International Journal of Education and Research
Vol. 1 No. 1 January 2013

FINANCIAL STATUS OF SELECT SUGAR MANUFACTURING UNITS-Z SCORE MODEL

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ABSTRACT

Financial Distress is a situation where a firm's operating cash flows are insufficient to satisfy current obligations and the firm is forced to take corrective actions. A firm in financial distress may also face bankruptcy or liquidation to meet its liabilities. Financial Distress may be caused by losses and dividend reduction. This paper uses the Altman's Z-score model to predict the risk of financial distress of select sugar manufacturing units in Andhra Pradesh, India. The results clearly indicate that the liquidity, working capital turnover efficiency and solvency position of the companies is not good. The Z-Score analysis also shows the companies are suffering from the financial distress and tending towards bankruptcy.

KEYWORDS: Bankruptcy, Financial distress, Liquidity, Solvency, Altman's Z-score.

INTRODUCTION

Tight cash situation is one in which a business, household, or individual cannot pay the owed amounts on the due date. If prolonged, this situation can force the owing entity into bankruptcy or forced liquidation. It is compounded by the fact that banks and other financial institutions refuse to lend to those in serious distress. When a firm is under financial distress, the situation frequently sharply reduces its market value, suppliers of goods and services usually insist on COD terms, and large customers may cancel their orders in anticipation of not getting deliveries on time.

Financial distress is a stage before bankruptcy where a company's creditors are paid with significant difficulty or not being paid. While a company can avoid moving from financial distress to bankruptcy, it can be very difficult. Often financial distress is indicated by additional costs, such as fees paid to lawyers or the costs of extra interest for late payments.

REVIEW OF LITERATURE

Chen and Shimerda, Dugan and Zavgren(1985), have outlined seven financial factors that can help to predict financial distress: return on investment, financial leverage, capital turnover, short-team liquidity, cash position, inventory turnover and receivables turnover. By using financial ratios, the accuracy of predicting bankruptcy of a firm is greater than ninety percent. The Altman's(1968) model uses various ratios to consider the seven factors noted above. McDonald and Morris(1985) argue that in so far as bankruptcy is due to unforeseeable event and therefore, it cannot be predicted. Gupta (2000) attempted a refinement of Beaver's method with the objective of predicting the business failure. Whereas Mulla(2002) made a study in Textile mill with the help of Z-score model for evaluating the financial health with five weighted financial ratios and followed by Selvam M,et al(2004), which revealed about Cement industry's financial heath with special reference to India Cements Limited. Bagchi(2004)analyzed about practical implication of accounting ratios in risk evaluation and concluded that accounting ratios are still dominant factors in the matter of credit risk evaluation. Chaitanya(2005) used Z-score model to measure the financial fitness of IDBI and concluded that IDBI is likely to become insolvent in the years to come. Chowdhury and Barua(2009)investigate the financial attributes of Z-category companies' shares using Z-score analysis and found that ninety percent of those companies are suffering with financial problem.

NEED OF THE STUDY

All the above reviews show the significance of measurement of financial distress. The present study made an attempt to measure the financial distress along with liquidity, solvency and leverage position of select sugar manufacturing units in the state of Andhra Pradesh in India. Sugar industry is an agro based manufacturing industry. Its contribution is more in country's economic growth and GDP. So the present study is concentrated on financial health of selected sugar manufacturing units in Andhra Pradesh of India.

OBJECTIVES

To analyze the financial performance through liquidity, working capital, investment efficiency and solvency ratios and to measure the financial distress of the select sugar manufacturing units with Altman's Z -score model.

INDIAN SUGAR INDUSTRY

India is the largest consumer and second largest producer of sugar in the world. The Indian sugar industry is second largest agro based industry located in the rural India. The Indian sugar industry has a turnover of Rs. 500 billion per annum and it contributes almost Rs. 22.5 billion to central and state exchange as tax cess and excise duty every year. It is the second largest agro processing industry in the country after cotton textiles. With 453 operating sugar mills in different parts of the country, Indian sugar industry has been a focal point for socio-economic development in the rural areas. The industry not only generates power for its own requirement but surplus power for export to the grid based on byproduct biogases. It also produces ethanol an ecology friendly and renewable energy for blending with petrol.

SOURCE OF DATA

Annual reports of Chittoor Co-operative Sugars Ltd., Prudential Sugar Corporation Ltd., and Sri Venkateswara Co-operative Sugar Factory Ltd., from the years 2004 to 2010 are taken.

LIQUIDITY TEST

Liquidity or short-term solvency is an attribute that signifies the capacity to meet the financial obligation as and when required. The liquidity ratios are used to measure the short-term solvency and indicate the ability of a firm to meet its debt requirements as and when they become due. Current liabilities are used as the denominators of the ratios because they are considered to represent the most urgent debt, requiring retirement within one year or most preciously, within one operating cycle. The available financial resources to satisfy these obligations must come primarily from cash or the conversion of cash of other current assets.

In order to test the liquidity of the company, two most popular ratios, viz., current ratio and quick ratio were calculated and presented in the Table1.

Table 1 : Liquidity Ratios

Year	Chittoor Co-Operative Sugars Ltd.		Prudential Sugar Corporation Ltd.		Sri Venkateswara Co-operative Sugar Factory Ltd.	
	CR	QR	CR	QR	CR	QR
2004	1.25	0.57	1.62	0.42	0.93	0.60
2005	1.35	0.61	1.17	0.34	0.84	0.61
2006	2.10	0.50	2.26	0.66	1.13	0.92
2007	1.42	0.40	2.11	0.65	1.10	1.07
2008	1.74	0.58	1.01	0.45	0.93	0.90
2009	2.30	1.04	1.47	0.32	1.08	1.00
2010	1.55	0.42	1.21	0.29	0.83	0.21

Table 1 shows current ratios and quick ratios from the year 2004 to 2010 for select sugar manufacturing units of the study. Both current ratios and quick ratios for almost all the years are less than the standard norm in the study period (2004 - 2010) for three select sugar manufacturing units of the study, reflecting the poor liquidity position of the companies.

WORKING CAPITAL INVESTMENT EFFICIENCY TEST

In order to substantiate the liquidity test, it is essential to test the working capital investment efficiency test also, because inventory and accounts receivable - the two important constituents of current assets - may sometimes block the proprietor’s funds. A blockage occurs when money becomes tied up in slow paying debtors, or in slow moving stocks. In such a case, the business may appear to have a satisfactory amount of working capital but little or no liquidity. These are the common working capital investment efficiency ratios:

- Inventory Turnover Ratio (ITR)
- Days Sales Outstanding in Inventory (DSOI)
- Debtors Turnover Ratio (DTR)
- Days Sales Outstanding in Debtors (DSOD)

Table 2 represents the working capital investment efficiency ratios of the selected three companies.

Table 2 : Working Capital Investment Efficiency Ratios

Year	Chittoor Co-Operative Sugars Ltd.				Prudential Sugar Corporation Ltd.				Sri Venkateswara Co-operative Sugar Factory Ltd.			
	ITR	DSOI	DTR	DSOD	ITR	DSOI	DTR	DSOD	ITR	DSOI	DTR	DSOD
2004	0.24	540	2.38	153	1.23	296	4.16	81	0.60	608	1.11	328
2005	1.39	263	1.45	253	2.56	143	8.05	45	0.84	436	1.03	354
2006	1.41	259	1.70	214	2.56	142	10.10	36	0.96	381	0.94	388
2007	1.44	253	4.88	75	3.14	116	9.06	40	0.54	676	0.66	553
2008	1.52	240	3.02	121	3.00	122	6.91	53	0.64	570	0.59	619
2009	0.98	371	2.54	144	2.22	163	7.92	46	3.29	111	1.18	309
2010	1.28	286	2.39	155	2.56	143	9.68	38	1.29	285	0.87	420

Chittoor Co-operative Sugars Ltd.

The ITR is increasing from 0.24 to 1.28 and showing fluctuating trend during the study period. There is a gradual increase of the cost of goods sold. It reflects an additional burden on the part of the working capital of the company. The DSOI is 540 days and is very high in the year 2004. It gradually decreased to 286 days during the study period. The overall stock outstanding days are more in the study period. The DTR is fluctuating during the study period and varied from 1.45 to 4.88 indicating the credit sales of the company increased year by year in the study period. The DSOD is 253 days and is high in the year 2005 and it is low (75 days) in the year 2007 and showing fluctuations during the study period, indicating the day's stock outstanding debtors increased year by year in the study period.

Prudential Sugar Corporation Ltd.

The ITR gradually increased from 1.23 to 3.14 during the study period, indicating that there is a gradual increase of the cost of goods sold. It reflects an additional burden on the part of the working capital of the company. The DSOI is 296 days in the year 2004 and it gradually decreased to 143 days during the study period, indicating the day's stock outstanding decreased year by year in the study period. The DTR is 10.10 in the year 2006 and it is high during the study period and varied from 4.16 to 10.10 indicating the credit sales of the company as high in the study period. The DSOD is 81 days and is high in the year 2004 and it decreased to 38 days during the study period, indicating the day's stock outstanding debtors decreased year by year in the study period.

Sri Venkateswara Co-operative Sugar Factory Ltd.

The ITR is fluctuating from 0.60 to 3.29 during the study period indicating that there is a gradual increase of the cost of goods sold. It reflects an additional burden on the part of the working capital of the company. The DSOI is 608 days in the year 2004. It is high (676 days) in the year 2007 and low (111 days) in the year 2009.The DTR is low and varied from 0.66 to 1.18 during the study period indicating the credit sales of the company as high in the study period. The DSOD is 553 days and is high in the year 2007 and it is low (309 days) in the year 2009, showing fluctuating trend during the study period.

SOLVENCY TEST

The detection of a firm's operating and financial difficulties is a subject which has been particularly amenable to analysis with financial ratios. To detect signs of looming bankruptcy, analysts calculate and analyze all kinds of financial ratios, viz., working capital ratios, debt levels, profitability and liquidity. The problem in each ratio is unique and tells a different story about a firm's financial health. Many a time, they even appear to contradict with each other. Having to rely on a bunch of individual ratios, the analysts may find it confusing and difficult to know when a stock is going to the wall.

Table 3 shows the Working Capital to Total Assets ratios, Retained Earnings to Total Assets ratios, EBIT to Total Assets ratios, Equity to Total Assets ratios and Sales to Total Assets ratios of three selected companies of the study.

Table 3 : Solvency Ratios

Year	Chittoor Co-Operative Sugars Ltd.					Prudential Sugar Corporation Ltd.					Sri Venkateswara Co-operative sugar factory Ltd.				
	WC/ TA	RE/ TA	EBIT/ TA	EQ/ TA	SA/ TA	WC/ TA	RE/ TA	EBIT/ TA	EQ/ TA	SA/ TA	WC/ TA	RE/ TA	EBIT/ TA	EQ/ TA	SA/ TA
2004	0.09	0.57	-0.23	0.34	0.32	0.17	0.03	0.05	0.33	0.52	-0.04	0.18	0.30	0.46	0.33
2005	0.12	0.57	-0.13	0.34	0.22	0.05	-0.02	0.01	0.38	0.86	-0.08	0.17	0.32	0.51	0.32
2006	0.34	0.42	-0.06	0.42	0.19	0.25	0.07	0.02	0.40	0.97	0.01	0.27	0.51	0.57	0.33
2007	0.19	0.43	-0.11	0.31	0.58	0.27	0.09	0.17	0.40	1.26	0.02	0.21	0.53	0.59	0.22
2008	0.28	0.42	-0.08	0.34	0.50	0.01	-0.08	0.20	0.53	1.35	0.03	0.25	0.57	0.56	0.21
2009	0.36	0.42	-0.16	0.43	0.49	0.18	-0.08	0.09	0.49	0.87	0.02	0.26	0.53	0.60	0.59
2010	0.22	0.47	0.02	0.52	0.55	0.12	-0.10	0.10	0.53	1.36	0.11	0.23	0.54	0.54	0.35

Chittoor Co-operative Sugars Ltd.

The ratio of working capital to total assets of the company is varied from 0.09 to 0.36 during the study period, showing inefficient mobilization of working capital. The ratio of retained earnings to total assets is varied from 0.42 to 0.57 during the study period, indicating that the retained earnings mobilization is low. The ratio of EBIT to total assets is negative in all the years of study except for the year 2010, indicating that the operating profit of the company is negative, i.e., the company is not in a position to meet the financial obligations like interest and tax payments of the company. The portion of Equity to Total Assets is also low and varied from 0.31 to 0.52 during the study period. It shows the interest of shareholders is low due to financial ill health of the company. The sales to total assets ratio is varied from 0.19 to 0.58 during the study period indicating that the sales of the company is low compared to total assets invested by the company. Overall, the solvency position of the company is not good.

Prudential Sugar Corporation Ltd.

The ratio of working capital to total assets of the company is varied from 0.01 to 0.27 during the study period, showing inefficient mobilization of working capital. The ratio of retained earnings to total assets is negative in the years 2005, 2008, 2009 and 2010 because of the earning of the company is negative. The ratio of EBIT to total assets is positive and low and varied from 0.01 to 0.20 shows that the earnings of the company is low. The ratio of equity to total assets is also low and varied from 0.33 to 0.53 during the study period. It shows that the interest of shareholders is low due to financial ill health of the company. The sales to total assets ratio is varied from 0.52 to 1.36 during the study period indicating that the sales of the company is low compared to total assets invested by the company. Overall, the solvency position of the company is not poor.

Sri Venkateswara Co-operative Sugar Factory Ltd.

The ratio of working capital to total assets of the company is negative in the year 2004-05 and varied from -0.08 to 0.11 during the study period, showing inefficient mobilization of working capital. The ratio of retained earnings to total assets is positive and increasing from 0.17 to 0.24 in the study period indicating the retained earnings of the company increased year by year. This reflects the less interest shown by the shareholders of the company due to financial ill health. The ratio of EBIT is positive and low and increasing from 0.20 to 0.54 during the study period. The ratio of equity to total assets is low and increasing and varied from 0.46 to 0.60 during the study period. It shows that the interest of shareholders increased year by year. The sales to total assets ratio is varied from 0.21 to 0.59 during the study period indicating that the sales of the company is low to compare total assets invested by the company. Overall the solvency position of the company is not satisfactory.

Z-SCORE ANALYSIS

To test the financial health of the selected companies of the study, we considered Edward Altman's[1] Multiple Discriminant Analysis. The Z-Score formula is a measurement of the financial health of company and is a powerful diagnostic tool that forecasts the probability of a company entering bankruptcy.

$$\sum_{i=1}^{n} Z_i = 0.717 x_{1i} + 0.847 x_{2i} + 3.107 x_{3i} + 0.42 x_{4i} + 0.998 x_{5i}$$

where i = year 1 to n

X_1 = Networking capital to total assets ratio X_2

= Retained Earnings to total assets ratio X_3 =

EBIT to total assets ratio

X_4 = Capital funds to total liabilities ratio

X_5 = net sales to total assets ratio

Test Results

$Z < 1.21$ indicates bad financial performance leads to bankruptcy. Z

≥ 1.21 and $Z \leq 2.9$ indicates poor financial performance.

$Z > 2.9$ indicates good financial performance.

Table 4 represents the trend of Z-score values for the select companies from the year 2004 to 2010.

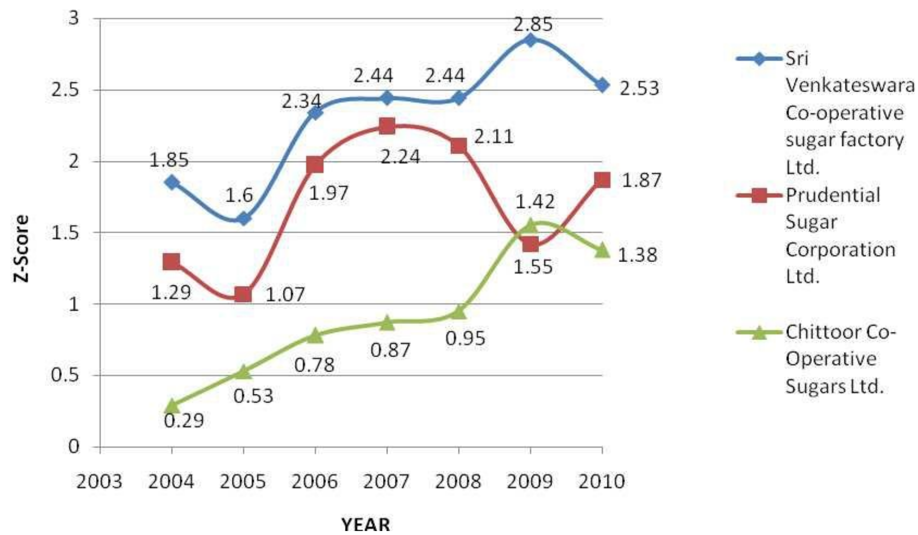
Table 4 : Z-Score Values

Year	**Chittoor Co-Operative Sugars Ltd.**	**Prudential Sugar Corporation Ltd.**	**Sri Venkateswara Co-operative Sugar Factory Ltd.**
2004	0.29	1.29	1.85
2005	0.53	1.07	1.6
2006	0.78	1.97	2.34
2007	0.87	2.24	2.44
2008	0.95	2.11	2.44
2009	1.55	1.42	2.85
2010	1.38	1.87	2.53

The Z-score analysis was applied to evaluate the general trend in the financial health of Chittoor Co-Operative Sugars Ltd., Prudential Sugar Corporation Ltd., and Sri Venkateswara Co-operative sugar factory Ltd. by using solvency ratios.

The Z-score of Chittoor Co-Operative Sugars Ltd.,is less than 2.9 during the study period, indicative of poor financial performance leading to bankruptcy. However, the Z-score increased from 0.29 to 1.55 during the study period 2004 to 2010, indicating the company came to know the financial performance and taken turnaround measures to improve its performance. The Z-score of Prudential Sugar Corporation Ltd. is showing increasing trend up to 2007 from 2004. Later, the Z-scores experienced downward trend up to the year 2010. The Z-scores are more than 1.21 and below 2.9 during the study period indicative of poor financial performance of the company. The Z-scores of Sri Venkateswara Co-operative sugar factory Ltd. also increased from 1.85 to 2.53 during the study period 2004 - 2010. The scores are more than 1.21 and less than 2.9 indicative of poor financial performance of the company.

Figure 1 : Z-Score chart



CONCLUSIONS

The sugar industry is an agro-based manufacturing industry. Its financial performance not only depends on its financial activity but also on climatic conditions and yield of sugarcane. From the analysis, it is clear that the liquidity, working capital turnover efficiency and solvency position of the Chittoor Co-Operative Sugars Ltd., Prudential Sugar Corporation Ltd., and Sri Venkateswara Co-operative Sugar Factory Ltd., is not good. The Z-score analysis shows the poor financial performance leading to bankruptcy of Chittoor co-operative sugars Ltd. However, the Z-score was in increasing trend from the year 2004 to 2010 indicating the company became aware of the financial performance and taken corrective measures to increase its financial performance. Comparatively the financial performance of Sri Venkateswara Sugars Factory Ltd. performance is good. All the three companies are facing financial distress. Therefore, it requires an all-round and valiant effort of all the people involved in it - managers, employees and other stakeholders. Especially, when the firm's financial position is tending towards bankruptcy, the turnaround is like an adventurous journey.

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