR	X ₁	X ₂	X ₃	X ₄	X ₅
2013-14	0.186564	0.094787	0.070276	0.320798	0.883793
2012-13	0.050788	0.109328	0.096682	0.561369	1.265718
2011-12	0.017311	0.098146	0.092563	0.922396	1.523065
2010-11	0.107869	0.102076	0.15175	1.651602	1.87687
2009-10	0.284369	0.068256	0.199261	1.532035	1.556151
2008-09	0.048246	0.016515	0.135675	0.821351	1.489751
2007-08	0.015987	-0.12908	0.179188	0.521689	1.948662
2006-07	0.048978	-0.21511	0.123329	0.930635	1.858962

Table 9 Altman Z-Score Model Results

Company	Z score financial health	Result
Bothra	3.2827	Too Healthy
Hind	4.2299	Too Healthy
Hindalco	1.894	Healthy
Hindustan	3.624	Too Healthy
Multi Metals	2.13274	Healthy
Parekh	2.4227	Healthy
Sri vasavi	0.5053	Not Healthy
Sudal	2.69132	Healthy

RESULTS AND FINDINGS

Net Working Capital to Total Assets

Working capital is the excess of total current assets. The ratio of working capital to total assets shows liquidity position of relative to total capitalization. "Consistent operating losses will cause current assets to shrink relative to total assets. A negative ratio, resulting from negative working capital, is a serious problem". The ratio of working capital to total assets shows the liquidity position of the company.

The ratios of working capital to total assets are calculated. It is observed from the table that the ratio ranges between 0.036 to 0.33 for bithra, 0.13 to 0.59 for Hind and 0.11 to 0.4436 for Hindalco in current assets and which shows that too much of its current funds are blocked in the form of current assets instead of investing them in the potential investments. Range for Hindustan is 0.5744 to 0.6157, for multi matels it is 0.0082 to 0.7346, 0.08086 to 0.6167 for parekh, -0.5236 to 0.4367 for srivasavi and for sudal it is 0.01598 to 0.2843.

This analysis will help all the companies in maintaining the appropriate working capital i.e. neither low nor high level of investments in current assets without disturbing the basic liquidity position of the companies.

Retained Earnings to Total Assets

The ratio of retained earnings to total assets indicates that how much portion of total assets has been financed by retained earnings. Higher the ratio greater the financial stability of the company at times of low profitability periods. And also it depicts that the company utilizing its own earnings as cheaper source of finance rather than debt finance.

The percentages of retained earnings of all the three companies are furnished. From the table it is observed that on an average 0.1486 to 0.2062 of total assets of Bothra, 0.2289 to 0.3474 for Hind, 0.029 to 0.1050 for Hindalco, 0.4063 to 0.6868 for Hindustan, for multi matels it is -0.01332 to 0.09174, it is 0.1582 to 0.2305 for parekh, -0.3090 to -0.6637 for srivasavi, for sudal it is -0.1290 to 2.1093.

This study shows that these companies have been utilizing more debt rather than retained earnings. The decreasing trend of retained earnings during the study period indicates that the unsustainable growth.

EBIT to Total Assets

This ratio expresses operating performance and productivity of the assets which is mentioned in table. The ranges for variance company are stated here. For bothra it is 0.026056 to 0.9500, for Hind it is 0.05936 to 0.1444, for Hindalsco it is from 0.038 to 0.15024, for Hindustan it is 0.1937 to 0.7404, -0.02778 to 0.1811 for multi matels. 0.1057 to 0.1513 for Parekh, -0.0090 to 0.022 for Srivasavi, 0.07027 to 0.1791 for Sudal.

Book Value of Equity to Book Value of Total Debt

This ratio is used to ascertain the soundness of the long-term financial policies. The company having 1:1 equity-debt mix is considered as quite good. Excessive debt tends to cause insolvency. Fixed interest paid on debt whereas variable dividend is paid on equity. If debt is more than the equity it will reduce the profit of the company, despite increases the profitability of the shareholders. It will be a curse in times of bad performing. The relevant information of the two selected sample pharmacy companies in the pharmacy industry is furnished in the table 2 about here.

The ranges for Bothra is from 0.63 to 8.84, the ranges of Hind is 0.2373 to 0.6027, 0.5366 to 2.5064 for Hindalco, 0.1186 to 2.32 for Hindustan, -0.00241 to 0.2092 for multi metals, for parekh it is 0.1928 to 1.8509, for Sri vasavi it is -0.0488 to 0.2743, for Sudal it is 0.32079 to 1.6516

Sales to Total Assets

Sales revenue plays a pivotal role in overall performance of the

companies because all the operations are more or less depend on the sales revenue. Sales to total assets ratio measure the power of the asset in generating the sales. Higher ratio indicates the better performance and while poor ratio indicates the poor financial management of the companies in the optimum utilization of its assets in generating the sales revenue. The ratio varies from one company to another. The relevant information of the two selected sample pharmacy companies is furnished here. If we classified range for all this company, it will be said that the range for Bothra is 1.54 to 2.38, for Hind it is 2.459191 to 3.10817, For Hindalco it is 0.3775 to 0.7342, For Hindustan it is 0.3271 to 0.9777, For Multi metals it is 0.90125 to 1.8649, For parekh it is 0.7954 to 1.3127, 0.7300 to 1.4084 for Sri vasavi and for Sudal it is 0.88 to 1.9486.

Based on the information from table 2 it was crystal clear that the companies still had an opportunity to improve its sales capacity but had been totally failure to utilize their assets optimally in generating the sales revenue. It will have an adverse effect on its performance. It is suggested that the companies have to take appropriate steps in the optimum utilization of its assets in generating more and more sales revenue.

CONCLUSION

The Z score of Hindalco, Multi metals, Parekh and Sudal is 1.894, 2.13274, 2.4227 and 2.69132 accordingly. In this situation Bothra, Hind and Hindustan are in too healthy Zone where it is successful in its financial performance and not to fall bankrupt. While, Sri Vasavi is not considered as healthy company as its Z score is only limited to 0.5053. This study will be useful for all the stakeholders of steel industry.

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