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Management

EVALUATING FINANCIAL HEALTH OF GUJARAT STATE FERTILIZERS THROUGH 'Z' SCORE MODEL

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Abstract

The evaluation of financial health is very useful for financial managers, investors and other users. In this study it is tried to know whether Z score model is able to evaluate financial health of Chambal Fertilizers and Chemicals ltd for past 10 years (2007-08 to 2016-17). Analysis of this paper shows that the model is useful to know the financial soundness of Chambal Fertilizers. In this paper overall results of Z score model indicating that the financial position of the corporation is on alert to exercise the caution. These result shows that Altman model can give good analysis for fertilizers sector in India. Hence it can be concluded that user of financial statements like financial managers, analysts, investors etc can predict business failure or financial soundness of companies through Altman Z score model.

Keywords: Financial Health; Fertilizers; Z-Score Model.

1. Introduction

During the recent period of economic and business every corporate is striving hard to survive in this growing era of core competence. In order to survive and continue to be in business it is essential that a corporate successfully manages its finance health which requires more attention and care. The important factor causing business failure is ineffective financial management. The prediction and prevention of financial distress is one of the major factors, which will help to avoid bankruptcy. A company's chances of survival can be predicted with the use of financial-statement analysis. One of the most commonly used statistical ratio models for predicting business collapse is Altman's Z score. This model has proven to be a reliable tool for bankruptcy forecasting in a wide variety of contexts and markets. The modal is both popular and widely used in the fields of credit risk analysis, distressed investing; M&A target analysis, and turnaround management. It incorporates five weighted financial ratios into the calculations of the Z-Score. However, it should be noted that the Z score does not apply to every situation. It can only be used for forecasting if the company being analyzed can be compared to the database. In this paper, an attempt has been

made to use Edward Altman's Z score to have an insight into the examination of financial health of selected private sector company of India.

2. Review of Literature

The multiple discriminate analysis [MDS] was used by Altman in his effort to find out a bankruptcy prediction model. Between 1946 and 1965 he selected 33 publicly traded manufacturing bankrupt companies and matched them to 33 firms on a random basis. The result yielded equations called 'Z' score that correctly classified 94% of the bankrupt companies and 97% of the non-bankrupt companies a year prior to bankruptcy. This percentage dropped when trying to predict bankruptcy two or more years before it occurred. The ratios used in Altman model are working capital over total assets, retained earnings over total assets, earnings before interest and taxes over total assets market, value of the equity over book value of total liabilities and sales over total assets.

Gupta attempted a refinement of Beavers method with the objective of building a forewarning system of corporate sickness the study among 728 industries revealed that earnings before depreciation, interest and taxes to taxes and operating cash flows to sales had higher degree of sickness. In accordance with the literature, the liquidity and profitability ratios turned out to be the most important variable in forecasting default followed by the company size and its activity. Zulkarnian(2006) analyzed the corporate financial distress among Malaysian listed firms during Asian financial crisis.Ugurlu and Hakan(2006) conducted a research to predict corporate financial distress for the manufacturing companies listed in Istanbul stock exchange for the period, 1996-2003. Chiung-Ying Lee and Chia-Hua Chang (2010) analyzed the financial health of public companies listed in Taiwanese stock exchange using Logistic Regression model of early warning prediction.

There are also a number of careful research studies using data from United States firms that provide various methods to identify failing firms. After the establishment of Altman's Z score model, abundant studies have done further research on the z score model, including Deakin (1972), Taffler (1983), Goudie (1987), Agarwal and Taffler (2007), Sandin and Porporato (2007). Many studies also have been done relevant to the Ohlson model, including Lau (1987), Muller, Steyn-Bruwer, and Hamman (2009).

3. Methodology

The study has been confined to only select private sector Company named Gujarat Fertilizers and Chemicals Ltd. It confines itself to issues relating to the financial performance only.

3.1. Objectives of the Study

The objectives of the study are as follows
    1) To examine the overall financial performance of the company in past 10 years.
    2) To estimate likelihood of bankruptcy of the company.
    3) To examine the relationship of z value and among its five ratios consisted in model.
    4) To analyze customer's creditworthiness by applying Z score model.

3.2. Hypotheses of the Study

1) Null Hypothesis: The relationship between market value of equity and book value of total debt of this company is not significant.
   Alternative Hypothesis: The relationship between market value of equity and book value of total debt of this company is significant.
2) Null Hypothesis: The relationship between sales and total assets of this company is not significant.
   Alternative Hypothesis: The relationship between sales and total assets of this company is significant.

4. Data Collection and Research Sample

A moderately lengthy period was deemed necessary to arrive at meaningful and purposeful inferences. A ten year period beginning at 2007-08 and ending with 2016-17 was adopted for the present study. The data has been collected from the secondary sources comprises of published annual reports, various journals and information from the related websites. The collected data was classified, tabulated and analyzed in a systematic manner. The data was analyzed with the help of ratio analysis. The Edward Altman's 'Z' score analysis has been adopted to monitor the financial health of the company to predict as well as to avoid business failure and subsequent bankruptcy. In addition to that, the study used statistical tools like mean, standard deviation, correlation and 't' test.

5. The Model: Altman 'Z'-Score

The Z-score formula for predicting bankruptcy was published in 1968 by Edward I. Altman, Professor of Finance at New York University School of Business. This model has proven to be a reliable tool for bankruptcy forecasting in a wide variety of contexts and markets. Z-scores are used to predict corporate defaults and an easy-to-calculate control measure for the financial distress status of companies in academic studies. The Z-score uses multiple corporate income and balance sheet values to measure the financial health of a company. The model incorporates five weighted financial ratios into the calculations of the Z-Score. Professor Altman continues to update the model's coefficients to reflect changing ways of conducting business. Prof. Altman has defined 5 variables that comprise the Z-score for public and private companies.

Altman 'Z' Score Bankruptcy Model for Private Companies (manufacturing)

$Z = T1*0.717 + T2*0.847 + T3*3.107 + T4*0.420 + T5*0.998$
Where:
T1 = Working Capital / Total Assets (WC/TA)
T2 = Retained Earnings / Total Assets (RE/TA)
T3 = Earnings before Interest and Taxes / Total Assets (EBIT/TA)
T4 = Market Value of Equity / Total Liabilities (MVE/TL)
T5 = Total Sales / Total Assets (TS/TA)

1) **T₁ (Working Capital / Total Assets):** The ratio of Working Capital to Total Assets is the Z-Score component which is considered to be a reasonable predictor of deepening trouble for a company. A company which experiences repeated operating losses generally will suffer a reduction in working capital relative to its total assets.

2) **T₂ (Retained Earnings/Total Assets):** The ratio of Retained Earnings to Total Assets is a Z-Score component which provides information on the extent to which a company has been able to reinvest its earnings in itself. An older company will have had more time to accumulate earnings so this measurement tends to create a positive bias towards older companies.

3) **T₃ (Earnings Before Interest and Taxes /Total Assets):** This ratio adjusts a company's earnings for varying income tax factors and makes adjustments for leveraging due to borrowings. These adjustments allow more effective measurements of the company's utilization of its assets.

4) **T₄ (Market Value of Equity/Total Liabilities):** This ratio gives an indication of how much a company's assets can decline in value before debts may exceed assets. Equity consists of the market value of all outstanding common and preferred stock. For a private company the book value of equity is used for this ratio. This depends on the assumption that a private company records its assets at market value.

5) **T₅ (Net Sales/Total Assets):** This ratio measures the ability of the company's assets to generate sales. This ratio is not included in the Z-Score of a private non-manufacturing company.

Zones of Discrimination:
The resulting Z-score puts a company in one of three zones:-
$Z > 2.90$ -"Safe" Zone
$1.23 < Z < 2.90$ -"Grey" Zone
$Z < 1.23$ -"Distress" Zone

6. Profile of the Gujarat Fertilizers

GSFC was incorporated in 1962 and its plants went into production of fertilizers in 1967. In its very first decade of existence, GSFC became known for its path-breaking achievements, to name a few, it was the first industrial complex in the country set up in joint sector, first company to set up fertilizer plants within a short span of two years of getting requisite approvals, it was the first industrial project to secure direct and active equity participation of farmers, the first fertilizer unit to get assistance from IDBI's Assistance Fund, and the first Company to adopt the Steam Naphtha Reforming process for manufacture of Ammonia. GSFC was the first Company in India to establish a Caprolactam plant in the year 1974. This was the apt time when Caprolactam was in great demand mainly for the manufacture of downstream products like nylon yarn, tyre cord etc. As a way forward, it led to expansion into Nylon-6 production. GSFC was also the first to recover Argon gas from purge gas, thus entering into the foray of industrial gases by making Argon gas which is prominently used in welding and this was done way back in the year 1981.

GSFC is focused on developing solutions for sustainable agriculture & industrial growth, through environmentally safe manufacturing processes, delivering good returns to society at large. GSFC is not only a star performer in Gujarat's industrial horizon but has also emerged as a model for

long term value creation. It is in the forefront of assisting farmers to adopt climate smart farming operations through its products and services. Its industrial solutions drive nation's industrial growth while its best practices have set industry standards. Its corporate citizenship with its strong emphasis on achieving inclusive growth is extremely commendable.

7. Findings

Table 1: Various ratios and Altman's Z score for Gujarat Fertilizers

	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
T1= WC/TA	0.27	0.17	0.34	0.33	0.27	0.24	0.24	0.27	0.24	0.20
T2= RE/TA	0.47	0.56	0.54	0.65	0.62	0.56	0.63	0.67	0.61	0.72
T3= EBIT/TA	0.14	0.23	0.11	0.26	0.20	0.11	0.08	0.09	0.08	0.05
T4= Equity/Debt	0.05	0.06	0.05	0.06	0.04	0.03	0.03	0.04	0.03	0.03
T5= NS/TA	1.19	1.77	1.06	1.12	0.95	0.90	0.83	0.97	0.81	0.58
Z-SCORE	**2.22**	**3.11**	**2.13**	**2.74**	**2.31**	**1.91**	**1.81**	**2.55**	**2.22**	**2.01**

Interpretation

The ratio of working capital to total assets of the Gujarat Fertilizers is positive in the study period, which shows that company having moderate investment. Moderate level of fluctuation indicates that the company has a sufficient level of investment in current assets. It does not block the funds in the form of current assets. The ratio of retained earnings to total assets of the company is positive in the study period, indicating the retained earnings of the company increased year by year. The ratio EBIT to total assets shows that The Company registered highest earnings in the year 2010-11 and lowest in the year 2016-17, it means that the company is not in a position to meet the financial obligations like interest and tax payments of the company. From the analysis, it can be concluded that Gujarat chemicals is relying more on debt rather than equity and slowly it is increasing the component of equity equal to debt. The sales to total assets ratio of the Gujarat fertilizers is indicating that the sales of the company are high to compare total assets invested by the company.

8. Discussions

The 'Z' score values of the Gujarat fertilizers during the study period under review have been depicted in the table I. It is understood from the table that during the years 2008-09 the company registered the score much above the safe zone value of financial health. The table also revealed that during the year 2007-08, and 2009-10 to 2016-17, the score was less than 2.90 indicating that the financial position of the corporation is on alert to exercise the caution. The financial health has decreased from the year 2010-11 to 2013-14, but it was above distress zone, which suggested that the corporation is financially safe or the financial health of the company in the future years, is expected to be sound enough to maintain liquidity.

9. Conclusions

This study evaluated financial health of Chambal Fertilizers and Chemicals Ltd through Altman's Z score model. The study covers 10 years of time frame from 2008 to 2017. According to findings the company belongs to grey zone except the year 2008-09, which clearly indicates that the financial position of the corporation is on alert to exercise the caution. This result will provide a warning signal to both internal and external users of financial statement in planning, controlling and decision making. The warning signs and Z score model have the ability to assist management for predicting corporate problems early enough to avoid financial difficulties.

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