Financial Distress Estimation for Bangladeshi Banking Sector: A Study on Publicly Listed Banks

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Abstract

Banking industry is said to be one of the most successful industries in the economy of Bangladesh. Financial distress is the technical term which is used to measure the insolvency that may lead to bankruptcy of organization. The aim of this study is to check the financial health of the banking industry of Bangladesh through application of Altman (1968) Z-score model that predicts the chances of bankruptcy, a similar work done by Mostofa et al. (2016). This paper provides the Z-score value of 29 listed public limited banks and the outcome is however not in harmony with the result of the previous study. As opposed to the earlier study, the Z-scores found based on the information from the most recent financial reports of these banks are found to be low, showing a poor and fragile health of the industry that may lead to bankruptcy of these banks. Multiple financial ratios were used as variables that indicate various aspects of the financial health of the industry and proves that the level of financial distress has only got worse with every passing year.

Keywords: Financial Distress, Financial Analysis, Altman Z-Score, Banking Industry, Bankruptcy.

1. Introduction

A strong financial market is a precondition for development of any economy. Financial market is basically split into two sectors - money market and capital market. Money market is mostly represented by the banking sector (in terms of value of assets) of the economy (Saunders & Cornett, 2012, p. 346). A bank is a financial institution that operates to earn profit by collecting money as deposits from a party of customers and then lending them as loans to others along with various other financial activities. The aim of a banking business, like any other business, is to maximize the wealth of shareholders while ensuring sustainability (Hamilton and Nickerson, 2003). Bank profitability, among any other type of financial institutions, have played a vital role in the growth of any economy over recent years (Klein & Weill, 2018).

Investigators tend to believe that firms that are performing well in terms of profitability are to be considered as good banks with probable sustainability. Gandhi et al. (2019) found that in recent times, most of the practitioners, financial analysts and banking regulators have been using established finance and accounting literature (Altman [1968], Beaver [1966], Libby [1975], Ohlson [1980]) either to calculate financial ratios from annual reports or CAMELS (capital adequacy, asset quality, management quality, earnings, liquidity, and sensitivity to market risk) ratings as early signals to measure bank distress and bankruptcy. According to Joshi, P. D. (2019) bankruptcy is the legal situation of an entity that is unable to repay the debt to the lenders, and where the firm's total liabilities exceed total assets.

According to Modigliani and Miller (1958) the financial status of a firm is irrelevant in real investment decisions in a world of perfect and complete capital markets. However, that does not work in the real world as investors consider multiple financial and psychological factors before making any investment decisions. Aren and Aydemir (2015) found that many investors think that businesses with better corporate reputation would become good investment opportunity and produce higher investment returns. Some also tend to consider firms' social responsibility and environmental control level while making investment decisions. Apart from profit on deposits, investors primarily focus on religious values (mostly Islamic) associated with a bank before getting involved with that bank (Sayani & Miniaoui, 2013).

Islam et al. (2017) suggested that if a bank expects increased returns (profitability) and takes up more risks, the chances of covering the equity by assets will be reduced which may lead to a potential financial distress or worse, bankruptcy. Bankruptcy is the legal status of an entity who is unable to repay the debt to the creditors, and where the firm's total liabilities exceed total assets (Joshi, 2019). Altman (1968) Z-score is a model that can help the investors foresee the bankruptcy of a certain company. He analyzed 33 publicly held US manufacturing bankrupt companies and their corresponding matches. Furthermore, he based his research on five, and by running a discriminant analysis on the data, he was able to develop a model that enhances bankruptcy prediction for publicly held US manufacturing companies. Business failures are a natural phenomenon in our economic system with firms entering and exiting as a function of overall business activity and expectations (Altman & Loris, 1976).

The aim of this study is to check the current level of financial distress among the listed banks that may lead up to a possible bankruptcy and whether the scenario of distress has got better or worse since the last time it was tested. The study by Mostafa et al (2016) uses information of the years from 2010 to 2014, however, a lot has changed since then

in the financial market and so the author wanted to revisit the arena and test how much has the risk of bankruptcy changed. The following section discusses literature related to Altman Z-score, Bangladeshi banking industry followed by methodology of the analysis leading to the empirical analysis and discussion of the findings.

2. Review of Literature

2.1 Altman Z- Score Model

Financial and accounting literature has repeatedly renewed the confidence in ratio analysis as a proficient tool to be used to predict corporate failure (Chieng, 2013). Ratios such as Cash flow ratio, Net-Income ratio, Debt to total assets ratio, Liquid-asset to total asset ratio, Liquid asset to current debt ratio and Turnover ratios were used by Beaver (1966) in the early days to analyze an organization. Later he used univariate technique to differentiate healthy and failing firms and calculated those ratios separately to assess financial health of firms. After his pioneering work on financial distress, Altman (1968) worked on this concept as he believed that the method of Beaver was less effective due to the lack many other important factors that may give idea about financial health or distress of a business.

This model has been adopted by researchers in various industries and in different economies and produced reliable results and this has led researchers to rely on this model. Altman (1983, 1993) has also suggested that the management of distressed firms can utilize the Z-Score model as a guide to a financial turnaround.

Grice and Ingram (2001) found that the relation between financial ratios and financial distress changes over time. They suggest that Altman's model is more beneficial for predicting financial distress of manufacturing firms than for predicting financial distress of non-manufacturing firms. Coats and Fant (1993) have found that bankruptcy is only one outcome of financial distress. Others include reorganization, liquidation, and acquisition by a viable firm.

Mostofa, Rezina and Hasan (2016) analyzed 25 banks in Bangladesh to check the level of financial distress using data for 5 years from 2010 from financial statements by using the Altman Z score model. They found that 24% of them were in the safe zone, 20% in the distress zone and 56% in the grey zone during the study period. Chowdhury and Ahmed (2009), from a similar study, found the banking industry to be bright and prospective but only considering parameters (ratios) that focus on measuring financial performance ignoring the criteria that represent overall financial health of the banking

industry. The author expects that the results from this recent study will benefit both the banks and the clients in making better decisions. For the banks, a scope to improve their performance whereas a chance for investors to be cautious before making any huge investment related decision.

Hamid et al. (2016) tried to check the level of bankruptcy of the financial market of Bangladesh by studying the non-banking financial institutions (NBFI) and they concluded that during their study period, most of the NBFIs were in the distress zone. Shar et al. (2010) worked on multiples banks of Pakistan to test the financial vulnerability and found that a good number of banks were found to be insolvent using the bankometere procedure.

Anjum (2012) found that Altman Z-score model is a safe and secure way of predicting financial distress and bankruptcy from one to three years in advance. According to her, Altman's Z-score model has 90.9% efficiency in predicting financial distress for one year prior to the company's bankruptcy which may work as sign for the potential investors. Celli (2015) also used the Z-score model and found the result to be reliable in predicting the risk of bankruptcy.

2.2 Banking Industry

The performance of bank as a financial institution in both developing and developed economies is vital for financial sectors growth (Saha & Anjum, 2020). Chowdhury and Ahmed (2009) found that the commercial banks were able to achieve a smooth growth during their study period in terms of both financial and non-financial attributes, like branches, employees etc. Laeven (1999) found that the banks with a combination of high efficiency and low risk-taking should be considered as the best ones, while not ignoring important non-financial factors like quality of service.

Considering the performances of banks, Samad (2008) concludes that banks in Bangladesh need more regulatory freedom in order to perform better. Rahman and Banna (2015), after working on banks of Bangladesh, found that irrespective of their business model, liquidity risk in banks is an ongoing and continues problem in the banking industry. After a similar study, Karim and Alam (2013) found that factors like size of bank, credit risk, operational efficiency and management of asset have significant impact on financial performance of Bangladeshi commercial banks.

Rahman and Banna (2015) complementing the results of Karim and Alam (2013) found that return on assets is a big contributor of profitability for Bangladeshi banks. Islam and Rana (2017) studied private commercial banks in Bangladesh for 10 years and

understood that profitability of banks is highly dependent on non-performing loans (NPL) and operating expenses where high NPL is a big threat to the progress.

Another issue of the banking industry, corporate governance was discussed by Ahmed et al. (2017) where they found that the study shows a positive relation between corporate governance and performances of banks. Another study by Reaz and Arun (2006) showed how political interference and failure by the regulators have made an impact to the governance issues in the banking industry.

Kittur (2019) studied banks of India for to check the level of distress and found that all the banks studied were in the safe zone. In a similar study by Chairunnisa and Arshed (2020), it was found that almost 99% of the Islamic banks studied from Indonesia were in the safe zone. The study on banks of Pakistan showed that most of the local banks are out of the financial distress as opposed to the foreign banks, are in big distress (Ullah, 2021). Saputri and Krisnawati (2020) also studied 30 listed banks of Indonesia but they found a contradictory result where none of the banks were in safe zone rather almost half were in gray zone and the other half in distress zone. Ezejiofor et al. (2014) used the Altman model on banks of Nigeria and determined that the model was highly efficient in predicting the potential failure of banks.

3. Hypothesis

Following the previous literature, the following hypotheses have been developed:

H_1: The publicly listed banks are out of the safe zone of financial distress.

Ijaz et al. (2013) conducted a similar study on companies of Karachi Stock Exchange where they studied companies for just one specific year. Jawabreh (2017) also worked on Z-score of just one year, where unfortunately they could not predict the financial failure. In order to fulfill this gap, the author decided to study the banks for a longer period of time to check whether the banks are in distress zone for a year or tend to stay in that zone.

H_2: The publicly listed banks tend to stay out of the safe zone of financial distress.

4. Methodology

4.1 Sample Size

For the analysis of the banking industry, all the public limited companies were chosen to be analyzed. However, 1% of the bottom outlier banks were excluded from the analysis to get a true and fair view of the overall banking industry. There are a total of 60 banks operating in Bangladesh through Bangladesh Bank Order, 1972 and Bank Company Act, 1991; among which 30 banks are publicly enlisted in the Dhaka Stock Exchange (DSE). The author worked on 29 of these enlisted banks for the purpose of the analysis. The worked-on sample size represents around 97% of the enlisted banks and almost half of the running banks of Bangladesh (some of which are specialized banks).

4.2 Data Collection

In order to understand the trend of the financial health of these banks and the industry all together, financial data of 5 years from 2015 to 2019 (inclusive) were collected and analyzed. The data was from the published financial statements (including notes to the financial statement). These statements were readily available on the websites of the respective banks.

4.3 Data Analysis

After collection and cleansing of the data, analysis to find the Z-score was done using the financial data of the banks from 2015 to 2019.

4.3.1 Altman Z-Score

Professor Edward Altman first developed Z-Score in an effort to measure firm's health and its probability of bankruptcy. Since then, this model has been employed as a tool for financial assessment by professionals and lenders. Widely used Altman Z-Score model (2014) developed for the non-manufacturing businesses is used in this study. Below presented Z- Score model.

$Z = 6.56*X1 + 3.26*X2 + 6.72*X3 + 1.05*X4$

Here,

X1= Working Capital/ Total Assets

X2= Retained Earnings/ Total Assets

X3= EBIT/ Total Assets

X4= Market Value of Equity/Total Liabilities

Result of Z-Score model can be interpreted as:

Z-Score above 2.6: The firm is safe.

Z-Score between 1.1 to 2.6: known as “Grey” zone.

Z-Score below 1.1: “distress” zone.

Even though the Z-Score model was developed more than 45 years ago, and many alternative failure prediction models exist, the Z-Score model continues to be used worldwide as a main or supporting tool for bankruptcy or financial distress prediction and analysis both in research and in practice (Altman et al. 2017).

5. Empirical Results

The collected and cleansed data was analyzed to get the Z-score of individual banks for the years from 2015 to 2019. As per the analysis, only one bank (Eastern Bank Ltd.) was found to be out of the distress zone throughout period studied, however it is found to be in the grey zone and not fully safe from financial distress, with an average Z-score of 1.90.

Among the other 28 banks for 5 years, only Uttara Bank Ltd. was in the distress zone for 2015 and 2016 after which, the situation got a little better and the bank moved to grey zone. Unfortunately, all the rest of the 27 banks were found to be in the financially distress zone throughout 2015 to 2019 based on their published financial figures. The average of Z-score of these 29 banks range from -1.24 to 1.9 (Table 1.1.1 & Figure 1.1.1).

Table 1.1.1: Average Z-score of 29 Banks from 2015-2019

Bank	**Average Z-Score**	**Bank**	**Average Z-Score**
EBL	1.90	SHAHJABANK	0.40
UTTARABANK	0.87	NCCBANK	0.38
UCB	0.72	CITYBANK	0.37
DUTCHBANGL	0.60	SIBL	0.36
ISLAMIBANK	0.55	ABBANK	0.34
STANDBANKL	0.54	FIRSTSBANK	0.27

PRIMEBANK	0.53	ONEBANKLTD	0.21
PUBALIBANK	0.52	NBL	0.13
ALARABANK	0.51	MTB	0.03
BRACBANK	0.50	SOUTHEASTB	-0.03
BANKASIA	0.49	DHAKABANK	-0.30
IFIC	0.48	TRUSTBANK	-0.40
MERCANBANK	0.47	EXIMBANK	-0.48
JAMUNABANK	0.44	RUPALIBANK	-0.94
		PREMIERBAN	-1.24

Source: Author's Calculation

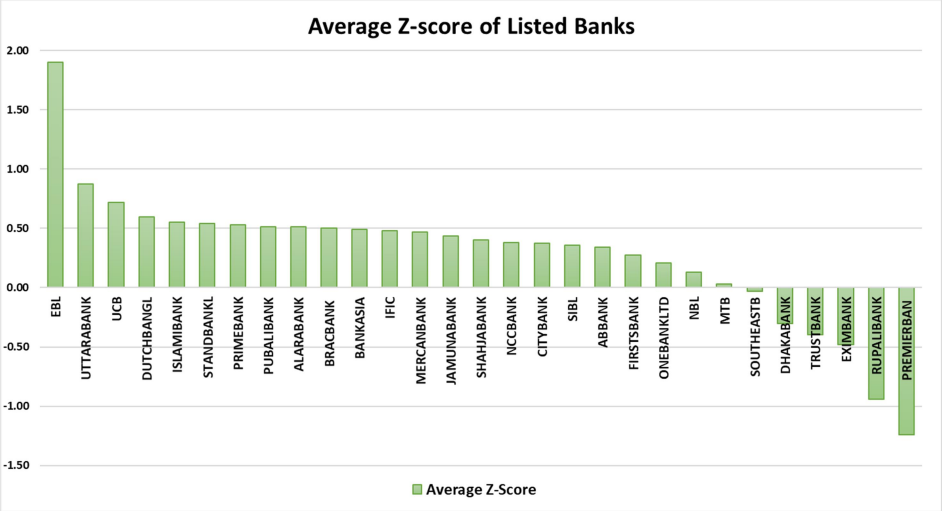

Figure 1.1.1: Average Z-score of 29 Banks from 2015-2019

The author also checked the amount of standard deviation of Z-score of each bank in the studied period (Table 1.1.2). The standard deviations of all the banks range between 0.05 to 0.93, which show that the Z-scores of each year are not very highly deviated from the average Z-score of that individual bank (Figure 1.1.1).

Table 1.1.2: Standard Deviation of Z-score of 29 Banks from 2015-2019

Bank	**SD**	**Bank**	**SD**	**Bank**	**SD**
ALARABANK	0.105	DUTCHBANGL	0.068	MTB	0.438
BANKASIA	0.078	BRACBANK	0.138	ONEBANKLTD	0.093
DHAKABANK	0.351	EBL	0.241	PRIMEBANK	0.241
FIRSTSBANK	0.067	EXIMBANK	0.073	PUBALIBANK	0.072
JAMUNABANK	0.367	IFIC	0.422	SIBL	0.076
MERCANBANK	0.115	SHAHJABANK	0.145	ISLAMIBANK	0.042
NBL	0.679	CITYBANK	0.553	TRUSTBANK	0.898
NCCBANK	0.208	SOUTHEASTB	0.497	UCB	0.055
PREMIERBAN	0.422	STANDBANKL	0.134	UTTARABANK	0.934
RUPALIBANK	0.576	ABBANK	0.115		

Source: Author's Calculation

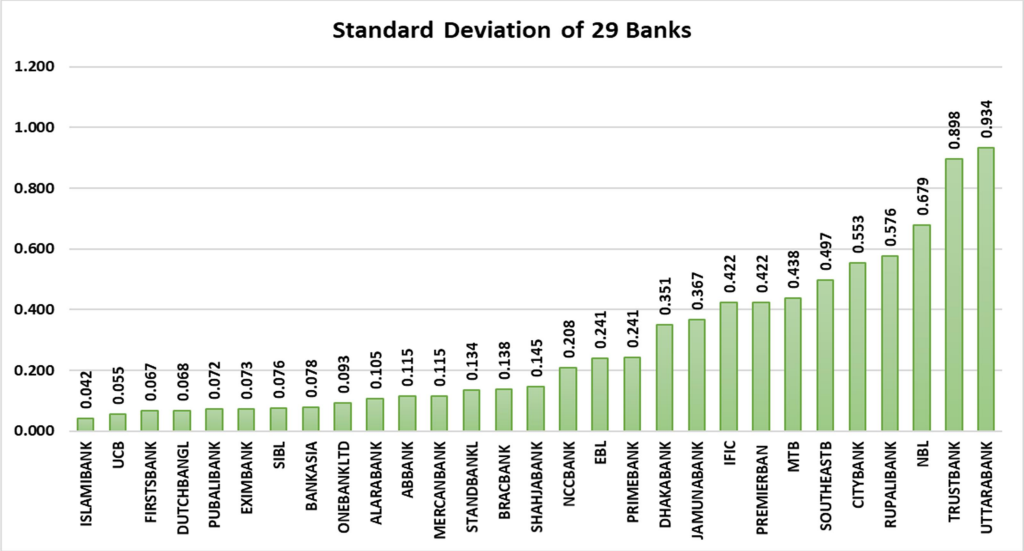

Figure 1.1.2: Standard Deviation of Z-score of 29 Banks from 2015-2019

If the yearly progression of the banks is to be considered, the scenario of the banking industry is very alarming as average annual Z-score of the listed banks is going downwards in a very sharp manner (Figure 1.2.1). The average Z-score of the banks in 2015 was 0.334, which later dropped to only 0.185 (Table 1.2.1).

Table 1.2: Average annual Z-score of the banking industry.

Year	**2015**	**2016**	**2017**	**2018**	**2019**
Average Z-score	0.334474	0.374071	0.329549	0.19845	0.184555

Source: Author's Calculation

Based on the results found, it can be said that the absolute figures or the amounts of money circulating among banks and related businesses may have increased over the years, but the financial performance to stay away from distress has not improved much. The alternative hypotheses of this study are to be accepted based on the calculated Z-scores of these listed banks. The results show that most of the banks are out of the safe zone and not just for a year rather for a longer period of time which shows that they are in financially distress position.

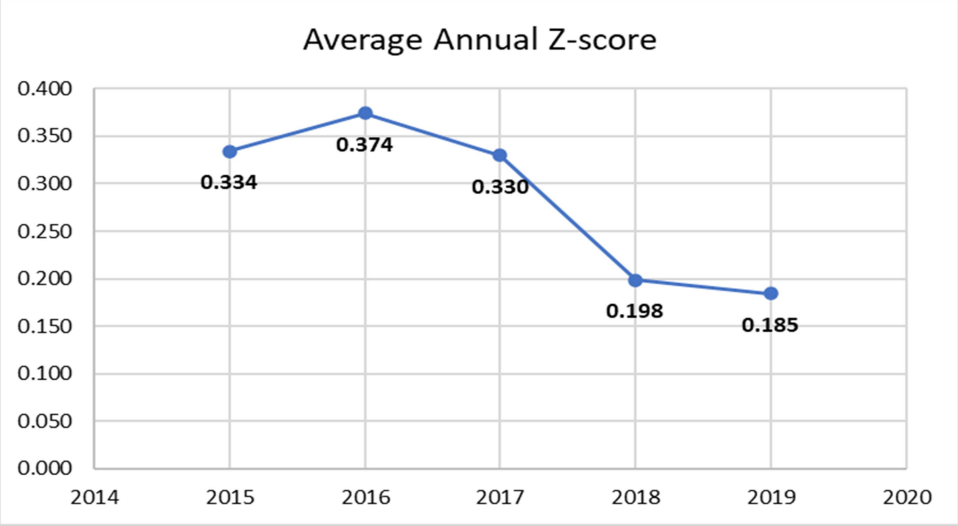

Figure 1.2: Average annual Z-score of the banking industry.

Based on the results found through the Z-score analysis, both the hypotheses can be accepted. During 2015 and 2016, 96.5% of the listed banks were out of the safe zone, even out of grey zone. Later, from 2017 to 2019 93% were in the distress zone. Except two banks, all the other banks were in distress zone, meaning having poor financial health and good chance of being bankrupt.

A full descriptive statistic of the Z-score calculated of these 29 banks during 2015 to 2019 is presented in the table 1.3.

Table 1.3: Descriptive Statistics of Z-Score on 29 banks.

Z Score			
Mean	0.284	Range	4.015
Standard Error	0.055	Minimum	-1.729
Median	0.402	Maximum	2.286
Mode	#N/A	Sum	41.212
Standard Deviation	0.658	Count	145
Sample Variance	0.433	Largest(1)	2.286
Kurtosis	1.840	Smallest(1)	-1.729
Skewness	-0.492	Confidence Level(95.0%)	0.108

Source: Author's Calculation

6. Conclusion

Altman (1983) suggested that the management of distressed firms can utilize the Z-Score model as a guide to financial turnaround. Although most of the firms are not financially healthy, this does not mean that they are going to be bankrupt soon as prediction of financial distress in a firm does not necessarily mean bankruptcy (Kumar & Anand, 2013).

Based on the analysis, it can be implied that the investors and other parties related to the banking industry need to be careful about any upcoming downfall of the industry. However, the current situation of the industry contradicts with the result found by Mostofa, Rezina and Hasan (2016). They found a major portion of the banks to be out of the distress zone whereas this study of the recent years shows that most of the banks (around 93%) are in the danger zone. Although the study does not try to find the cause of such a downfall, the results indicate that efficiency of banking operation may have been

hampered due to a huge of non-performing loans. Lending loans is one of the major fuels of running a banking business but if the loans do not bring in cash for the business, a financial distress leading up to a bankruptcy can be predicted.

For the purpose of getting a picture of the whole banking industry, the banks have been individually scrutinized to check the continuity of the distress. However, due to some limitations, the causes of the financial distress were beyond the scope of this study. This limitation of the study arises future research directions to find the possible reasons of this kind of distress. Studies related to financial distress in other industries of the country can also be conducted to get a true and fair view of the financial health of those industries.

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