

# An Empirical Analysis of Liquidity, Profitability and Solvency of Bangladeshi Banks

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## Abstract

The financial sector of Bangladesh is small and underdevelopment and this sector resides of banking and an emerging capital market. The banking sector in the country comparatively more developed than the equity market, even though both are developing in international benchmark. In light of recent events that have taken place in the Bangladesh, the importance of knowing the financial position of banks is imperative for investors. Most investor use balance sheet, income statement, change in equity and statement of cash flow to calculate different ratios for technical analysis. Investor uses this ratio and trend analysis to invest in capital market. In this research I take 29 banks as sample size and calculate their different ratios. For examining the applicability of Altman's Z-Score model to forecasting banking failures. The emphasis of this research is to endorse the cogency of Altman's Z-Score model as a predictor of Bangladeshi bank failures. I after analyzing the all sample banks Z-Score I found that 7 banks are in healthy financial position and 22 banks are in insolvent during the time period of FY 2009-2014. Islamic or Shariah follower banks are doing better than conventional banks. State owned banks are doing better than before. This research indorses that those banks are in insolvent zone for their published financial review or trend statement. This supplementary material is probable to intensification stockholder assurance by their ability to make more conversant decisions.

**Keywords:** Financial performance; Liquidity; Bankruptcy; Bangladesh; Bank; Credit risk; Z-score; Bank profitability

## Introduction

For bankruptcy companies in general and public shareholding will suffer financial distress. Not only owners are affected, but also other financial statements users, such as investors, creditors, and the economy in general will also be affected. Consequently, an early warning of bankruptcy could be taken as a precaution to be established to lower the risk and danger levels of company bankruptcy or distress. The motivation for this study arises from the arguments made by several authors who identified financial ratios and financial indicators that are used as a yardstick for bankruptcy prediction. It is based on where he compared a number of financial ratios of group of companies for the five years prior to bankruptcy period with another group of companies that are not bankrupt [1]. Then Altman [2,3], developed a model (Altman's score) which was the most renowned model in predicting company bankruptcy using financial ratios. Mr. Mahtab [4] has done another study and that was focused on Bangladeshi two groups of Banks, Conventional and Islamic Banks. So I focused my study on the performance evaluation of Bangladeshi Banks. I discuss about many ratios and performance indicator and compare their efficiency and effectiveness of operations of Banks in term of their return on investment, return on asset, return on equity and other company performance indicator. The research was based on secondary data and they are collected from five banks published annual reports. These data were analysed to test the financial performance of the banks by using ratio analysis which were selected by Altman Z score model. Those ratios are liquidity, profitability, efficiency and financial leverage. Working capital shows the position of a company's liquidity, efficiency, and overall health and it includes cash, inventory, accounts receivable, accounts payable and the portion of debt due within one year. Positive working capital generally indicates that a company is able to pay off its short-term liabilities almost immediately. Negative working capital generally indicates a company is unable to do so. The retained earnings of a company are the percentage of net income this is not paid out as dividends to its shareholders and it is retained to reinvest or to pay down debt that is accumulated over the year. The lower the outcome of

ratio, the more a company is funding assets by borrowing or through retained earnings which again increases the risk of bankruptcy if the firm cannot meet its debt obligations. Companies with low profit margins tend to have high asset turnover, while those with high profit margins have low asset turnover. Companies in the retail industry tend to have a very high turnover ratio due mainly to cutthroat and competitive pricing. The measure of a company's financial leverage Debt-equity ratio relates the amount of a firm's debt financing with the amount of equity financing. CI Staff [5], indicator such as Earnings before Interest & Taxes to Total Assets is a variation on return on assets, and that show the efficiency of a company. This ratio assesses a firm's ability to generate profits from its assets before deducting interest and taxes. It Measures operating efficiency apart from tax and leveraging factors. It recognizes operating earnings as being important to long-term viability of banks and indicates a percentage of customer deposits; customer deposits as a percentage of total liabilities, and total equity as a percentage of total assets were computed to compare banks financial performance.

## Problem Statement

The focus of my study is to apply an evolved model of Altman's Z score namely the 'Z' Score model [6] to failed banks. This model overcomes the manufacturing limitation of Altman's pioneering model and can be used on financial institutions. The main objective is to verify if the 'Z' Score is a true indicator of financial failure for a financial institution. The recent global crisis has demonstrated the importance

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of banks both at national and international levels. Business failures are a natural phenomenon in Bangladeshi economic system with firms entering and exiting as a function of overall business activity and expectations [7].

Corporate failure is the sequential conclusion due to systematic and non-systematic factors. Financial and accounting literature has over and over again renewed the confidence in ratio analysis as a proficient predictor of corporate failure. Nevertheless, more attention should be focused on the prediction of banking failures [8].

Financial performance is a subjective measure of how well a firm can use assets from its primary mode of business and generate revenues. The financial performance is also used as a general measure of overall financial health performance over the period. There are many different ways to measure financial performance. As far as ratios are concerned, there are numbers of ratios existing to evaluate the financial performance of a firm. These ratios can be classified into several categories such as liquidity ratios, profitability ratios, solvency ratios etc. Another effective indication of corporate performance in predicting financial solvency of a firm is Altman's Z-score. This is nothing but a combination of financial ratios to form an index of profitability. The ratios used to calculate Z-score are working capital to total assets, retained earnings to total assets, EBIT to total assets, market value of equity to total liabilities and sales to total assets [4].

In Bangladesh the Z score does not apply to every situation. It can only be used for forecasting if the company being analysed can be compared to the database. The Z-score formula for predicting bankruptcy was developed in 1968 by Edward I. Altman, a financial economist and professor at the Leonard N. Stern School of Business at New York University. The Z-score is a multivariate formula for a measurement of the financial health of a company and a powerful diagnostic tool that forecasts the probability of a company entering bankruptcy within a 2 year period. A good way to measure the possibility of bankruptcy is to use Z score model [2]. Therefore many companies in Bangladesh are suffering from financial distress risk due to very poor management capability and operating inefficiency although its reflection to the stock price is absent from the market in many instances. The Altman Z score, model though may not be fully applicable for companies in Bangladesh, yet proves its strong validity and correctness in predicting financial status of the Z category companies [9].

The Problem Statement of this research is to "Measure the financial performance of the banking sector in Bangladesh by using various standard of ratio as current ratio, Retained earnings to total assets ratio, return on assets ratio, book value of equity to total liabilities ratio and linking all of them together to find out the impact on profitability through the use of Altman Z Score".

## Purpose of the Study

1. To measure the financial performance of Bangladesh Banking Sector using Altman's Z-score test and ratio analysis.
2. To test the correlations of five ratios with Z-score.
3. To measure the short-term financial position between five banks through liquidity ratios.
4. To analyse the short-term profitability position between five banks through profitability ratios.
5. To analyse the efficiency between five banks through efficiency ratios.

6. To analyse the leverage of five banks through financial leverage ratios

## Literature Review

### Altman's Z-score

The Altman Z-Score (Named on Edward Altman, New York University professor) is a combination of five financial ratios to estimate the financial position of a company and also a toll for predict corporate bankruptcy. Though Altman planned to invent the Z-Score in the 1960s, the concept of trying to predict which companies would bankrupt was new in that time. Altman use a statistical analysis called multivariate analysis to investigate some traditional ratio-analysis. These give him a concept that not only the effects of several ratios on the "performance of company" bankruptcy model, but to consider how those ratios affected each other's in this model. Edward I. Altman [2], after evaluating 66 companies Altman developed Z-Score model, half of them was filed for bankruptcy between 1946 and 1965. He started investigating his model with 22 ratio, then he classified them into five categories. They are:

1. Liquidity Ratio
2. Profitability Ratio
3. Leverage Ratio
4. Solvency Ratio
5. Activity Ratio

Edward I. Altman [2], Altman model is 90% accurate in classifying the bankrupt firms and 80% accurate in speculating the next financial situation. In 2009, Morgan Stanley strategy analyst, Graham Secker, used the Z-score to rank a basket of European companies. He found that the companies with weaker balance sheets underperformed the market more than two thirds of the time. Morgan Stanley also found that a company with an Altman Z-score of less than 1 tended to underperform the wider market by more than 4%. The Altman model has been used in air transport to successfully predict carrier failures as early as the 1980s where it correctly presaged the bankruptcy filings of both Braniff and Continental [10], and in subsequent years to track airline financial performance. Because of the significant increase in the use of leasing to finance assets in this industry, that model has become less reliable over time. Jhon Aiyabei [11], analyze the financial performance of small business firms based on MDA for the measurement and significance of financial distress. Lin Lin and Jenifarpisse [12], used Conditional probability analysis (CPA) model to determine merger acquisitions to prediction of the corporate failure.

The Z-Score model was based on 66 sample of manufacturing company; half of them were same pair groups. The formula for the Z-Score is:

$$Z = 6.56T1 + 3.26T2 + 6.72T3 + 1.05T4$$

$$T1 = (\text{Current Assets} - \text{Current Liabilities}) / \text{Total Assets}$$

$$T2 = \text{Retained Earnings} / \text{Total Assets}$$

$$T3 = \text{Earnings before Interest and Taxes} / \text{Total Assets}$$

$$T4 = \text{Book Value of Equity} / \text{Total Liabilities}$$

This equation gives a coefficient from the result of step by step multiple discriminate analysis or MDA regression (Table 1). Richard D [13], there is a reverse situation for ratios value. High ratios increase the Z score and minimize the risk of failure, on the other hand low ratios increase the risk of failure. The values were derived from the

Situation	Z-Score	Indicator	Remarks
1	Less than 1.1	Insolvent	The score indicates a high probability of distress within this time period.
2	Among 1.1 and 2.66	Healthy	There is a good chance of the company going bankrupt within the next 2 years of operations
3	2.6 and above	Secure	The company is considered 'Safe' based on the financial figures only.

**Table 1:** Z-Score and survivability indicators.

intercept of Z score. Altman [2], found that the values of the Z were 1.1 and 2.66. Firms with scores of <1.1 fit a bankruptcy profile, while firms with scores >2.6 fit the solvency profile. Scores between the two values lie in what Altman [2] called the "gray zone" where profiling is more difficult. If the analyst wanted one key score in place of the "gray zone," he argued for a 2.6 cut off because that zone contained.

### T1 working capital / total asset

Working capital is needed for day-to-day operations. Working capital is a common measure of a company's liquidity, efficiency, and overall health. It includes cash, inventory, accounts receivable, accounts payable and the portion of debt due within one year.

Positive working capital generally indicates that a company is able to pay off its short-term liabilities almost immediately. Negative working capital generally indicates a company is unable to do so.

The formula of Working Capital to Total Asset is:

$$\text{Working Capital to Total Asset Ratio} = \frac{\text{Working Capital}}{\text{Total Asset}}$$

There are several ways to evaluate a company's working capital. Such as, by calculating the inventory-turnover ratio, the receivable ratio, the payable ratio, the current ratio and the quick ratio.

Working capital management is a very important factor, which has a direct positive effect on profitability as well as liquidity of the company. Liquidity and profitability are both the two different sides of same coin. Optimum level of liquidity guarantees a firm to meet their short term debts and the proper management of flow can be promised by a profitable business. The most important items inside determination of working capital are inventories of the corporation, its accounts receivables and payables [14]. The management of working capital frequently considered a tool to maintaining competence of the business inside their operations. Working capital is often assessed by lenders to judge the financial short term paying back ability in difficult financial period [15].

There is a strong linear relationship between profitability of the firm and its working capital efficiency. The ability of the company to earn profit can be referred to as the profitability of that company. Profit is determined by deducting expenses from the revenue incurred in generating that revenue. The amount of profit can be a good measure of the performance of a company, so I can use profitability as a measure of the financial performance of a company. Proper Working capital management ensures that the company increased its profitability. Effective working capital management is very important due to its significant effect on profitability of company and thus the existence of company in the market. Efficient working capital management involves planning and controlling current assets and current liabilities in a manner that eliminates the risk of inability to meet due short term obligations on the one hand and avoid excessive investment in these assets on the other hand [14,16].

Mobeen Ur Rehman and Naveed Anjum [15], empirically examine the effects of working capital management on the profitability of Pakistan cement industry. Secondary Data was collected from Annual Reports and the sample size is 10 consisting of Pakistan cement Companies listed in KSE from 2003-2008. The relationship between working capital management and profitability is examined using statistical tools. The result accepts the hypothesis that there is a positive relationship between working capital management and profitability on the cement sector of Pakistan. Deloof [14,17], discussed that most firms had a large amount of cash invested in working capital. It can therefore be expected that the way in which working capital is managed will have a significant impact on profitability of those firms. Using correlation and regression tests he found a significant negative relationship between gross operating income and the number of days accounts receivable, inventories and accounts payable of Belgian firms. On basis of these results he suggested that managers could create value for their shareholders by reducing the number of days' accounts receivable and inventories to a reasonable minimum. The negative relationship between accounts payable and profitability is consistent with the view that less profitable firms wait longer to pay their bills.

### T2 retained earnings / total assets

The retained earnings of a company are the percentage of net income this is not paid out as dividends to its shareholders and it is retained to reinvest or to pay down debt that is accumulated over the year. The retained earnings to total asset ratio is calculated as follows:

$$\text{Retained Earnings to Total Assets ratio} = \frac{\text{Retained Earnings}}{\text{Total Asset}}$$

Total assets refer to the total amount of assets that is owned by an organization. And the assets must have the economic value that is expended over time to yield a benefit for the owner. Assets are also classified on the balance sheet as either current assets or long term assets. A current asset, such as an account receivable is expected to be liquidated within one year. A long-term asset, such as a fixed asset, is expected to be liquidated in more than one year.

Through retained earnings to Total Assets I measure the extent to which a company relies on debt or leverage on that particular year. The lower the outcome of ratio, the more a company is funding assets by borrowing instead of through retained earnings which again increases the risk of bankruptcy if the firm cannot meet its debt obligations

Retained Earnings/Total Assets indicates how much assets will be financed from retained earnings. The increase in retained earnings will give capital adequacy to the firm and which indicates favorable impact on debt to equity ratio [18].

Retained Earnings to Total Assets measures the amount of reinvested earnings or losses, which reflects the extent of the company's leverage. Companies that have low RE/TA are financing capital expenditure through borrowings rather than through retained earnings. Companies which have high RE/TA suggest a history of profitability and the ability to stand up to a bad year of losses [19].

Retained earnings is the account which reports the total amount of reinvested earnings or losses of a firm over time. The account is also referred to as earned surplus. It should note that the retained earnings account is subject to manipulations. In addition the RE\TA ratio measures the leverage of a firm. those Firms with high RE. Relative to low RE, financed their assets through retention of profits and have not utilized as much debt [2].

Retained earnings to total assets are an indicator of the “cumulative profitability” of the firm overtime which indicates the efficiency of management in manufacturing, Sales, Administration and other activities [20].

Retained earnings to total assets measures profitability that reflects the company’s age and earning power [21].

Retained earnings represent the accumulation of earnings that have remained within the entity. Retained earnings can be affected by reorganizations and stock dividend declarations, if so, consideration should be given to readjusting retained earnings. To increase retained earnings a company must generate profits either through operations or the profitable sell-off of assets or division or the forgiveness of the debt [22].

The ratio indicates the ability of a firm to earn profit and thereby securing retained earnings. Normally a firm has higher retained earnings, a firm will not starve for liquidity crunch and also the firm can reinvest in the appropriate venture at cheaper cost [23].

### T3 Operating earnings / total assets

CI Staff [5] this is a variation on return on assets, which is net income divided by total assets. This ratio assesses a firm’s ability to generate profits from its assets before deducting interest and taxes. It Measures operating efficiency apart from tax and leveraging factors. It recognizes operating earnings as being important to long-term viability.

Earnings before interest and tax (EBIT) to total assets ratio indicates a proportion between the measure that shows company’s profitability and company’s assets [8]. It measures the productivity of the firm’s assets notwithstanding any tax or leverage factors. “Since a firm’s ultimate existence is based on the earning power of its assets, this ratio appears to be particularly appropriate for studies dealing with corporate failure” [2]. In short, it represents general profitability of the company’s assets. EBITDA would not be a very accurate measure of a bank’s financial position as it takes into account depreciation and amortization which would not be applicable to the nature of a bank’s operations.

This ratio is calculated by dividing the total assets of a firm into its earnings before interest and tax reductions. Vineet Chouhan, Bibhas Chandra and Shubham Goswami [24], Predicting financial stability of select BSE companies revisiting Altman Z score In essence, it is a measure of the true productivity of the firm’s assets, abstracting from any tax or leverage factors. Since a firm’s ultimate existence is based on the earning power of its assets, this ratio appears to be particularly appropriate for studies dealing with corporate failure. Furthermore, insolvency in a bankruptcy sense occurs when the total liabilities exceed a fair valuation of the firm’s assets with value determined by the earning power of the assets. (EBIT/TA) is a version of return on assets (ROA), an effective way of assessing a firm’s ability to squeeze profits before factors like interest and tax are deducted.

This ratio is used to evaluate the company’s ability to generate operating profit with existing asset. When the company has high profit with low asset, it has a relatively low chance of getting default. It is due to the dollar of asset that is able to generate a larger amount of operating profit. On the other way, lower income might not be enough to cover company’s daily expenses (Thai, 2014) Earnings before interest and tax (EBIT) to total assets ratio indicates a proportion between the measure that shows company’s profitability and company’s assets [25]. In short, it represents general profitability of the company’s assets. Data to calculate this ratio is collected from the income statement and balance sheet.

There are no general norms for this ratio. It is recommended to compare this ratio to those of the companies, working within the same industry.

$$EBIT \text{ to Total Asset Ratio} = \frac{EBIT}{Total \text{ Asset}}$$

Earnings before interest and taxes (EBIT) equal net income, plus interest expense, plus taxes. Assets (Total assets) - a balance sheet item, representing what a company owns

### T4 Market value of equity / book value of total liabilities

This is a measure of a company’s financial leverage. It is reciprocal of the familiar debt-equity ratio. Debt-equity ratio relates the amount of a firms’ debt financing with the amount of equity financing. Market Value of Equity is the total current market value of all common and preferred shares on the other side Book Value of Total Liabilities is the sum of all current and long-term liabilities of a firms’ balance sheet. If a company has no debt that is unlevered firm, there is some sort of benefit with debt. By acquiring debt financing firm get extra money for investment and make a tax shield from the debt [26]. That is the leverage and debt-equity ratio show the picture how a firm using the debt to maximizing profit. What is considered a “high” debt-to-equity ratio differs depending upon the industry, because some industries tend to utilize more debt financing than others. There is no single value above which would be deemed a high debt-to-equity ratio. For calculation of debt-equity ratio I have to divide firm’s equity with the total amount of debt.

$$Equity \text{ to Debt ratio} = \frac{Market \text{ Value of Equity}}{Book \text{ Value of Total Liabilities}}$$

Vikas Tyagi, describes that a higher debt-equity ratio generally means that a company has been aggressive in financing its growth with debt [27]. This can result in unpredictable earnings as a result of the additional interest expense. If a lot of debt is used to finance increased operation, the company could potentially generate more earnings than it would have without this outside financing. If this were to increase earnings by a greater amount than the debt cost, then the shareholders benefit as more earnings are being spread among the same amount of shareholders. However, the cost of this debt financing may outweigh the return that the company generates on the debt through investment and business activities and become too much for the company to handle. This can lead to bankruptcy, which would leave shareholders with nothing.

The debt-equity ratio also depends on the industry in which the company operates. If capital intensive industries as auto manufacturing tend to have a debt-equity ratio above 2, while personal computer companies have a debt-equity of under 0.5 [28]. The financial industry, for example, typically has a higher debt-to-equity ratio. This is for the fact that banks and other financial institutions borrow money to lend money, which results in a higher debt-equity ratio. There are more sectors that have high capital structure so they have higher debt-equity ratios, such as services, utilities and the industrial goods sector. As a result, investors must look at a company’s historical debt-to-equity ratio figures to determine if there have been significant changes that could indicate a red flag. In addition, investors must also make comparisons between other similar companies and the industry as a whole to determine if a particular firm has what could be considered a high debt-to-equity ratio.

Optimal debt-equity ratio is considered to be about liabilities = equity, but the ratio is very industry has this type ratio because it depends on the proportion of current and non-current assets. The more

non-current the assets and equity is required to finance these long term investments [29]. A higher total debt-to-equity ratio indicates that the sector has been increasing the relative share of debt in external financing, whereas a lower debt-to-equity ratio indicates that the sector is financing a decreasing proportion of its activities through debt as compared to financing through their equity. Variations in the market value of equity can also cause changes in the ratio. Therefore, if a financial corporation's ratio is 3.5 it means that the liability outstanding is 3.5 times larger than their shareholder's equity. Higher debt can result in volatile earnings due to additional interest expense as well as increased vulnerability to business solvency [29]. However, opposing to what many believe, debt is not necessarily a bad thing, it can be positive, provided it is used for productive purposes such as purchasing assets and improving processes to increase net profits. Also, the debt-to-equity ratio is more significant when relate over a period of time. Non-consolidated debt data gives important info about the total liability of the financial corporation's sector. For these reason Edward I. Altman [2] us this ratio as a variable for his Z-Score model for a better concept of a firms' financial performance.

## Research Framework

$$Z = 6.56T1 + 3.26T2 + 6.72T3 + 1.05T4$$

$$T1 = (\text{Current Assets} - \text{Current Liabilities}) / \text{Total Assets}$$

$$T2 = \text{Retained Earnings} / \text{Total Assets}$$

$$T3 = \text{Earnings before Interest and Taxes} / \text{Total Assets}$$

$$T4 = \text{Book Value of Equity} / \text{Total Liabilities}$$

## Research Questions

**Q<sub>1</sub>:** What is the relationship between Working Capital to Total Assets and Z-score?

**Q<sub>2</sub>:** What is the relationship between Retained Earnings to Total Assets and Z-score?

**Q<sub>3</sub>:** What is the relationship between EBIT to Total Assets and Z-score?

**Q<sub>4</sub>:** What is the relationship between Market Value of Equity to Total Liabilities Z-score?

## Hypothesis

**Ho<sub>1</sub>:** There is a negative relationship between Working Capital to Total Assets and Z-score.

**Ha<sub>1</sub>:** There is a positive relationship between Working Capital to Total Assets and Z-score.

**Ho<sub>2</sub>:** There is a negative relationship between Retained Earnings to Total Assets and Z-score.

**Ha<sub>2</sub>:** There is a positive relationship between Retained Earnings to Total Assets and Z-score.

**Ho<sub>3</sub>:** There is a negative relationship between EBIT to Total Assets and Z-score.

**Ha<sub>3</sub>:** There is a positive relationship between EBIT to Total Assets and Z-score.

**Ho<sub>4</sub>:** There is a negative relationship between Market Value of Equity to Total Liabilities and Z-score.

**Ha<sub>4</sub>:** There is a positive relationship between Market Value of Equity to Total Liabilities and Z-score.

## Research Design

Research design is crucial as it acts as a blueprint for the collection, measurement and analysis of data. In this study, I have selected ex post facto design, because this study required structured and précised way to show the relationship among different variables and to test hypotheses.

### The method of data collection

Under the method of data collection, I have selected secondary data through annual report. Because I wanted to communicate with different employees of banks by asking them many questions.

### Researcher control of variables

In ex post facto research I uses historical data that cannot be manipulated by researchers. In my research my dependent variable is financial performance and that cannot be changed by me. My research could be stated as ex post facto design.

### Degree of research question crystallization

My study was Formal study as I tried to explain the relationship among different variables.

### Purpose of the study

My study was designed for testing hypotheses quantitatively which required a good number of samples which reflected the investor.

### The time dimension

I focused on longitudinal study. I have studied on 29 different banks of Bangladesh as samples for and they did not need to be studied again for the same study. I have analyzed 6 years annual report data.

### The topical scope

The topical scope for my research is statistical study. I used statistical analysis to collect quantitative information because it is designed for breadth instead of depth.

### The research environment

My research occurred in actual environment conditions. My research environment could be specified as stimulation. This option was chosen because I had to receive information from historical data and relationships in variables of my study were required.

### Sampling

In Bangladesh, the total number of banks is 64 where state-owned banks are 4, private commercial banks are 32, Islamic commercial banks are 8, foreign banks are 09 and specialized banks are 11. So, this is not possible to take all the banks as a research data for the research and it is also not possible to evaluate all the banks financial performance. For this reason to obtain a probable result, a sampling procedure has been conducted.

**Sample unit:** For doing the research, I have taken private commercial banks and state-owned banks as a sample unit to evaluate the financial performance and to find out what effects will occur on profitability.

**Sample size:** For getting a better result, I have taken different level of private commercial banks as a sample size and those are Bank Asia

Limited, AB Bank Limited, Brac Bank Limited, Dautch Bangla bank Limited, Dhaka Bank Limited, Agrani Bank Limited, Basic Bank Limited, Easter Bank Limited, IFIC Bank, Janata Bank, Mercantile Bank Limited, Mutual Trust Bank Limited, One bank Limited, Premier Bank Limited, Prime Bank Limited, Pubali Bank Limited, Rupali Bank Limited, Shahjala Bank Limited, Social Islami Bank Limited, Standard Bank Limited, South East Bank Limited, Trust Bnak Limited, The City Bank, United Commercial bank Limited, Islami Bank Limited, Exim Bank Limited, ICB Islamic Bank Limited, Fist Security Islami Bank Limited, Uttara Bank Limited and it will help me to complete my research. The total sample size for the research is 29.

**Sample procedure:** The most important step for sampling is that how I do my research and collect data for getting the proper information. It is not sure that the providing information after the research is accurate because the research is based on secondary data and the total sample size is only 29. For that reason, this sample procedure will be probability sample procedure.

### Data Analysis

In 2009, Z-Score of Bank Asia Limited is 1.829080966 so that bank was performing good as this is greater than 1.1 so bank's financial position was healthy up to 2011. From 2011 to 2014, Bank Asia Limited's performance was below 1.1 and that is declining trend of performance. On an average Z-Score value is 0.946211502, this is also stating the fact that the Bank Asia was insolvent. From Table 2, we can see that Bank Asia Limited's overall financial position is insolvent and trend shows that performance is getting worse.

In 2009, Z-Score of AB Bank Limited are 5.555341493 so that bank was performing good as this is greater than 2.6 so bank's financial position was secure. In 2010 AB Bank Limited was healthy. From 2011 to 2014, AB Bank Limited's performance was below 1.1 and that is declining trend of performance. On an average Z-Score value is 1.658249831, this is also stating the fact that the AB Bank Limited was insolvent. From Table 3, we can see that AB Bank Limited's overall financial position is Healthy and trend shows that performance is getting worse.

In 2009, Z-Score of Brac Limited is -0.045822189 so that bank was performing poorly as this is less than 1.1 so bank's financial position was insolvent. From 2010 to 2014, Brac Bank Limited's performance was below 1.1. On an average Z-Score value is 0.021480171, this is also stating the fact that the Brac Bank Limited was insolvent. From

Year	Z-Score	Indicator	Average
2009	1.829080966	Healthy	0.946211502
2010	1.268538299	Healthy	
2011	1.451911972	Healthy	
2012	0.530534185	Insolvent	
2013	0.360403495	Insolvent	
2014	0.236800094	Insolvent	Insolvent

Table 2: Data analysis of Bank Asia..

Year	Z-Score	Indicator	Average
2009	5.555341493	Secure	1.658249831
2010	1.052672451	Healthy	
2011	0.967978315	Insolvent	
2012	1.018492668	Insolvent	
2013	0.759504208	Insolvent	
2014	0.595509853	Insolvent	Healthy

Table 3: Data analysis of AB Bank limited..

Table 4, we can see that Brac Bank Limited's overall financial position is insolvent and trend shows that performance is getting better.

In 2009, Z-Score of Dautch Bangla Bank Limited is 1.005247418 so that bank was performing poorly as this is less than 1.1 bank's financial position was insolvent. From 2010 to 2014, Dautch Bangla Bank Limited's performance was below 1.1. On an average Z-Score value is 0.812640457, this is also stating the fact that the Dautch Bangla Bank Limited was insolvent. From Table 5, we can see that Dautch Bangla Bank Limited's overall financial position is insolvent and trend shows that Z-score volatility is too high.

In 2009, Z-Score of Dhaka Bank Limited is 1.224478092 so that bank was performing good as this is greater than 1.1 so bank's financial position was healthy. From 2011 to 2014, Dhaka Bank Limited's performance was below 1.1 and that is declining trend of performance. On an average Z-Score value is 1.041098355, this is also stating the fact that the Dhaka Bank Limited was insolvent. From Table 6, we can see that Dhaka Bank Limited's overall financial position is insolvent.

In 2009, Z-Score of Agrani Bank Limited 0.003339096 so that bank was performing poorly as this is less than 1.1 so bank's financial position was Insolvent. From 2010 to 2014, Agrani Bank Limited's performance was below 1.1 and that is declining trend of performance. On an average Z-Score value is 0.084776014, this is also stating the fact that the Agrani Bank Limited was insolvent. From Table 7, we can see

Year	Z-Score	Indicator	Average
2009	-0.045822189	Insolvent	0.021480171
2010	-0.286252537	Insolvent	
2011	-0.106734377	Insolvent	
2012	-0.113000077	Insolvent	
2013	0.039942471	Insolvent	
2014	0.640747732	Insolvent	

Table 4: Data analysis Brac Bank limited.

Year	Z-Score	Indicator	Average
2009	1.005247418	Insolvent	0.812640457
2010	0.455119337	Insolvent	
2011	0.679372597	Insolvent	
2012	1.000651292	Insolvent	
2013	0.92297793	Insolvent	
2014	0.812474169	Insolvent	

Table 5: Data analysis of Dautch Bangla Bank limited.

Year	Z-Score	Indicator	Average
2009	1.224478092	Healthy	1.041098355
2010	0.986605678	Insolvent	
2011	1.003653894	Insolvent	
2012	1.046265571	Insolvent	
2013	0.985375779	Insolvent	
2014	1.000211114	Insolvent	

Table 6: Data analysis of Dhaka Bank limited.

Year	Z-Score	Indicator	Average
2009	0.003339096	Insolvent	0.084776014
2010	-0.162509365	Insolvent	
2011	-0.002784539	Insolvent	
2012	-0.38602878	Insolvent	
2013	0.532524765	Insolvent	
2014	0.524114909	Insolvent	

Table 7: Data analysis of Agrani Bank limited.

that Agrani Bank Limited's overall financial position is insolvent and trend shows that performance is getting better.

In 2009, Z-Score of Basic Bank Limited is 5.824081263 so that bank was performing good as this is greater than 2.6 so bank's financial position was secure. From 2010 to 2013, Basic Bank Limited's performance was more than 1.1 and that indicate that bank was in healthy financial position. In 2014 Basic Bank Limited was insolvent. On an average Z-Score value is 2.29114436, this is also stating the fact that the Basic Bank Limited was healthy. From Table 8, we can see that AB Basic Bank Limited's overall financial position is Healthy and trend shows that performance is getting worse.

In 2009, Z-Score of Eastern Bank Limited is 1.153197804 so that bank was performing good as this is greater than 1.1 so bank's financial position was healthy. In 2010, Eastern Bank Limited's financial position was insolvent. On an average Z-Score value is 2.329345782, this is also stating the fact that the Eastern Bank Limited was healthy. From Table 9, we can see that Eastern Bank Limited's overall financial position is Healthy.

In 2009, Z-Score of IFIC Bank Limited is 1.153197804 so that bank was performing good as this is greater than 1.1 so bank's financial position was healthy. In 2010 IFIC Bank Limited was insolvent. From 2011 to 2014, IFIC Bank Limited's performance was below 1.1 and that is declining trend of performance. On an average Z-score value is 2.29345782, this is also stating the fact that the IFIC Bank limited was Healthy. From Table 10, we can see that IFIC Bank Limited's overall financial position is Healthy and trend shows that performance is getting better.

In 2009, Z-Score of Janata Bank Limited is 0.853929515 so that bank was performing poorly as this is less than 1.1 so bank's financial position was insolvent. In 2010, Janata Bank Limited's financial position was insolvent. From 2011 to 2014, Janata Bank Limited's performance was

below 1.1 and that is declining trend of performance. On an average Z-Score value is 0.364374669, this is also stating the fact that the Janata Bank Limited was insolvent. From Table 11, we can see that Janata Bank Limited's overall financial position is insolvent and trend shows that performance is getting worse.

In 2009, Z-Score of Mercantile Bank Limited is 0.633749043 so that bank was performing poorly as this is less than 1.1 so bank's financial position was secure. From 2010 to 2014, Mercantile Bank Limited's performance was below 1.1 and that is declining trend of performance. On an average Z-Score value is 0.284227138, this is also stating the fact that the Mercantile Bank Limited was insolvent. From Table 12, we can see that Mercantile Bank Limited's overall financial position is insolvent and trend shows that performance is getting worse.

In 2009, Z-Score of Mutual Trust Bank limited is 0.857734615 so that bank was performing poorly as this is less than 1.1 so bank's financial position was insolvent. From 2010 to 2014, Mutual Trust Bank Limited's performance was below 1.1 and that is declining trend of performance. On an average Z-Score value is 0.434647794, this is also stating the fact that the Mutual Trust Bank Limited was insolvent. From Table 13, we can see that Mutual Trust Bank Limited's overall financial position is insolvent and trend shows that performance is getting worse.

In 2009, Z-Score of One Bank Limited is 0.786361994 so that bank was performing poorly as this is less than 1.1 so bank's financial position was insolvent. From 2010 to 2014, One Bank Limited's performance was below 1.1 and that is declining trend of performance. On an average Z-Score value is 1.658249831, this is also stating the fact that the One Bank Limited was insolvent. From Table 14, we can see that One Bank Limited's overall financial position is insolvent and trend shows that performance is getting worse.

In 2009, Z-Score of Premier Bank Limited is 0.566145952 so that bank was performing poorly as this is less than 1.1 so bank's financial

Year	Z-Score	Indicator	Average
2009	5.824081263	Secure	<b>2.29114436</b>
2010	1.68190398	Healthy	
2011	2.065936981	Healthy	
2012	1.887564213	Healthy	
2013	1.251097364	Healthy	
2014	1.03628236	Insolvent	

Table 8: Data analysis of Basic Bank limited.

Year	Z-Score	Indicator	Average
2009	0.853929515	Insolvent	<b>0.364374669</b>
2010	-0.038248682	Insolvent	
2011	0.332854105	Insolvent	
2012	-0.018923182	Insolvent	
2013	0.613824369	Insolvent	
2014	0.442811891	Insolvent	

Table 11: Data analysis of Janata Bank limited.

Year	Z-Score	Indicator	Average
2009	1.153197804	Healthy	<b>2.329345782</b>
2010	0.790681447	Insolvent	
2011	0.974474574	Insolvent	
2012	1.613475164	Healthy	
2013	7.303866779	Secure	
2014	2.140378925	Healthy	

Table 9: Data analysis of Eastern Bank limited.

Year	Z-Score	Indicator	Average
2009	0.633749043	Insolvent	<b>0.284227138</b>
2010	-0.04099097	Insolvent	
2011	0.295482843	Insolvent	
2012	0.228788627	Insolvent	
2013	0.366022244	Insolvent	
2014	0.22231104	Insolvent	

Table 12: Data analysis of Mercantile Bank limited.

Year	Z-Score	Indicator	Average
2009	1.300918718	Healthy	<b>0.788318078</b>
2010	0.294460975	Insolvent	
2011	0.48758785	Insolvent	
2012	0.776261564	Insolvent	
2013	0.944799603	Insolvent	
2014	0.925879757	Insolvent	

Table 10: Data analysis of IFIC Bank limited.

Year	Z-Score	Indicator	Average
2009	0.857734615	Insolvent	<b>0.434647794</b>
2010	0.405209564	Insolvent	
2011	0.221274934	Insolvent	
2012	0.391701809	Insolvent	
2013	0.496142395	Insolvent	
2014	0.235823448	Insolvent	

Table 13: Data analysis of Mutual Trust Bank limited.

position was insolvent. From 2010 to 2014, Premier Bank Limited's performance was below 1.1 and that is declining trend of performance. On an average Z-Score value is 0.239339886, this is also stating the fact that the Premier Bank Limited was insolvent. From Table 15, we can see that Premier Bank Limited's overall financial position is insolvent and trend shows that performance is getting worse.

In 2009, Z-Score of Prime Bank Limited is 0.706791386 so that bank was performing poorly as this is less than 1.1 so bank's financial position was insolvent. From 2010 to 2014, Prime Bank Limited's performance was below 1.1 and that is declining trend of performance. On an average Z-Score value is 0.434565403, this is also stating the fact that the Prime Bank Limited was insolvent. From Table 16, we can see that Prime Bank Limited's overall financial position is insolvent and trend shows that performance is getting worse.

In 2009, Z-Score of Pubali Bank Limited is 0.640405829 so that bank was performing poorly as this is less than 1.1 so bank's financial position was insolvent. From 2010 to 2014, Pubali Bank Limited's performance was below 1.1 and that is declining trend of performance. On an average Z-Score value is 0.630899433, this is also stating the fact that the Pubali Bank Limited was insolvent. From Table 17, we can see that Pubali Bank Limited's overall financial position is insolvent and trend shows that performance is getting worse.

Year	Z-Score	Indicator	Average
2009	0.786361994	Insolvent	<b>0.636124015</b>
2010	0.763556365	Insolvent	
2011	0.804434889	Insolvent	
2012	0.755744723	Insolvent	
2013	0.333915303	Insolvent	
2014	0.372730818	Insolvent	

Table 14: Data analysis of One Bank limited.

Year	Z-Score	Indicator	Average
2009	0.566145952	Insolvent	<b>0.239339886</b>
2010	0.372788267	Insolvent	
2011	0.225097445	Insolvent	
2012	0.226028772	Insolvent	
2013	0.028946429	Insolvent	
2014	0.017032451	Insolvent	

Table 15: Data analysis of Premier Bank limited.

Year	Z-Score	Indicator	Average
2009	0.706791386	Insolvent	<b>0.434565403</b>
2010	0.214538365	Insolvent	
2011	0.419962411	Insolvent	
2012	0.436021111	Insolvent	
2013	0.461624627	Insolvent	
2014	0.36845452	Insolvent	

Table 16: Data analysis of Prime Bank limited.

Year	Z-Score	Indicator	Average
2009	0.640405829	Insolvent	<b>0.630899433</b>
2010	0.760551291	Insolvent	
2011	0.506470636	Insolvent	
2012	0.692683577	Insolvent	
2013	0.62797331	Insolvent	
2014	0.557311955	Insolvent	

Table 17: Data analysis of Pubali Bank limited.

In 2009, Z-Score of Rupali Bank Limited is 0.058272868 so that bank was performing poorly as this is less than 1.1 so bank's financial position was insolvent. In 2014, Rupali Bank Limited's financial position was healthy. From 2010 to 2013, Rupali Bank Limited's performance was below 1.1. On an average Z-Score value is 0.599435625, this is also stating the fact that the Rupali Bank Limited was insolvent. From Table 18, we can see that Rupali Bank Limited's overall financial position is insolvent and trend shows that performance is getting better.

In 2009, Z-Score of Shahjalamuslimi Bank Limited is 1.749143504 so that bank was performing good as this is greater than 1.1 so bank's financial position was healthy. From 2010 to 2014, Shahjalamuslimi Bank Limited's performance was greater than 1.1. On an average Z-Score value is 1.412860203, this is also stating the fact that the Shahjalamuslimi Bank Limited was healthy. From Table 19, we can see that Shahjalamuslimi Bank Limited's overall financial position is healthy.

In 2009, Z-Score of Social Islami Bank Limited is 1.590300694 so that bank was performing good as this is greater than 1.1 so bank's financial position was healthy. In 2010, Social Islami Bank Limited's financial position was insolvent. On an average Z-Score value is 1.199321565, this is also stating the fact that the financial position of Social Islami Bank Limited was healthy. From Table 20, we can see that Social Islami Bank Limited's overall financial position is healthy.

In 2009, Z-Score of Standard Bank Limited is 1.796279978 so that bank was performing good as this is greater than 1.1 so bank's financial position was healthy. In 2010, Standard Bank Limited's financial position was insolvent. From 2011 to 2014, Standard Bank Limited's performance was below 1.1 and that is declining trend of performance. On an average Z-Score value is 0.88747442, this is also stating the fact that the Standard Bank Limited was insolvent. From Table 21, we can see that Standard Bank Limited's overall financial position is insolvent and trend shows that performance is getting worse.

In 2009, Z-Score of South East Bank Limited is 1.090556628 so that

Year	Z-Score	Indicator	Average	
2009	0.058272868	Insolvent	<b>0.599435625</b>	
2010	0.275236565	Insolvent		
2011	0.384638674	Insolvent		
2012	0.848787637	Insolvent		
2013	0.91508542	Insolvent		
2014	1.11459259	Healthy		<b>Insolvent</b>

Table 18: Data analysis of Rupali Bank limited.

Year	Z-Score	Indicator	Average	
2009	1.749143504	Healthy	<b>1.412860203</b>	
2010	1.366876664	Healthy		
2011	1.327528111	Healthy		
2012	1.550718232	Healthy		
2013	1.34577502	Healthy		
2014	1.137119685	Healthy		<b>Healthy</b>

Table 19: Data analysis of Shahjala Islami Bank limited.

Year	Z-Score	Indicator	Average
2009	1.590300694	Healthy	<b>1.199321565</b>
2010	1.073512152	Insolvent	
2011	1.272193784	Healthy	
2012	1.260119769	Healthy	
2013	0.998814661	Insolvent	
2014	1.000988327	Healthy	

Table 20: Data analysis of Social Islami Bank limited.

bank was performing good as this is greater than 1.1 so bank's financial position was healthy. In 2010, South East Bank Limited's financial position was insolvent. From 2011 to 2014, South East Bank Limited's performance was below 1.1 and that is declining trend of performance. On an average Z-Score value is 10.889008076, this is also stating the fact that the South East Bank Limited was insolvent. From Table 22, we can see that South East Bank Limited's overall financial position is insolvent and trend shows that performance is getting worse.

In 2009, Z-Score of Trust Bank Limited is 1.48206737 so that bank was performing good as this is greater than 1.1 so bank's financial position was healthy. In 2010, Trust Bank Limited's financial position was insolvent. From 2013 to 2014, Trust Bank Limited's performance was below 1.1 and that is declining trend of performance. On an average Z-Score value is 0.916365639, this is also stating the fact that the Trust Bank Limited was insolvent. From Table 23, we can see that Trust Bank Limited's overall financial position is insolvent.

In 2009, Z-Score of The City Bank Limited is 2.220814453 so that bank was performing good as this is greater than 1.1 so bank's financial position was healthy. In 2010, The City Bank Limited's financial position was insolvent. From 2011 to 2014, The City Bank Limited's performance was below 1.1 and that is declining trend of performance. On an average Z-Score value is 0.87299446, this is also stating the fact that the financial position of The City Bank Limited was insolvent. From Table 24, we can see that The City Bank Limited's overall financial position is insolvent and trend shows that performance is getting worse.

In 2009, Z-Score of United Commercial Bank Limited is 0.781932915 so that bank was performing poorly as this is less than 1.1 so bank's financial position was insolvent. In 2010 United Commercial Bank Limited's financial position was insolvent. From 2011 to 2014, United Commercial Bank Limited's performance was below 1.1 and that is declining trend of performance. On an average Z-Score value is 0.685883956, this is also stating the fact that the financial position of

United Commercial Bank Limited was insolvent. From Table 25, we can see that United Commercial Bank Limited's overall financial position is insolvent and trend shows that performance is getting worse.

In 2009, Z-Score of Islami Bank Limited is 7.129397337 so that bank was performing good as this is greater than 2.6 so bank's financial position was Secure. In 2010, Islami Bank Limited's financial position was insolvent. From 2011 to 2014 Islami Bank Limited's performance was below 1.1 and that is declining trend of performance. On an average Z-Score value is 1.800897889, this is also stating the fact that the financial position of Islami Bank Limited was healthy. From Table 26, we can see that Islami Bank Limited's overall financial position is healthy and trend shows that performance is getting worse.

In 2009, Z-Score of EXIM Bank Limited is 1.164116124 so that bank was performing good as this is greater than 1.1 so bank's financial position was healthy. In 2011, EXIM Bank Limited's financial position was secure. On an average Z-Score value is 1.793443355, this is also stating the fact that the financial position of EXIM Bank Limited was healthy. From Table 27, we can see that EXIM Bank Limited's overall financial position is healthy.

In 2009, Z-Score of ICB Islami Bank Limited is -0.0075826 so that bank was performing poorly as this is less than 1.1 so bank's financial position was insolvent. In 2010, ICB Islami Bank Limited's financial position was insolvent. From 2011 to 2014 ICB ISLAMI Bank Limited's

Year	Z-Score	Indicator	Average
2009	1.796279978	Healthy	<b>0.88747442</b>
2010	0.592112559	Insolvent	
2011	0.732562673	Insolvent	
2012	0.884250629	Insolvent	
2013	0.782236726	Insolvent	
2014	0.537403958	Insolvent	

Table 21: Data analysis of Standard Bank limited.

Year	Z-Score	Indicator	Average
2009	1.090556628	Healthy	<b>0.889008076</b>
2010	0.849597337	Insolvent	
2011	0.672516914	Insolvent	
2012	0.981172769	Insolvent	
2013	0.881130829	Insolvent	
2014	0.859073981	Insolvent	

Table 22: Data analysis of South East Bank limited.

Year	Z-Score	Indicator	Average
2009	1.48206737	Healthy	<b>0.916365639</b>
2010	0.634523868	Insolvent	
2011	1.097505114	Insolvent	
2012	1.324424294	Healthy	
2013	0.570335631	Insolvent	
2014	0.389337558	Insolvent	

Table 23: Data analysis of Trust Bank limited.

Year	Z-Score	Indicator	Average
2009	2.220814453	Healthy	<b>0.87299446</b>
2010	0.205350775	Insolvent	
2011	0.708555943	Insolvent	
2012	0.514108175	Insolvent	
2013	0.86043952	Insolvent	
2014	0.728697891		

Table 24: Data analysis of The City Bank limited.

Year	Z-Score	Indicator	Average
2009	0.781932915	Insolvent	<b>0.685883956</b>
2010	0.296402526	Insolvent	
2011	0.843486952	Insolvent	
2012	0.946095679	Insolvent	
2013	0.790134743	Insolvent	
2014	0.457250922	Insolvent	

Table 25: Data analysis of United Commercial Bank limited.

Year	Z-Score	Indicator	Average
2009	7.129397337	Secure	<b>1.800897889</b>
2010	0.712007674	Insolvent	
2011	0.842267254	Insolvent	
2012	0.820851464	Insolvent	
2013	0.632854304	Insolvent	
2014	0.668009303	Insolvent	

Table 26: Data analysis of Islami Bank limited.

Year	Z-Score	Indicator	Average
2009	1.164116124	Healthy	<b>1.793443355</b>
2010	0.750045444	Insolvent	
2011	5.181350825	Secure	
2012	1.404541155	Healthy	
2013	1.288380016	Healthy	
2014	0.972226567	Insolvent	

Table 27: Data analysis of Exim Bank limited.

performance was below 1.1 and that is declining trend of performance. On an average Z-Score value is -1.126189731, this is also stating the fact that the financial position of ICB Islami Bank Limited was insolvent. From Table 28, we can see that ICB Islami Bank Limited's overall financial position is insolvent also negative and trend shows that performance is getting worse.

In 2009, Z-Score of First Security Islami Bank Limited is 0.989124679 so that bank was performing poorly as this is less than 1.1 so bank's financial position was insolvent. In 2010, First Security Islami Bank Limited's financial position was insolvent. On an average Z-Score value is 0.997654317, this is also stating the fact that the financial position of First Security Islami Bank Limited was insolvent. From Table 29, we can see that First Security Islami Bank Limited's overall financial position is insolvent and trend shows that performance is getting worse.

In 2009, Z-Score of Uttara Bank Limited is -0.599078531 so that bank was performing poorly as this is less than 1.1 so bank's financial position was insolvent. In 2010, Uttara Bank Limited's financial position was insolvent. On an average Z-Score value is -0.751652157, this is also stating the fact that the financial position of Uttara Bank Limited was insolvent. From Table 29, we can see that Uttara Bank Limited's overall financial position is insolvent and trend shows that performance is getting worse.

The failure in Gray area, bankruptcy cannot easily be predicted so all year data shows that all banks are insolvent. The score indicates a high probability of distress within this time period. From Figure 1, we can see that on average Basic Bank, Eastern Bank, Islami Bank and EXIM Bank Limited's performance comparatively better than other banks. As all banks use their fixed Liability (Fixed Deposit) as working capital most of them have negative working capital. Uttara Bank and ICB Islami Bank have negative financial performance.

Based on the level of mean, the condition of banks is not good because here highest mean is T2 between T1-T4. Median is affective to protect bankruptcy because the level of median is 0.757624466 that is lower number then proper number of standard. Minimum Z score is -3.353078608 and average Z-Score is 0.79913588 and it shows that all sample banks are insolvent during the time period. Standard Deviation of Z-score is comparatively higher than T1, T2, T3 and T4 (Table 30).

Correlation of T1 with Z is 0.688157 and it is positive hence the null hypothesis is rejected and alternate hypothesis is accepted. Also correlation of T2 with Z, T3 with Z and T4 with Z are positive so null

hypothesis is rejected and alternate hypothesis is accepted (Figure 2). So all null hypothesis will be rejected and all alternate hypothesis will be accepted (Table 31).

From Table 32, it can be found that coefficient of T1=6.56, T2=3.26, T3=6.72 and T4=1.05 and Constant C=-5.75E-10. As R<sup>2</sup>=100%, all independent variable together explain the dependent variable. As a result all alternate hypothesis will be accepted and all null hypothesis will be rejected. Here, Significance level is 0.01 and our Probability (F-Statistics) is 0 (Table 33). So Significance level is 0.01 greater than

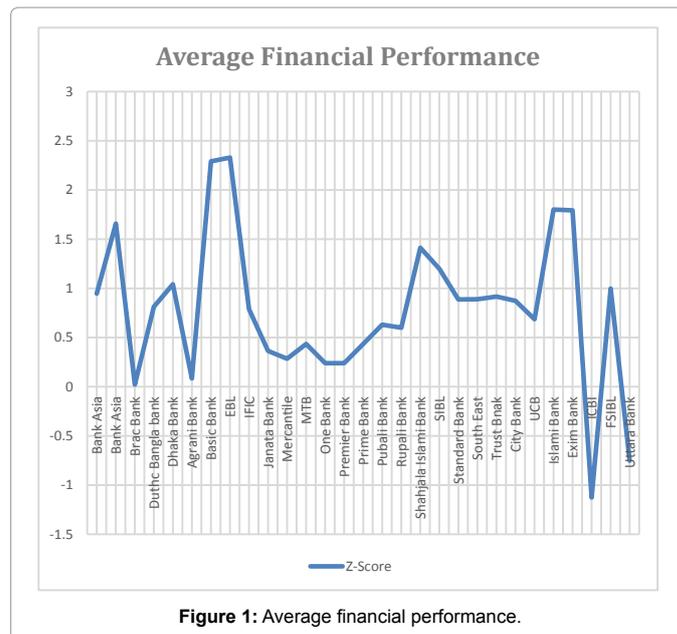


Figure 1: Average financial performance.

Year	Z-Score	Indicator	Average
2009	-0.599078531	Insolvent	<b>-0.751652157</b>
2010	-0.782417352	Insolvent	
2011	-0.327403766	Insolvent	
2012	-0.721857246	Insolvent	
2013	-1.028852892	Insolvent	
2014	-1.050303155	Insolvent	<b>Insolvent</b>

Table 30: Data analysis of Uttara Bank limited.

Year	Z-Score	Indicator	Average
2009	-0.0075826	Insolvent	<b>-1.126189731</b>
2010	-2.258630792	Insolvent	
2011	-3.008525749	Insolvent	
2012	-3.353078608	Insolvent	
2013	0.944799603	Insolvent	
2014	0.925879757	Insolvent	<b>Insolvent</b>

Table 28: Data analysis of ICB Islami Bank limited.

Year	Z-Score	Indicator	Average
2009	0.989124679	Insolvent	<b>0.997654317</b>
2010	0.4542641	Insolvent	
2011	1.002467048	Insolvent	
2012	1.296142167	Healthy	
2013	1.381026755	Healthy	
2014	0.862901154	Insolvent	<b>Insolvent</b>

Table 29: Data analysis of First Security Islami Bank limited.

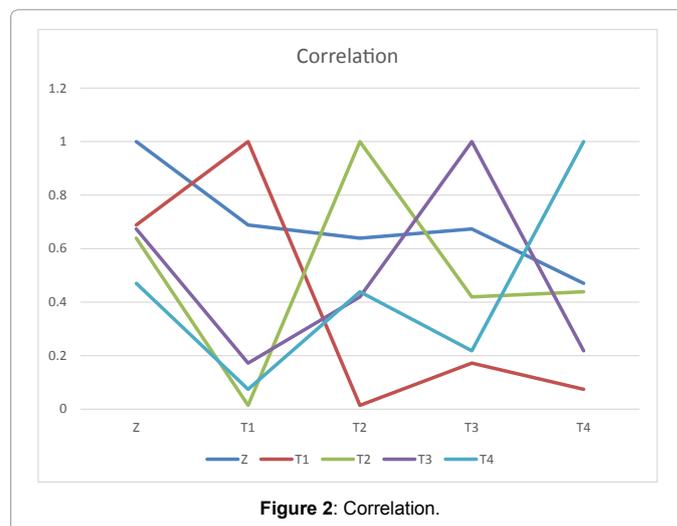


Figure 2: Correlation.

	Z	T1	T2	T3	T4
<b>Mean</b>	0.79913588	0.011474992	0.01186953	0.083804399	0.116190192
<b>Median</b>	0.757624466	0.007265134	0.00964133	0.079863541	0.089687656
<b>Maximum</b>	7.303866779	0.999496369	1	0.667849565	1.13207154
<b>Minimum</b>	-3.353078608	-0.249722417	-1.05443415	-0.080724046	-0.364242531
<b>Std. Dev.</b>	1.187709592	0.109992254	0.147218575	0.064100823	0.191040839

Table 31: Descriptive Statistics.

	Z	T1	T2	T3	T4
<b>Z</b>	1	0.688157	0.638977	0.673559	0.470427
<b>T1</b>	0.688157	1	0.014205	0.171937	0.074284
<b>T2</b>	0.638977	0.014205	1	0.419615	0.438622
<b>T3</b>	0.673559	0.171937	0.419615	1	0.218286
<b>T4</b>	0.470427	0.074284	0.438622	0.218286	1

Table 32: Correlation.

Variable		Std. Error	t-Statistic	Prob.
<b>C</b>	-5.75E-10	3.78E-10	-1.52114	0.130094
<b>T1</b>	6.56	1.92E-09	3.42E+09	0
<b>T2</b>	3.26	1.69E-09	1.93E+09	0
<b>T3</b>	6.72	3.61E-09	1.86E+09	0
<b>T4</b>	1.05	1.21E-09	8.69E+08	0

Table 33: Regression.

the Probability (F-Statistics), as a result all alternate hypothesis will be accepted and all null hypothesis will be rejected. And the model is good fit (Table 34).

## Significance of the Study

The aim of this research was to analyse the financial performance of Bangladeshi banks using statistical analysis of summary financial information and selected financial ratios. Here are some significant finding of this research:

- Here, R2=100%, all independent variable together explain the dependent variable. As a result all alternate hypothesis will be accepted and all null hypothesis will be rejected.
- Significance level is 0.01 greater than the Probability (F-Statistics), as a result all alternate hypothesis will be accepted and all null hypothesis will be rejected.
- Correlations of T1, T2, T3 and T4 with Z are positive so null hypothesis is rejected and alternate hypothesis is accepted.
- Based on the level of mean, the condition of banks is not good because here highest mean is T2 between T1- T4.
- Median is affective to protect bankruptcy because the level of median is lower number then proper number of standard.
- Based on minimum Z score and average Z-Score they show that financial position of 22 banks are insolvent and 7 banks are healthy during the time period.
- Standard Deviation of Z-score is comparatively higher than T1, T2, T3 and T4.
- Some banks have negative working capital, so they cannot liquidate day to day business. But banks cover that liquidity by using long-term Liability (Fixed Deposited).
- Most of banks have low equity than liability. Because they are taking more deposit than loans.

<b>R-squared</b>	1	Mean dependent var	0.799136
<b>Adjusted R-squared</b>	1	S.D. dependent var	1.18771
<b>S.E. of regression</b>	2.72E-09	<b>Log likelihood</b>	3187.484
<b>Sum squared resid</b>	1.25E-15	<b>F-statistic</b>	8.26E+18
<b>Prob(F-statistic)</b>	0		

Table 34: Alternate Hypothesis.

In all testes all the null hypothesis are rejected, so we can say that there is a relationship between the independent variables and the dependent variable.

## Conclusion

The financial sector of Bangladesh is mostly small and developing. This sector resides of banking and an emerging capital market. The banking sector in the country comparatively more developed than the equity market, even though both are developing in international benchmark (Table 34). The basic reasons of the Bangladeshi financial sector barriers are lack of market discipline due to lack of rivalry in the banking industry. Excessive government involvement and political influences, economic and political corruptions, operational and managerial disorganization and incompetence result vicious cycle. For this reasons we are far away from economic development, industrialization, and social progress [30]. From this research it is found that most of Islamic Banks are doing well than other banks. Their Z-Score is better comparing to standard. Most of the state-owned bank used to follow the traditional working procedures few years ago. But our state owned banks are now doing better than before for adopting of IT. By managing working capital and credit risk all Banks will do better in Future. Those banks that have negative Z-Score they should take some immediate steps to reduce doubt about their going concern. So after this research with sample size of 29 banks, it can be easily understand that on an average all rivalry banks are doing better and soon they will overcome their existing problems.

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