



FINANCIAL SOUNDNESS OF AGRI BASED INDUSTRY USING ALTMAN Z SCORE

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Abstract

The Altman Z-score was established by Edward I. Altman (1968) for discriminate analysis to predict bankruptcy or financial strength or financial distress of any Industry or company. While the model was originally developed from samples of publicly traded manufacturing companies; it is also widely used in private manufacturing, non-manufacturing and service companies. The Altman Z-score is based on five financial ratios weighted by coefficients. In this study the Altman Z-score was used to study about the publicly traded Agri based manufacturing company to assess the financial soundness or efficiency. For this study ten Agri based companies, which is Indexed and publicly traded has chosen. The study found that most of the firms financially stable and the general public can invest and they could be benefited out of this firms. Three of the selected firms has fall under distressed that is $Z < 1.81$ - "Distress" Zones, four of them are in grey area that is $1.81 < Z < 2.99$ - "Grey" Zones they fall under this category and rest of the three has under strong in in their financial soundness that is $Z > 2.99$ - "Safe" Zones.

Key Words: Financial distress, Financial Soundness, Alman Z Score, Agri Industry.

Introduction

The Altman Z-score was formulated by Edward I. Altman in the year 1968. The formula will predict the firm's financial soundness or the firm go by bankruptcy in two years. It also predicts the corporate defaults and an easy-to-calculate control measure for the financial distress status of companies. The Z-score uses multiple corporate income and balance sheet values to measure the financial health of a company.

Altman's work built upon research by accounting researcher William Beaver and others. In the 1930s and on, Mervyn and others had collected matched samples and assessed that various accounting ratios appeared to be valuable in predicting bankruptcy. Altman's Z-score is a customized version of the discriminant analysis technique of R. A. Fisher (1936).

William Beaver's work, published in 1966 and 1968, was the first to apply a statistical method, t-tests to predict bankruptcy for a pair-matched sample of firms. Beaver applied this method to evaluate the importance of each of several accounting ratios based on univariate analysis, using each accounting ratio one at a time. Altman's primary improvement was to apply a statistical method, discriminant analysis, which could take into account multiple variables simultaneously.

Agricultural is the backbone of India. It also provides workforce for the 50% of people across the country in the entire population. Most of the agricultural products were convertible into finished goods. The 6% of agricultural production is converted in to processed food, which is focused to achieve 20% in near future. The business is work escalated and contributes around 50% for industrial production. Multi-National Food Companies have assumed a part of making business sector draw and rivalry. Selection of inventive and experimental bundling strategies by food industry has empowered the assembling of sheltered and quality sustenance.

Review of literature

M.R. Ali, M.M. Rahman and M.S. Mahmud (2016), In their study 18 companies of the textile industry in Bangladesh have been selected for calculating financial distress of textile firms. For this the secondary data from the annual report of these companies have been taken to calculate the relevant ratios of the Z-score model. The study has found that 28% companies of the sample industry have fall on "save" zone means shareholders of these companies are save and investor can invest in this companies as these companies are financially sound. But 22%



companies of the sample industry have fall on “grey” zone means these companies have good chance of being financially distress within the next two years of operation. Again, 50% companies of the sample industry have fall on “distress” zone. But the average Z-score of the textile industry in Bangladesh has fall on “grey” zone. So, overall financial soundness of the textile industry in Bangladesh is not satisfactory.

SetyaniDwi Lestari, Retno Fuji Oktaviani, Willy Arafah (2016), their study aimed to obtain empirical evidence about the state of financial distress prediction using the Altman Z-score and ratio-ratio test Z-score in influencing the price of shares in the chemical subsectors listed in Indonesia Stock Exchange 2009-2014 period. The samples were determined by purposive sampling, while data processing using Microsoft Excel, and SPSS. Financial distress only occurs in ETWA company in 2014 in the category of bankruptcy. They found that the effect of a Z-score to the stock price is significantly 0.004 and ratio-ratio of the Altman Z score is working capital to total assets have no significant effect amounted to 0,085, retained earnings to total assets have no significant effect amounted to 0,478, EBIT to total assets have a significant influence amounted to 0,016, and the book value of equity to book value of total debt had no significant effect of 0.078. Contribution ratio-ratio Altman Z-score of 48.6% to the stock price.

GalinomaLubawa& Paul Louangrath (2016), examine financial statements from 102 SME firms with multiple loans in order to verify whether multiple loans significantly affect financial health of SMEs. These SMEs are drawn from Iringa, Tanzania. The methodology employed in this research relies on parametric and nonparametric tests. The Altman Z-test for firm’s financial distress was used as the standard tool to assess SMEs financial performance. Other methods, such as Springate modified Z, Fulmer Fscore and Legault CA-score were employed as comparative measures. The finding shows that multiple borrowing had significantly moved a number of firms from Altman’s “safe zone” to the “gray zone”; however the effect size under Cohen’s d is 0.49.

VaivaKiaupaite and Grushniene (2016), The purpose of their paper is to apply Altman’s Z-score model for bankruptcy prediction on the three listed Lithuanian agricultural companies. Agribusiness is an important industry in Lithuania and recent trends of consolidation and long-term government subsidies make evaluation of financial health of such companies important not only for the owners, but for the other stakeholders as well. The study has found that the model correctly places companies into “safe” and “grey” zones, which gives initial information for the stakeholders.

SahalaManalu, Rony Joyo Negoro Octavianus, GaluhSafarina Sari Kalmadara (2017), the main aim of their study is to analyse financial distress of the shipping company which is listed in Indonesia, The data are analysed using Altman and Zmijewski method. The result indicates that out of four service companies: PT. MBSS is the most financially stable company, while PT. BLT is the company with the worst condition of financial distress condition. The use of both methods also produces results which are not different; what is different is only in terms of the assessment standards. It is advisable to predict financial distress in shipping companies using more than one method for every method employs different standard just to confirm the result.

Research Methodology

The main of the study about the financial soundness of the agri based industries that is listed in the Index. To find the financial soundness Altman Z-Score has been used. Ten agri firms has been used for the study they are Bombay Burmah (BB), Kaveri Seed (KS), Nath Bio-Genes (NBG), Goodricke Group (GG), JK Agri Genetic (JKAG), Harrisons Malay (HM), Dhunseri Tea (DT), Joonktollee Tea (JT), Transchem(TS) and Diana Tea (DT).

Z-score formula was as follows:

$$Z = 1.2X_1 + 1.4X_2 + 3.3X_3 + 0.6X_4 + 1.0X_5.$$

X_1 = working capital / total assets.

X_2 = retained earnings / total assets.

X_3 = earnings before interest and taxes / total assets.



X_4 = market value of equity / book value of total liabilities.

X_5 = sales / total assets.

Altman found that the ratio profile for the bankrupt group fell at -0.25 avg, and for the non-bankrupt group at $+4.48$ avg.

Analysis and Interpretation

Table 1

Name of the Company	X1	X2	X3	X4	X5
BB	0.138	0.862	0.026	1.000	0.367
KS	0.158	0.986	0.224	0.459	0.758
NBG	0.442	0.864	0.069	0.829	0.409
GG	0.012	0.802	0.077	0.601	2.108
JKAG	0.634	0.604	0.039	0.679	1.341
HM	-0.423	0.328	-0.137	0.400	1.925
DT	-0.016	0.937	0.016	0.351	0.282
JT	-0.073	0.761	-0.070	0.753	0.511
TS	0.432	0.678	0.064	0.632	0.000
DT	-0.045	0.676	-0.019	0.199	0.803

Table 1 reference to the score of each firm with reference to Measures liquid assets in relation to the size of the company (X1), Measures operating efficiency (X2), Measures operating efficiency apart from tax and leveraging factors. It recognizes operating earnings as being important to long-term viability (X3), Adds market dimension that can show up security price fluctuation as a possible red flag (X4) and Standard measure for total asset turnover (varies greatly from industry to industry) (X5).

Table 2

Name of the Company	X1
BB	0.138
KS	0.158
NBG	0.442
GG	0.012
JKAG	0.634
HM	-0.423
DT	-0.016
JT	-0.073
TS	0.432
DT	-0.045

Table 2 refer the how the working capital is depends on the asset of the each firm. It shows the number of times short-term liabilities are covered by cash. If the value is greater than 1.00, it means fully covered. The ratio which is generally found in studies of corporate problems is the working capital/total assets ratio. Where, working capital means difference between current assets and current liabilities. Actually, WC/TA is a measure of the net liquid assets of the firm relative to the total capitalization. Among the three liquidity ratios (current ratio and the quick ratio) this one proved to be the most valuable. Ordinarily, a firm having smaller current assets in relation to total assets experiences consistent operating losses. Each company's liquidity ratio and average liquidity ratio of the industry show that the companies' liquidity ratio is not enough to meet the short term liabilities. Because it is



known that the standard value of liquidity ratio is 1:1. If the value is greater than 1.00, it means that the company has the ability to pay short term creditor. Here JKAG has its maximum utilization of working capital over the assets with 0.634 followed by TS with 0.432 and the least one was HM with -0.423.

Table 3

Name of the Company	X2
BB	0.862
KS	0.986
NBG	0.864
GG	0.802
JKAG	0.604
HM	0.328
DT	0.937
JT	0.761
TS	0.678
DT	0.676

Table 3 inputs the measures a company's ability to generate earnings relative to total assets. This ratio highlights how effectively the profitability of a company is being managed. The total amount of reinvested earnings and/or losses of a firm over its entire life is retained earnings. The account is also referred to as earned surplus. It measures of cumulative profitability over time. The age of a firm is implicitly considered in this ratio. Here the KS earned has the maximum of earning in relative to the total assets with the ratio of 0.986 followed by NBG 0.864.

Table 4

Name of the Company	X3
BB	0.026
KS	0.224
NBG	0.069
GG	0.077
JKAG	0.039
HM	-0.137
DT	0.016
JT	-0.070
TS	0.064
DT	-0.019

Table 4 depicts the measure of productivity of the firm's assets before tax and/or leverage factors. Actually firm's existence depends on the earning power of its assets, this ratio is used for studies dealing with corporate failure. Insolvency occurs when the total liabilities exceed the value of the firm's assets with value determined by the earning power of the assets. This ratio continually outperforms other profitability measures, including cash flow. Here the KS has the 0.224 followed by GG with 0.077.



Table 5

Name of the Company	X4
BB	1.000
KS	0.459
NBG	0.829
GG	0.601
JKAG	0.679
HM	0.400
DT	0.351
JT	0.753
TS	0.632
DT	0.199

Table 5 It shows how much the firm's assets can decline in value (measured by market value of equity plus debt) before the liabilities exceed the assets and the firm becomes insolvent. This ratio adds a market value dimension. Where, the market value of equity means market value of all of a company's outstanding shares. Here has its own market value as 1.00 followed by JBG with 0.829.

Table 6

Name of the Company	X5
BB	0.367
KS	0.758
NBG	0.409
GG	2.108
JKAG	1.341
HM	1.925
DT	0.282
JT	0.511
TS	0.000
DT	0.803

Table 6 It is one measure of management's capacity in dealing with competitive conditions. The higher the number is the better. It also indicates that the companies with low profit margins tend to have high asset turnover, while those with high profit margins have low asset turnover. Here GG stands with 2.108 followed by HM with 1.925.

Table 7

Name of the Company	Z Score
BB	2.427
KS	3.340
NBG	2.874
GG	3.862
JKAG	3.484
HM	1.665
DT	1.838
JT	1.711
TS	2.058
DT	1.752

Table 8

Name of the Company	Z Score	Z < 1.81	1.81 < Z < 2.99	Z > 2.99
BB	2.427		★	
KS	3.340			★
NBG	2.874		★	
GG	3.862			★
JKAG	3.484			★
HM	1.665	★		
DT	1.838		★	
JT	1.711	★		
TS	2.058		★	
DT	1.752	★		

Table 7 and 8 shows the Z score value of each firm and it helps the company to analyse whether the company will go for bankruptcy in two years or the company is financially sounds good. Here if the $Z > 2.99$ -“Safe” Zones, $1.81 < Z < 2.99$ -“Grey” Zones, $Z < 1.81$ -“Distress” Zones. By this among the selected firms three firms are in safe zone, four firms in Grey are and three in Distress zone. So the three companies should concentrate in their financial so that their reputation may not affect.

Conclusion

As per the calculation the all the variables should be positive in order to have a higher Z-score. As a result, the companies will be saved from the financial distress. The investors should invest in the KS, GG, JKAG companies are considered ‘Safe’ based on the financial figures. The study is conducted only on the basis of secondary data due to the time and budget constrain. The researcher suggests to collect the primary data from the shareholder and experts of this field to assess the actual and complete scenery regarding the study topic.

Reference

1. Madhusudhan.L (2015), “Agriculture Role on Indian Economy”, Business and Economics Journal, ISSN: 2151-6219, Volume 6, Issue 4. <https://www.hilarispublisher.com/open-access/agriculture-role-on-indian-economy-2151-6219-1000176.pdf>
2. M.R.Ali, M.M. Rahman and M.S. Mahmud (2016), “Financial Soundness of Textile Industry: Altman Z-Score Measurement”, Journal of Science and Technology 14(June 2016): 8-17.
3. Lubawa, G. & Louangrath, P. (2016). “Using Altman Z-Score to Assess the Financial Effects of Multiple Loans on SMEs.” Inter. J. Res. Methodol. Soc. Sci., Vol. 2, No. 1: pp. 63-86. (Jan. – Mar. 2016).
4. SahalaManalu, Rony Joyo Negoro Octavianus, GaluhSafarina Sari Kalmadara (2017), “Financial Distress Analysis with Altman Z-Score Approach and Zmijewski X-Score on Shipping Service Company”, Journal of Applied Management (JAM) Volume 15 Number 4, December 2017.
5. SetyaniDwi Lestari, Retno Fuji Oktaviani, Willy Arafah (2016), “Financial Distress Prediction With Altman Z-Score and Effect On Stock Price: Empirical Study On Companies Subsectors Chemical Listed In Indonesia Stock Exchange Period 2009-2014”, International Journal of Business and Management Invention ISSN (Online): 2319 –8028, ISSN (Print): 2319 –801Xwww.ijbmi.org, Volume 5 Issue 8, August. 2016, PP—30-39.
6. VaivaKiaupaite and Grushniene (2016), “Altman Z-Score Model for Bankruptcy Forecasting of The Listed Lithuanian Agricultural Companies”, 5th International Conference on Accounting, Auditing, and Taxation (ICAAT 2016) pp 220-234.
7. https://en.wikipedia.org/wiki/Altman_Z-score.