Assessing the Financial Soundness of Companies with Special Reference to the Indian Textile Sector : An Application of the Altman Z Score Model

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Abstract

The Altman Z Score model is a useful tool to predict financial distress in business organizations operating across a wide variety of industries. Altman's Z score, developed by Edward I. Altman, is a multiple discriminant analytical model used to determine bankruptcy of the companies by using commonly accepted cutoff criteria. In this research work, we provide a framework for the interpretation of the Z-Score model and apply it on selected companies operating in the Indian textile industry during the period from 2006 to 2011. The Indian textile industry is one of the largest sectors in the country in terms of output and employment. Given the high vulnerability of the Indian textile companies to the currently unstable western economy and volatile sales and earnings of textile manufacturers, there is an indispensable need to assess the financial position of the Indian textile sector.

Keywords: **Altman Z score, ratio analysis, textile industry, bankruptcy**

JEL Classification: C53, G20, G33

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The business environment in the present global context has become very volatile. In recent times, lots of companies worldwide have been filing for bankruptcies, the biggest being Lehman brothers in 2008. In the Indian context also, many restructuring cases have been reported in the last few years. According to the CDR cell data, a total of 101 cases involving about ₹ 64,000 crore were referred to it in 2012 itself. In light of such volatility in the business environment, it becomes very important to measure the financial soundness of the companies to safeguard the interests of the various stakeholders associated with these companies. Financial soundness of companies can be investigated by establishing a relationship between various financial variables. Several studies have been attempted to discuss the dynamics of bankruptcies in various industries. The most prominent of the studies has been done by E. I. Altman, who developed the Altman Z score model. Altman investigated a set of financial and economic ratios and used multiple discriminant statistical methodology and predicted the bankruptcy of the sample listed firms.

In the present study, an attempt has been made to discuss and predict bankruptcy in the Indian textile industry. The textile industry was chosen for analysis as this industry was one of the most affected industries during The Great Recession of 2008 - 2009. The Indian textile industry's situation has been worsening due to increasing financial leverage due to the ongoing capex requirements. Three hundred textile cases with debt worth INR 12,000 crores have already been put forward for restructuring (Fitch Ratings, Sep 2012). Companies have suffered huge losses on account of cotton and cotton yarn price volatility in FY12. High interest rates have almost nullified the benefits of the Technology Upgradation Fund Scheme (TUFS) and power shortages have lead to lower capacity utilization.

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The Indian Textile Industry

The Indian textile industry is an important pillar for the Indian economy. As per the estimates by Crisil Research, the size of the textile industry in 2010-2011 was ₹ 640 billion. As per the 2011-2012 data by Ministry of Textiles, Government of India, the Indian textile industry contributed about 11% to industrial production, 14% to the manufacturing sector, 4% to the GDP, and 17% to the country's total export earnings. It provides direct employment to over 35 million people, and is the second largest provider of employment after agriculture in our country.

The textile industry in India comprises of scattered large players and many medium and small size companies. The Indian textile industry may be divided into different segments and sub segments. The major sub-sectors include organized cotton / man-made fibre textiles mill industry, man-made fibre / filament yarn industry, wool and woolen textiles industry, sericulture and silk textiles industry, handlooms, handicrafts, jute and jute textiles industry, and textiles exports. The Table 1 exhibits the Indian fabric production data from 2007-08 to 2011-12. The main textile clusters are Tamil Nadu, Uttar Pradesh, Maharashtra, Karnataka, Kerala, and Andhra Pradesh. The major players in this industry are Aditya Birla Nuvo Ltd., Alok Industries Ltd., JBF Industries Ltd., SRF Ltd., Garden Silk Mills Ltd., S. Kumars Nationwide Limited, Arvind Mills Ltd., and Trident Ltd. The major business areas are home textiles, yarn, fabric, spinning, weaving, processing, jute and jute textiles, sericulture, wool and woolen textiles, dyed and pronted fabric, towels and furnishings, handlooms, handicrafts, and so forth.

➔ **Textile Exports :** The share of textile exports in total exports consistently declined from 2006 to 2011. However, the growth rate of Indian textile exports increased from 11% in 2008-09 to 25% in 2010-11. To further boost up the textile exports, the ministry is mulling a series of measures like expanding the technology upgradation scheme. The Table 2 shows the status of textile exports and imports in India from 2007-08 to 2011-12. Cotton is an important component of the Indian textile industry. About 60% of the Indian textile industry is cotton based. As of 2011, India is the second largest exporter of cotton in the world, and is also the second largest producer of cotton. As we can see from the Table 2, even though the textile industry is facing a severe downturn, cotton exports have expanded significantly in the past several years.

➔ **Recent Developments in the Textile Industry :** The textile industry has seen a considerable change in the past few years. After the launch of Technology Upgradation Fund Scheme (TUFS) in 2005, most of the textile companies have been able to improve their financial performance. The net sales of the top 10 textile companies by revenue increased by a CAGR of 23% in the past 5 years ending FY11.

Table 1. Fabric Production Data

Item	Unit	2007-08	2008-09	2009-10	2010-11	2011-12 (Prov)
Cotton	Million Sq Mtr	27,196	26,898	28,914	31,718	30,593
Blended	Million Sq Mtr	6,888	6,766	7,767	8,278	8,394
100% Non-Cotton (Including Khadi, Wool)	Million Sq Mtr	21,941	21,302	23,652	22,563	22,377
TOTAL	**Million Sq Mtr**	**56,025**	**54,966**	**60,333**	**62,559**	**61,364**

Source: Textile industry overview. (2012). Retrieved from http://texmin.nic.in/ermiu/texind.pdf

Table 2. Textile Exports and Imports

Item	Unit	2007-08	2008-09	2009-10	2010-11	2011-12 (Prov)
Exports(Including Jute, Coir, & Handicrafts)	Million US$	22,165.84	21,057.06	22,426.29	27,766.11	33,161.74
Imports	Million US$	3,326.46	3,560.87	3,436.26	4,179.41	5,191.44

Source: Textile industry overview. (2012). Retrieved from http://texmin.nic.in/ermiu/texind.pdf

Review of Literature

Altman (1968) tried to assess the quality of ratio analysis as an analytical technique. The author developed the multiple discriminant analysis using a sample of 66 firms in two mutually exclusive groups: 33 bankrupt firms and 33 non-bankrupt firms in case of manufacturing corporations. The author explained that as ratio analysis is susceptible to faulty interpretation and can be analyzed subjectively, it is important to develop a model that suitably removes the possible ambiguities observed in traditional studies. The model thus developed, known as the Altman Z score model, has been extensively used in various research studies.

Altman, Haldeman, and Narayanan (1977) developed a new model to identify bankruptcy risks of the corporations. This model was named as the Zeta model and it considered the developments with respect to recent business failures. The new model was effective in classifying bankrupt companies up to 5 years prior to failure on a sample of corporations consisting of manufacturers and retailers.

Altman (2002) reviewed two important credit scoring techniques - Z-score (developed by the author himself in 1968) and KMV's EDF model with respect to default probabilities in general. According to the author, the relevance of these credit scoring models could be remotivating by changes brought about by the Basel II norms and the increasing bankruptcy filings by large corporates. Jayadev (2006) provided empirical evidence on the acceptability of the Z-score model. The author used three forms of the Z score model and estimated the coefficients in all the 3 equations by using a sample of 112 companies. The results of the study revealed that Altman's model was capable of predicting default in most of the sample companies.

Gerantonis, Vergos, and Christopoulos (2009) empirically analyzed whether the Altman Z score model can correctly predict the bankruptcy of the companies. For the purpose of this study, the author took a sample of all listed companies on the Athens exchange for a period of 2002-2008. The results showed that Altman's Z score model can predict failures. Samarakoon and Hasan (2003) investigated the ability of three versions of Altman's Z score model (Z, Z', and Z") to predict bankruptcy in listed companies in Sri Lanka. The results revealed that these models have a very high degree of accuracy in predicting corporate distress.

Ramaratnam and Jayaraman (2011) analyzed Altman's Z score model with special reference to the Indian steel industry. The authors used Altman's Z score model to predict, analyze, and compare the financial health of the major steel companies in India from 2006-2010. The Z score was further tested using the ANOVA test to analyze the consistency and stability on the different ratios used in Altman's Z score. Hayes, Hodge, and Hughes (2010) attempted to construct and interpret Z score and apply it to the retail industry in the study period from 2007 and 2008. Their study was an endeavour to show the efficacy of Altman's Z" Score in predicting financial distress in retail firms. The sample consisted of the public retail companies which had assets greater than $1,000,000 and had declared bankruptcy during 2007-2008. The results of the period under study accurately classified eight out of nine firms under investigation as bankrupt.

Raiyani and Bhatasna (2011) studied the financial health of the textile industry in India. The authors considered four major players in the Indian textile industry from the period 2002-2009 and applied the Altman Z Score model to these companies to predict, analyze, and compare the financial health of these companies. Ray (2011) made an attempt to apply Altman's Z Score model on the Indian automobile industry and tested whether the model can accurately predict the cases of bankruptcy in the Indian automobile industry for the study period from 2003-04 to 2009-10.The author considered a sample of 62 publicly traded companies listed on the Bombay Stock Exchange. Reddy (2012) made an attempt to study the association between liquidity, profitability, and risk factor. He employed Altman's Z Score model to predict the risk of financial distress of Dr. Reddy's Laboratories Ltd. considering the time period from 2005 -2011. The study revealed that the company was not suffering from financial distress.

Objectives of the Study

The main objectives of the present paper are:

Table 3 . Major Players in the Indian Textile Industry

	Company	Net Sales-2011 (₹ in cr)
1	Aditya Birla Nuvo Ltd.	6,439.19
2	Alok Industries Ltd.	6,384.29
3	JBF Industries Ltd.	3,552.70
4	SRF Ltd.	3,526.50
5	Garden Silk Mills Ltd.	3,395.50
6	Indo Rama Synthetics (India) Ltd.	2,953.62
7	S Kumars Nationwide Limited	2,757.36
8	Arvind Mills Ltd.	2,663.58
9	Trident Ltd.	2,536.99
10	Bombay Rayon Fashions Ltd.	2,254.84
11	Pradip Overseas Ltd.	2,146.28
12	Nakoda Ltd.	2,006.28
13	Century Enka Ltd.	1,651.06
14	Sutlej Textiles Industries Ltd.	1,581.98
15	Nahar Spinning Mills Ltd.	1,391.47

Source: Top companies in India by net sales BSE (n.d.). Moneycontrol.com. Retrieved from http://www.moneycontrol.com/stocks/top-companies-in-india/net-sales-bse/textiles-general.html

(a) To investigate the overall financial performance of the Indian textile industry,
(b) To predict the possibility of bankruptcy of the major players in the textile industry using the Altman's Z Score model.

➔ **Scope of the Study :** The present study focuses on predicting the bankruptcy of the top 15 players in the Indian textile industry. The sample was selected on the basis of sales turnover of FY 2011. The period of study is from 2006 to 2011. The Table 3 gives the list of the companies covered in the present study.

Methodology

➔**Collection of Data :** The study is based on secondary data analysis. The data was collected from CMIE prowess database. The supporting data was collected from moneycontrol.com and annual reports of various banks.

➔ **Tools Used:** Altman Z Score model was used to predict the bankruptcy of the firms considered for the present study.

➔ **Altman Z Score Model :** Altman's Z Score model is one of the most important models for predicting the bankruptcy of the corporates. The Z-score is a set of financial ratios in a multivariate context, based on the multiple discriminant model. Multiple discriminant analysis is a statistical technique used primarily to classify and /or make predictions in problems where the dependent variable appears in qualitative form, for example, bankrupt or non-bankrupt (Altman, 1968).

The discriminant model as given by Altman in case of manufacturing firms can be defined as:

$$Z = 1.2T_1 + 1.4T_2 + 3.3T_3 + 0.6T_4 + .999T_5$$

Where,
T_1 = working capital / total assets,

Table 4. The Altman Z Score model

Score	Zone	Interpretation
Z > 2.99	"Safe" Zones	Implies that there is low probability of bankruptcy and the company is healthy.
1.81 < Z < 2.99	"Grey" Zones	Implies that these firms are considered as cases which should be watched with attention.
Z < 1.81	"Distress" Zones	Implies that there is high probability of bankruptcy.

T_2 = retained earnings / total assets,
T_3 = earnings before interest and taxes / total assets,
T_4 = market capitalization / total debt,
T_5 = sales/ total assets.

The Table 4 shows the interpretation of Altman's Z Score model as interpreted by Altman. Altman interpreted the results in 3 different categories:

Elements of Altman's Z Score Model

➔ **Working Capital to Total Assets (T_1):** This ratio measures the relationship between working capital and total assets. Working capital is the difference between current assets and current liabilities. Current assets include inventories, receivables, cash and bank balance, and loans and advances. Current liabilities include all current liabilities and provisions. This ratio is important from the perspective of understanding the liquidity position of the firm. A firm having constant losses will have lower working capital. A low working capital to total asset ratio signifies a company's inability to meet its short-term obligations.

➔ **Retained Earnings to Total Assets (T_2):** This ratio indicates the degree of capitalization made through retained earnings or internal funds. Retained earnings include all free reserves and specific reserves and balance as per profit and loss account. This implies the total amount of profits ploughed back into the business over the life of the business. Total assets include net fixed assets, investments, current assets and loans, and advances. A higher retained earnings to total assets ratio signifies that the financial health of the company is good and the company relies lesser on debt funding (higher risk capital) and ploughs back its profits (low risk capital) towards creation of assets. If the firm is relatively young, this ratio will be lower as the retained earnings will be lesser.

➔ **EBIT to Total Assets (T_3) :** This ratio measures the productivity of the firm's assets. This ratio is very important in terms of credit risk because this measures the efficiency of the firm to use the total assets to generate earnings. EBIT implies earnings before interest and taxes. Total assets here imply net fixed assets, investments, current assets, loans, and advances. This ratio measures how effectively the company is using its total assets to generate sales.

➔ **Market Capitalization to Total Debt (T_4) :** This ratio is one of the most important ratios in measuring credit risk. Market capitalization shows the market depth of the company. It also shows the ability of the firm to raise capital from the market. This ratio measures whether the firm has sufficient capital to meet the total debt obligations. Market capitalization can be calculated by multiplying the number of outstanding shares with the market price of the share on that day. Total debt includes borrowings and current liabilities.

➔ **Sales to Total Assets (T_5):** This ratio measures the efficiency of the assets in generating sales. A higher ratio indicates that the firm is efficient in the utilization of its assets.

Table 5. Altman Z Score Model

Z Score	Name of the Company
Z > 2.99	Aditya Birla Nuvo Ltd., SRF Ltd., Bombay Rayon Fashions Ltd., Nakoda Ltd., Century Enka Ltd.
1.81 < Z < 2.99	JBF Industries Ltd. , Garden Silk Mills Ltd., Indo Rama Synthetics (India) Ltd., S. Kumars Nationwide Limited, Arvind Mills Ltd., Pradip Overseas Ltd., Sutlej Textiles Industries Ltd., Nahar Spinning Mills Ltd.
Z < 1.81	Alok Industries Ltd., Trident Ltd.

Table 6. Altman Z Score for the Sample

S.No	Name of the company	Mar-06	Mar-07	Mar-08	Mar-09	Mar-10	Mar-11	Mean
1	Aditya Birla Nuvo Ltd.	4.07	5.11	2.61	2.37	2.58	2.78	3.25
2	Alok Industries Ltd.	2.06	1.84	1.43	1.52	1.55	1.62	1.67
3	JBF Industries Ltd.	3.20	3.67	3.06	2.67	2.68	2.51	2.97
4	SRF Ltd.	3.03	3.96	2.57	2.58	3.03	3.35	3.09
5	Garden Silk Mills Ltd.	2.05	2.55	2.74	2.10	2.67	2.90	2.50
6	Indo Rama Synthetics (India) Ltd.	1.55	1.81	1.37	1.80	2.25	2.09	1.81
7	S. Kumars Nationwide Limited	2.32	3.58	2.99	2.22	2.45	2.28	2.64
8	Arvind Mills Ltd.	2.02	2.02	1.71	1.61	2.02	2.14	1.92
9	Trident Ltd.	1.06	1.08	0.67	0.55	0.82	0.87	0.84
10	Bombay Rayon Fashions Ltd.	7.82	5.38	3.16	2.37	2.22	2.29	3.87
11	Pradip Overseas Ltd.	0.64	3.20	3.56	3.60	3.34	3.38	2.95
12	Nakoda Ltd.	3.38	3.66	3.16	3.09	2.30	2.54	3.02
13	Century Enka Ltd.	2.75	2.49	2.40	3.64	3.80	2.90	3.00
14	Sutlej Textiles Industries Ltd.	1.84	2.11	1.89	1.82	2.24	2.88	2.13
15	Nahar Spinning Mills Ltd.	2.37	2.41	1.81	2.08	2.28	2.07	2.17
	Mean	2.68	2.99	2.34	2.27	2.42	2.44	2.52

Analysis and Results

The data regarding the top 15 companies (as per the sales turnover of FY 2011) were analyzed and the Z Score was obtained as per Altman's Z Score model.

➔ **Altman's Score :** The Table 5 shows the consolidated results of the Z Score as per Altman's Z Score model. The Table 5 shows the mean Z Score value of the sample companies for the last 6 years. As per the mean score, Aditya Birla Nuvo Ltd., SRF Ltd., Bombay Rayon Fashions Ltd., Nakoda Ltd., and Century Enka Ltd. had a score of Z > 2.99, which suggests that these companies were financially safe. However, the companies, namely Alok Industries Ltd. and Trident Ltd. had an average Z Score of less than 1.81, which implies that the companies were not performing well and were in the bankruptcy zone.

➔ **Analysis of the Detailed Altman Z Score and the Various Variables :** The Table 6 provides the detailed Z Score of the sample companies for the last 6 years along with the mean scores. The Table 6 shows the detailed Altman Z Score for the last 6 years. If we see the average Z Score of the 15 sample companies for the last 6 years, we can imply that the Z Score of the industry is in the *"Grey"* zone, that is, 1.81 < Z < 2.99, implying that this sector should be watched carefully in terms of default signals.

Bombay Rayon had the highest average Z Score of 3.87. The main reason for such a high Z Score was because of the exceptionally large market capitalization, especially in the year 2006. Consistent erosion in market cap over

Table 7. Working Capital/ Total Assets Ratio

S.No	Name of the company	Mar-06	Mar-07	Mar-08	Mar-09	Mar-10	Mar-11	Mean
1	Aditya Birla Nuvo Ltd.	26.03%	15.18%	18.57%	15.31%	12.50%	14.39%	17.00%
2	Alok Industries Ltd.	46.38%	40.55%	42.04%	31.37%	37.89%	35.04%	38.88%
3	JBF Industries Ltd.	22.74%	20.03%	21.70%	18.76%	12.10%	17.26%	18.77%
4	SRF Ltd.	8.88%	13.51%	12.66%	11.51%	12.80%	16.43%	12.63%
5	Garden Silk Mills Ltd.	19.44%	22.86%	32.53%	27.48%	23.51%	29.46%	25.88%
6	Indo Rama Synthetics (India) Ltd.	0.22%	5.11%	-0.63%	1.49%	3.11%	4.74%	2.34%
7	S Kumars Nationwide Limited	69.52%	72.81%	68.98%	61.38%	55.01%	59.07%	64.46%
8	Arvind Mills Ltd.	45.87%	31.49%	30.74%	26.64%	27.75%	27.32%	31.63%
9	Trident Ltd.	12.69%	12.01%	8.10%	4.95%	10.35%	13.75%	10.31%
10	Bombay Rayon Fashions Ltd.	50.29%	40.40%	51.23%	44.53%	38.15%	37.90%	43.75%
11	Pradip Overseas Ltd.	16.34%	77.78%	84.86%	86.92%	86.14%	88.63%	73.44%
12	Nakoda Ltd.	31.41%	32.90%	36.44%	37.43%	32.49%	44.23%	35.82%
13	Century Enka Ltd.	17.50%	24.25%	28.00%	21.56%	24.73%	32.76%	24.80%
14	Sutlej Textiles Industries Ltd.	35.03%	31.22%	36.95%	37.42%	35.84%	41.81%	36.38%
15	Nahar Spinning Mills Ltd.	25.51%	41.29%	45.93%	39.85%	48.36%	53.67%	42.44%
	Mean	28.52%	32.09%	34.54%	31.11%	30.72%	34.43%	31.90%

the years significantly impacted its Z Score, and hence, the score continued to fall. Aditya Birla Nuvo Ltd. has the second highest Z Score, the main reason being the highest retained earnings to total assets ratio and market capitalization to total debt ratio. The company also had an average EBIT/total assets ratio, which has the highest coefficient in the model. An important observation of this company is that the company's market capitalization/ total debt ratio fell drastically post 2009. Nakoda Ltd. has given a consistent score of 3 over the last 6 years. Trident Ltd. has a very low average score of Z, less than 1. The main reasons for such a low score is that Trident has very low EBIT and retained earnings corresponding with a very large asset base, and the company's market capitalization to total debt ratio is also less than the average ratio.

The Table 7 to Table 11 show the detailed working of the Altman's Z Score model. The Table 7 depicts the working capital / total assets ratio. As discussed above, working capital to total assets ratio indicates the relationship between working capital (current assets less current liabilities) and total assets. It also reflects the operational efficiency of the company. A low WC/ total assets ratio indicates the company's inability to meet its current obligations. On the other hand, a very high WC/total assets ratio reflects the company's inefficient use of working capital (the textile industry is working capital intensive).

As can be observed from the Table 7, on an average, over the last 6 years, the working capital/total assets ratio has been increasing, which shows that the companies' working capital position has improved over the years. On an average, the ratio is 31.90%, which shows the moderate use of working capital over the last 6 years. In the case of Indo Rama Synthetics (India) Ltd., this ratio is very less, indicating the firm's inability to meet the current liabilities. The companies like S. Kumars Nationwide Limited, Bombay Rayon Fashions Ltd., Alok Industries Ltd., and Pradip Overseas Ltd. had a comfortable working capital to total assets ratio, which shows that these companies had an adequate working capital cushion. S. Kumars Nationwide Limited and Pradip Overseas Ltd. maintained a low level of current liabilities as compared to the industry average due to which the ratio is high.

The Table 8 shows the retained earnings / total assets ratio of the sample 15 companies. Retained earnings to total assets ratio indicates the extent to which the company's total assets have been financed by retained earnings. A higher ratio indicates that the company's growth in assets have been financed through the company's accumulated profits, which is low risk capital. A low ratio indicates that the company does not have adequate profits that are ploughed back in the business, and the company finances its total assets through debt components instead of

Table 8. Retained Earnings/ Total Assets Ratio

S.No	Name of the company	Mar-06	Mar-07	Mar-08	Mar-09	Mar-10	Mar-11	Mean
1	Aditya Birla Nuvo Ltd.	49.17%	47.46%	46.74%	38.63%	46.04%	50.51%	46.42%
2	Alok Industries Ltd.	24.98%	20.38%	16.45%	20.13%	17.15%	17.47%	19.43%
3	JBF Industries Ltd.	38.59%	30.80%	37.89%	31.17%	30.59%	30.31%	33.23%
4	SRF Ltd.	39.89%	48.71%	48.55%	43.79%	43.70%	50.81%	45.91%
5	Garden Silk Mills Ltd.	28.29%	27.31%	27.50%	27.13%	25.51%	25.71%	26.91%
6	Indo Rama Synthetics (India) Ltd.	21.81%	18.11%	15.93%	16.43%	18.39%	20.61%	18.55%
7	S Kumars Nationwide Limited	-7.54%	13.39%	28.31%	23.76%	22.72%	27.51%	18.02%
8	Arvind Mills Ltd.	35.22%	30.36%	32.72%	24.89%	31.53%	37.13%	31.97%
9	Trident Ltd.	7.03%	7.36%	7.36%	4.96%	5.72%	5.40%	6.31%
10	Bombay Rayon Fashions Ltd.	44.00%	48.30%	44.86%	32.90%	43.36%	43.12%	42.76%
11	Pradip Overseas Ltd.	16.13%	12.18%	17.19%	14.58%	22.23%	22.82%	17.52%
12	Nakoda Ltd.	17.18%	15.90%	14.92%	14.63%	16.30%	19.14%	16.35%
13	Century Enka Ltd.	46.32%	39.78%	39.35%	45.25%	47.73%	49.54%	44.66%
14	Sutlej Textiles Industries Ltd.	20.55%	19.29%	16.70%	13.51%	12.33%	20.20%	17.10%
15	Nahar Spinning Mills Ltd.	57.27%	39.52%	34.07%	38.70%	33.84%	28.83%	38.71%
	Mean	29.26%	27.92%	28.57%	26.03%	27.81%	29.94%	28.26%

Table 9. EBIT/ Total Assets Ratio

S.No	Name of the company	Mar-06	Mar-07	Mar-08	Mar-09	Mar-10	Mar-11	Mean
1	Aditya Birla Nuvo Ltd.	7.87%	8.33%	7.21%	5.08%	6.87%	7.49%	7.14%
2	Alok Industries Ltd.	9.46%	9.83%	9.63%	11.38%	9.45%	11.23%	10.16%
3	JBF Industries Ltd.	11.41%	13.76%	14.90%	9.24%	10.67%	9.26%	11.54%
4	SRF Ltd.	13.89%	28.42%	12.47%	13.56%	18.29%	23.89%	18.42%
5	Garden Silk Mills Ltd.	7.12%	8.93%	13.90%	8.44%	9.77%	10.48%	9.77%
6	Indo Rama Synthetics (India) Ltd.	3.02%	3.90%	-1.77%	3.38%	10.83%	3.84%	3.87%
7	S Kumars Nationwide Limited	10.84%	11.69%	17.67%	8.50%	11.39%	11.94%	12.00%
8	Arvind Mills Ltd.	6.68%	7.56%	5.21%	3.77%	6.37%	7.42%	6.17%
9	Trident Ltd.	4.27%	3.39%	2.67%	-0.11%	3.93%	3.72%	2.98%
10	Bombay Rayon Fashions Ltd.	13.39%	10.18%	16.74%	11.75%	8.08%	7.52%	11.28%
11	Pradip Overseas Ltd.	-0.41%	16.01%	19.51%	15.47%	12.94%	12.53%	12.67%
12	Nakoda Ltd.	7.04%	10.38%	8.65%	8.83%	6.15%	6.43%	7.91%
13	Century Enka Ltd.	3.63%	4.37%	5.13%	5.32%	14.68%	10.03%	7.19%
14	Sutlej Textiles Industries Ltd.	7.08%	8.98%	7.46%	1.23%	10.55%	19.33%	9.10%
15	Nahar Spinning Mills Ltd.	4.45%	8.78%	3.23%	1.02%	7.62%	9.98%	5.85%
	Mean	7.32%	10.30%	9.51%	7.12%	9.84%	10.34%	9.07%

reinvesting profits. As reflected in the Table 8, in our sample of selected companies, over the last 6 years, this ratio (retained earnings / total assets ratio) has remained constant, indicating that the companies in the textile industry over the last 6 years have not ploughed back majority of the profits. The best performing companies in this category are Aditya Birla Nuvo Ltd., Bombay Rayon Fashions Ltd., Century Enka Ltd., and JBF Industries Ltd. with a high average retained earnings to total assets ratio, indicating that these companies had, on an average, 40% of their total assets funded by retained earnings. Trident Ltd. has the least retained earnings to total assets ratio as

Table 10. Market Capitalization/ Total Debt Ratio

S.No	Name of the company	Mar-06	Mar-07	Mar-08	Mar-09	Mar-10	Mar-11	Mean
1	Aditya Birla Nuvo Ltd.	361.39%	571.76%	158.48%	157.87%	172.29%	168.09%	264.98%
2	Alok Industries Ltd.	45.86%	48.48%	5.36%	6.35%	24.31%	13.24%	23.93%
3	JBF Industries Ltd.	120.40%	176.03%	22.37%	55.09%	77.00%	35.04%	80.99%
4	SRF Ltd.	138.11%	163.87%	60.02%	101.79%	151.34%	103.39%	119.75%
5	Garden Silk Mills Ltd.	30.31%	51.36%	15.34%	27.84%	34.82%	11.44%	28.52%
6	Indo Rama Synthetics (India) Ltd.	41.29%	54.11%	13.36%	35.77%	59.92%	28.17%	38.77%
7	S Kumars Nationwide Limited	101.95%	233.68%	39.41%	42.89%	73.77%	21.48%	85.53%
8	Arvind Mills Ltd.	50.81%	79.05%	16.71%	32.22%	69.84%	67.37%	52.67%
9	Trident Ltd.	55.04%	69.75%	9.51%	17.76%	19.61%	9.61%	30.21%
10	Bombay Rayon Fashions Ltd.	886.57%	552.78%	96.01%	70.56%	83.09%	98.38%	297.90%
11	Pradip Overseas Ltd.	30.75%	8.60%	6.66%	19.52%	30.24%	9.85%	17.60%
12	Nakoda Ltd.	65.56%	103.14%	14.08%	38.42%	38.88%	20.50%	46.76%
13	Century Enka Ltd.	94.08%	85.47%	28.40%	216.11%	198.95%	52.51%	112.59%
14	Sutlej Textiles Industries Ltd.	0.30%	33.91%	5.09%	14.57%	37.66%	17.57%	18.18%
15	Nahar Spinning Mills Ltd.	105.88%	57.94%	9.73%	39.79%	45.49%	11.80%	45.10%
	Mean	141.89%	152.66%	33.37%	58.44%	74.48%	44.56%	84.23%

Table 11. Sales/ Total Assets Ratio

S.No	Name of the company	Mar-06	Mar-07	Mar-08	Mar-09	Mar-10	Mar-11	Mean
1	Aditya Birla Nuvo Ltd.	0.638	0.556	0.544	0.529	0.521	0.641	0.57
2	Alok Industries Ltd.	0.571	0.457	0.341	0.450	0.402	0.502	0.45
3	JBF Industries Ltd.	1.292	1.488	1.640	1.378	1.295	1.367	1.41
4	SRF Ltd.	1.080	1.191	0.965	0.775	0.758	1.032	0.97
5	Garden Silk Mills Ltd.	1.005	1.290	1.417	0.947	1.503	1.773	1.32
6	Indo Rama Synthetics (India) Ltd.	0.896	1.043	1.131	1.227	1.235	1.455	1.16
7	S Kumars Nationwide Limited	0.621	0.736	0.943	0.612	0.652	0.664	0.70
8	Arvind Mills Ltd.	0.451	0.497	0.611	0.630	0.616	0.642	0.57
9	Trident Ltd.	0.338	0.299	0.321	0.315	0.371	0.448	0.35
10	Bombay Rayon Fashions Ltd.	0.842	0.563	0.786	0.561	0.390	0.397	0.59
11	Pradip Overseas Ltd.	0.045	1.514	1.623	1.725	1.388	1.530	1.30
12	Nakoda Ltd.	2.139	2.082	2.146	1.913	1.246	1.412	1.82
13	Century Enka Ltd.	1.205	0.983	1.170	1.274	1.159	1.173	1.16
14	Sutlej Textiles Industries Ltd.	0.893	0.967	0.938	1.056	1.069	1.356	1.05
15	Nahar Spinning Mills Ltd.	0.482	0.720	0.616	0.792	0.701	0.619	0.65
	Mean	0.833	0.959	1.013	0.945	0.887	1.001	0.94

the majority of the company's total assets were funded by borrowings, and the company had very low retained earnings as compared to others.

The Table 9 shows EBIT / total assets ratio. This ratio indicates how effectively a company is using its total assets to generate earnings before interest and tax obligations. A higher ratio indicates the operational efficiency of the firm, and a lower ratio means that the company is not effectively using its total assets to generate earnings. As can be inferred from the Table 9, in the sample of the selected companies, Alok Industries Ltd., JBF Industries

Ltd., SRF Ltd., Garden Silk Mills Ltd., S. Kumars Nationwide Limited, Bombay Rayon Fashions Ltd., Pradip Overseas Ltd., and Sutlej Textiles Industries Ltd. have a EBIT / total assets ratio higher than the industry average. Again, Trident Ltd. has the least EBIT/ total assets ratio, the reason being that the company has a very high asset base and a low EBIT. A huge jump in 2010 EBIT from 2009 is because of recovery from recession in the U.S. and depreciation of the rupee. The average EBIT / total assets ratio was the lowest in March 2009. The main reason was volatile input costs due to rising power and fuel prices and the increase in crude oil base raw material cost due to rupee depreciation. However, the depreciation of the Indian rupee against the U.S. dollar and Euro improved the topline of the companies in the industry due to which EBIT has been rising over the last couple of years.

The Table 10 shows the market capitalization / total debt ratio of the selected companies. Market capitalization / total debt ratio measures whether the firm has sufficient net worth to meet the total debt obligations. We can see that this ratio has been constantly falling because of the macroeconomic factors, as this ratio is directly related to the market capitalization which depends on the stock market. As shown in the Table 10, the highest average ratio in this category is of Bombay Rayon Fashions Ltd. followed by Aditya Birla Nuvo Ltd. Aditya Birla Nuvo Ltd. has a very high market capitalization to total book debt ratio because it is an established name and the market leader due to which it enjoys a high market value, hence has a high market capitalization as compared to the peers in the industry. However, in the case of Bombay Rayon Fashions Ltd., the average is the highest, however, this ratio fell after March 2007 due to drop in market value and increasing dependence on debt.

The Table 11 shows the sales to total assets ratio. This ratio measures the effectiveness with which the firm uses its total assets to generate sales. A high ratio indicates efficient utilization of assets, while a low ratio signifies less utilization of assets to generate sales revenue. From the Table 11, we can observe that the sales to total assets ratio is stable with the industry average for every company for each year except for Trident Ltd., which has a very huge asset base. However, the sales have been increasing over the last 6 years. The highest sales/total assets ratio is of Nakoda Ltd. The company's sales are almost twice its total asset base, which reflects effective utilization of its total assets. The sample under study reflects that the assets have been effectively utilized.

Conclusion

Sound financial health is an important prerequisite for survival of a business. Crucial business decisions are taken keeping in mind the financial capability of the firm. It is ,therefore, necessary to select and use optimal tools to analyze and predict financial strength of the firms. Altman Z Score is an effective model which helps in judging the financial position of the firm and predicting bankruptcy. This study was carried out to investigate the financial position of the companies operating in the Indian textile industry. Our study reveals that the selected sample from the Indian textile industry is in the intermediate or 'grey' zone, with the mean value of the Z Score for the last 6 years being 2.52. The study indicates that many textile manufacturers in India are financially unsound.

The average score was lowest in March 2009 followed by March 2008. The main reasons were heavy investments due to government promotion through the TUFs scheme and underutilization of increased capacity coupled with recession. Even the market leaders Aditya Birla Nuvo Ltd. and Bombay Rayon Fashions Ltd. had a negative impact on their balance sheets because of the 2008 financial crisis. Effective measures are the need of the hour to prevent any bankruptcy and for reviving the Indian textile industry.

Limitations of the Study and Research Implications

The major limitation of the study is that it only concentrates on the top 15 companies of the textile industry. The Altman Z Score model is an important tool for credit risk assessment. The findings can be used as a valuable indicator for predicting the bankruptcy of the firms. Banks can use this as an important tool while monitoring the borrower companies, especially during the times of financial crisis. Moreover, various strategies can be devised by the banks once the early signs of bankruptcy are witnessed. From the borrowers' perspective, this empirical

evidence can assist managements to forecast financial distress and enable them to take adequate measures to avoid bankruptcy.

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