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Determinants of the Financial Health of Non-Bank Financial Institutions in Bangladesh USING Altman's Z-Score Model

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Abstract

Non-banking Financial Institutions (NBFI) are growing very fast in Bangladesh after their first establishment in 1981. Due to some recent unwanted and vulnerable events, it is important to determine the financial health condition of NBFIs. The main focus of this study is to determine the financial health condition of NBFIs in Bangladesh using Altman's Z''-Score Model and the impact of different financial ratios on the calculated Z''-Score. A data set is considered for a 5-year (2015-2019) period for 21 NBFIs in Bangladesh. The study result shows that presently more than 80% of NBFIs are in financially distressed conditions. As per the best-fitted regression model, 'Random Effect Model', among the different financial ratios, Non-performing Loans (NPL) and Deposit Ratios (DR) are the most impactful and negatively related to the company's financial distress condition. It is recommended to strongly control the non-performing loan and mobilize the deposit efficiently for better financial health.

Keywords: Z''-Score, Cost to Income Ratio (CIR), Deposit Ratio (DR), Non-Performing Loan (NPL), Loan Ratio (LR), NBFI.
JEL Classification: G17, G23, G32, G33

1. Introduction

1.1 Background of the Study

Following independence, Bangladesh's banking sector began with six domestic commercial banks, three state-owned banks, and nine international banks. The banking industry expanded significantly in 1980, when private banks started their operations in Bangladesh. In 1981, Non-bank Financial Institutions (NBFI) started their journey in Bangladesh. The Financial Institution Act of 1993 regulates non-bank financial institutions, which are governed by the Central Bank. 34 Financial Institutions (FIs) are working at present. Out of the total, two are wholly owned by the government, fifteen were started through private domestic initiative, fifteen through joint venture initiative, and one is a subsidiary of a state-controlled commercial bank. Term deposits, call money,

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bonds, securitization, and credit facilities from banks and other Fis make up the majority of the sources of funding for financial institutions.

Banks and NBFIs differ from one another in significant ways. NBFIs are prohibited from issuing pay orders, cheques, or demand drafts, participating in foreign exchange financing, or accepting demand deposits under Bangladesh Bank regulations. On the other hand, NBFIs are able to carry out private equity placements, securitization instruments, lease financing, syndicated financing bridge financing, and more (Bangladesh Bank, n.d.).

In Bangladesh, NBFIs constitute an important part of the nation's financial system. NBFIs fulfill the limitations of bank financing by providing diversified financial investments across the country. Moreover, NBFIs enhance the growth of the economy by providing additional facilities offered by commercial banks, and NBFIs play a positive role in the health of the capital market (Sufian, 2007).

In terms of profitability, some NBFIs are doing well and some are not. For example, more than 85% of NBFIs are in distress, considering 15 NBFIs from 2011 to 2015 (Tania and Farzana, 2016). The media make it clear that People's Leasing and Financial Services Limited (PLFSL) and International Lesing and Financial Services Limited (ILFSL) have been put into liquidation. PLFSL and Bangladesh Industrial Finance Company Limited (BIFC) are nearly same.

2. Literature Review, Research Objectives and Hypothesis

2.1 Literature Review

The Altman Z''-Score Model investigation of the financial health of Bangladesh's NBFIs found that 15 of the country's total of 23 NBFIs are in financial trouble. Some NBFIs have a good reputation nationally and internationally, but according to Z''-Score model, their financial health is not up to par (Hamid et al., 2016). This study does not provide an analysis of why NBFIs are in distress or which factors are affecting most of the Z''-Score value. This study recommends that Bangladesh Bank should regulate these distressed NBFIs for financial health improvement, but how it can be done or whether Bangladesh Bank should focus on which factors is not mentioned here.

A study on the financial distress analysis of private commercial banks in Bangladesh found that only 24% of the 25 selected commercial banks are in a safe zone (Mostofa et al., 2016). It is observed that the ratio of earnings before interest and taxes (EBTI) to total assets is the most impactful variable considering the other three required variables to calculate the Z''-Score. The mean Z''-Score has been shown in this paper, which does not carry any significant importance for the study results. The authors of this article stated that the excess disbursement of non-performing loans is reducing operating profit. But the article does not contain proper analysis regarding this statement.

It is observed that day by day, the number of distressed non-banking financial institutions in Bangladesh is increasing. As independent variables, return on assets and return on equity have been taken into account. On the other hand, as dependent variables, Altman's Z''-Score and leverage have been taken. After the analysis, it was found that Z''-Score has a positive relationship with a company's portability (Jahan and Kabir, 2019). The author used the generalized least squares (GLS) method rather than the ordinary least squares (OLS) regression method as there was heteroscedasticity present in the data set. This study also recommended taking the necessary steps to increase the company's Z''-Score. But there is no clear recommendation on which factor the company's management should focus on to increase the Z''-Score.

A study on measuring the financial distress of NBFIs in Bangladesh using Altman's Z-score model found that in 2018, about 90% of NBFIs were in distressed condition, whereas it was 100% in 2016 of 20 selected NBFIs (Rahman et al., 2020). Besides this analysis, the authors also showed the different category lists of NBFIs in Bangladesh according to the Dhaka Stock Exchange (DSE). Thirteen NBFIs fall under category "A," which is able to hold annual general meetings and declare dividends each fiscal year. Four NBFIs fall under category "B," which can still hold annual general meetings even though they didn't report the required minimum dividend. Three NBFIs fall under category 'Z' which failed to declare dividends and was also not able to organize an annual general meeting. The authors recommended enhancing credit policy, managing non-performing loans, managerial skills, and resource shortages. The

analysis of the impact of these factors on the Z''-score value is missing in this paper.

A comparison between private commercial banks and state-owned commercial banks found that there is a huge difference in Z''-Score value between them, and state-owned banks outperform private commercial banks in terms of financial soundness (Parvin and Rahman, 2016). A t-test has been done to identify the result. Z''-Score will be different from bank to bank and from year to year, as Z''-Score depends on about seven different variables. Seven variables from different banks in different years cannot occur at the same time. The author chose only six commercial banks out of forty-eight. Only 12.5% of commercial bank data has been considered for this study.

Research was done about the usefulness of the Altman Z''-Score model in determining the level of financial distress of Bangladesh Industrial Finance Company (BIFC), and People's Leasing and Financial Services (PLFS). It was found that the Altman Z''-Score model is usable to forecast financial distress (Azim and Sharif, 2020). PLFSL is now in the liquidation process among the 34 NBFIs in Bangladesh. In Bangladesh, only PLFSL is in the liquidation stage. One single set of data cannot provide a concrete decision about the relationship between liquidation and the Z''-Score for NBFI in Bangladesh. The authors showed the mean of current assets, total assets, current liabilities, total liabilities, retained earnings, and book value of two companies. This does not play any significant role in the article's decision-making process.

Full-length research on the financial health of 27 leasing companies in India was done by Z''-Score analysis, and it was found that about 48% of leasing companies fall into the grey and distress zones and 52% fall into the safe zone (Jaisheela, 2015). The study recommended reviewing companies' policies for the improvement of their financial health without specifying which policies should be revised.

Based on research of sixty-nine non-financial firms from the Stock-Exchange of Karachi from 2012-2017, it is found that Altman Z-Score and size of the firm have shown a positive relationship to the financial performance indicators

(ROA and ROE), whereas leverage is inversely related to financial performance (Mushafiq et al., 2021). The Z-Score-Scoreken as a credit risk indicator in this research.

A study was done on thirty-two commercial banks in Indonesia to identify the relationship between non-performing loans as the dependent variable, return on assets (ROA) as an independent variable, loan-to-deposit ratio as an independent variable, and cost-to-income ratio as an independent variable. The study found that cost-to-income ratio and non-performing loans have a negative and large impact on return on assets, whereas the loan-to-deposit ratio has a positive and considerable impact (Dewi and Badjra, 2020). To obtain the regression coefficient the author used a multiple linear regression analysis model; later on, he did an autocorrelation test, a heteroscedasticity test, and other relevant tests to verify the model.

As per the study of 84 listed non-financial companies on the Kuala Lumpur, Malaysia, Stock Exchange, it was found that 52 companies are at high risk and 32 are considered low risk (Hiong et al., 2021). The experiment is done through Altman's Z-score model. Applying this model, one can identify the strengths and weaknesses of a company, which will help investors make the right decision. Though what factors are involved in the strength or weakness of a company are not shown in this research, more in-depth impact factor analysis can provide more insight for investors to observe the company's health.

After studying numerous relevant published papers, it was observed that most of the studies tried to show the current financial health condition of different financial organizations in different countries. But the impact of different financial ratios on Z''-Score is still unknown. After calculating the Z''-Score, this study will help determine the impact of different financial ratios on the calculated Z''-Score. As a result, financial organizations can take steps to improve their financial health by improving the impactful financial ratio's value.

The Altman Z-Score is a well-known distress prediction model (Altman and Danovi, 2013). This model was formulated in 1968. 33 healthy and 33 bankrupt

American manufacturing enterprises made up the model's initial application. The model was accurate enough to be 95% accurate. The Z-Score model had five indicators (Altman, 1968). During the following year, this model was further developed into a new Z''-Score model (Altman, 1995) with four indicators. The updated Altman Z''-Score Model can be used by manufacturing firms operating in underdeveloped nations as well as non-manufacturing sectors. Based on the score, there are three classification areas: 'safe', 'grey' and 'distress'.

In most cases, Return on Assets (ROA) and Return on Equity (ROE) are used to measure profitability or financial performance. Return on equity is inversely correlated with non-performing loans, deposit ratios, and cost-to-income ratios, whereas return on equity is positively correlated with loan ratios. (Imtiaz et al., 2019). In another study, it was also found that Z''-Score is positively related to a company's performance (Jahan and Kabir, 2019).

The pooled Ordinary Least Squares (OLS) regression model is a simple regression model, as this model disregards the space and time dimensions of the pooled data. Due to its simplicity, the pooled regression model may misrepresent the relationship between dependent and independent variables. Panel data that combines time series of cross-sectional observations provides more efficient data that is more informative, more variable, less collinear with other variables, and more degrees of freedom. (Gujarati, 2004, p. 637). The fixed effect model introduced more complexity and precision than the OLS model. Regarding the fixed effect model for panel data analysis, there are various presumptions. The intercept of each individual is a time variant in the fixed effect model. In a fixed-effect model, it is assumed that the regressors' coefficients are constant throughout time and between individuals. On the other hand, the random effect model differs in many ways from the fixed effect model. The error component in the random effect model shows how each individual intercept deviates from the mean value, and the intercept constant denotes the mean value of all the cross-sectional intercepts (Gujarati, 2004, p. 648).

2.2 Research Objectives

The goal of this study was to determine the financial health and effects of various financial metrics on various NBFIs in Bangladesh. This study also tried to find the impact of financial parameters like Income Ratio (CIR), Loan Ratio (LR), Deposit Ratio (DR), and Non-performing Loan Ratio (NPL) on the financial health of NBFIs.

2.3 Research Problems and Justification

According to some recent unrest events involving NBFIs in Bangladesh, it is crucial to know the financial health condition of NBFIs for stakeholders. It is also important to find out the correlation between financial parameters and financial health conditions. Improvement of these factors will lead to a sustainable health condition for NBFIs. It might be that some NBFIs are not concentrating on important financial rations, which can lead them into difficult situations. From the different literature reviews, it is observed that proper data analysis is missing before providing improvement statements. So, this paper will help to provide a concrete financial condition improvement scope through rigorous data analysis by different regression models.

2.4 Hypothesis

Non-performing Loans (NPL), Deposit Ratios (DR), and Cost-to-income Ratios (CIR) are inversely related to NBFI's financial health distress score (Z''-Score), while the Loan Ratio (LR) is positively related to financial health distress score (Z''-Score).

Here is the explanation of the hypothesis:

Independent variables: NPL, DR, CIR, and LR

Dependent variable: financial health distress score (Z''-Score)

Relationship: Inverse relationship between NPL, DR, and CIR and Z''-Score; positive relationship between LR and Z''-Score.

The inverse relationship means that as the value of NPL, DR, or CIR increases, the value of Z''-Score decreases. The positive relationship means that as the

value of LR increases, the value of Z''-Score increases. We are also considering that the financial health of most of the NBFIs in Bangladesh is in distressed condition.

3. Research Methodology

3.1 Data and Sample

Required data for this paper have been collected from secondary data sources. Data for this paper has been collected from published and audited annual reports of different NBFIs in Bangladesh. Annual reports are audited and publicly available, so the data set is authentic and reliable. All information is collected from open source, and there is no ethical violation in this paper.

Data has been taken from different NBFIs in Bangladesh. Due to the unavailability of required annual reports and required data, 13 NBFIs have been excluded from the data set. Data have been taken for a five-year span from 2015 to 2019. This is the most recent data, as most of the companies do not publish annual reports for 2020.

The values of current asset, current liability, total asset, total liability, retained earnings, earnings before interest and taxes, market value of equity, total deposit, total operating income, total operating expenses, unclassified loan, classified loan, and total loan have been manually collected from 105 annual audited reports of 21 NBFIs in Bangladesh from 2015 to 2019.

Microsoft Excel Spreadsheet Software has been used for determining the Z''-Score from the previously defined data. For regression analysis, software for statistics and data science, STATA (Version-14), has been used.

3.2 Analysis Method

To calculate the value of the Z''-Score four ratios have been taken as per the model. Later on, four different financial ratios have been taken as independent variables, and the calculated Z''-Score has been taken as a dependent variable.

3.2.1 Calculation of the Z''-Score

Altman's Z''-Score model will help to categorize financial institutions into 'safe zone, 'grey zone' and 'distress zone' according to their financial health condition. Z''-Score calculated by working capital, retained earnings, earnings before interest and taxes (EBTI), book value, total assets, and total liabilities. Different four ratios are the main components used to calculate the Z''-Score.

For non-manufactures, the Altman Z''-Score Model is:

$$Z'' = 6.56X_1 + 3.26X_2 + 6.72X_3 + 1.05X_4$$

X_1, X_2, X_3, X_4 variables defining and zone distribution are given in table 01:

Table 1: Variable Definition and Zone Interpretation

Variables	
X_1 = Working capital/total asset	
X_2 = Retained Earnings/Total Assets	
X_3 = Earnings before Interest and Taxes (EBTI)/Total Assets	
X_4 = Market Value of Equity/Total Liabilities	
Zone Defining According to Altman's Z''-Score Model	
Zone	**Z''-Score**
Safe Zone	Z''-Score>2.6
Grey Zone	1.1<Z''-Score<2.6
Distress Zone	Z''-Score<1.1

Source: Altman, Danovi and Falini (2013)

All the four ratios X1 (working capital/total assets), X2 (retained earnings/total assets), X3 (earnings before interest and taxes (EBTI)/total assets), and X4 (market value of equity/total liabilities) are necessary to calculate the Z''-Score value. A higher Z''-Score leads to a better financial health condition for a company. A lower Z''-Score leads to a financially distressed company. A short description of different variables and ratios can be found in Table-2:

Table-2: Short Description of Different Variables and Ratios to Determine Z''-Score

Variable Name	Description
Working capital	Working capital is the result of subtracting current assets from current liabilities. It is a measure of liquidity of a company.
Total Assets	The total asset is the sum of the short-term and long-term assets of a company.
Total Liabilities	Liability is an obligation that must eventually be paid, and it is a claim on assets.
Retained Earnings	Retained earnings are the amount carried forward into the coming years from net earnings.
Earnings before interest and taxes	Earnings before Interest and Taxes (EBTI) shows the operating profit or operating earnings of a financial organization. It is calculated from the balance sheet as earnings before tax and the provision.
Market Value of Equity of Book Value	This is the total market value of shareholders' equity.
X_1 = Working capital/total asset	The working capital and total assets ratios are symbols of a bank's liquidity and ability to meet creditors short-term obligations.
X_2 = Retained earnings/total assets	Accumulated Retained Earnings to Total Assets (TA) is the ratio that denotes the reinvestment capacity that can be explained by this ratio. A positive ratio indicates the company's financial solvency.
X_3 = Operating earnings/total assets	By using this ratio, the efficiency of using the company's total assets can be measured. This ratio indicates the capacity of the firm to generate a satisfactory level of earnings to pay off its fixed obligations, like interest.
X_4 = Market value of equity/total liabilities	This ratio indicated the condition of the market value of the bank's stock in comparison to its total liabilities. The higher the ratio, the higher the market price of the firm's share is.

3.2.2 Statical Model

There are lots of factors or ratios to define the different statuses of a financial organization. Randomly, four financial ratios have been taken as independent variables for the regression analysis. The four ratios are the cost-to-Income Ratio (CIR), Deposit Ratio (DR), Non-performing Loan (NPL), and Loan Ratio (LR). A short description of different financial ratios considered independent variables can be found in Table-3:

Table 3: Short Description of Financial Ratios considered Independent Variables

Ratios Name	Description
Cost-to-Income Ratio (CIR)	This is the ratio of total operating costs to total operating income of a firm at a certain year. It measures the operating efficiency of a bank.
Deposit Ratio (DR)	The ratio of the total deposit to the total asset is the deposit ratio. The profitability of a firm can be impacted if it fails to transform its deposits into loans efficiently.
Non-performing Loan (NPL)	NPL can be derived from the ratio of the total classified loan amount to the total loan amount. If a loan does not generate income for a certain period, then that loan will be called a classified loan.
Loan Ratio (LR)	The loan ratio can be calculated by dividing the total loan amount by the total asset. A loan generates income for a financial organization. More loans in the asset portfolio are expected to generate more income for the firm.

The regression model to test the hypothesis has been chosen and is given below:

$$Z''\text{-}Score = \beta_0 + \beta_1\, CIR + \beta_2 DR + \beta_3 NPL + \beta_4 LR + \varepsilon$$

Considered Z''-Score as a dependent variable and CIR (cost-to-income ratio), DR (deposit ratio), NPL (non-performing loan), and LR (loan ratio) as independent variables. Here 'β_0', 'β_1', 'β_2', 'β_3' and 'β_4' are coefficients to be estimated, and 'ε' is the error component.

3.2.3 Regression Models, Diagnostic, and Robustness Test

An Ordinary Least Squares (OLS) regression model has been run, considering Z''-Score as the dependent variable and CIR, DR, NPL, and LR as the independent variables. For panel data sets, better results cannot be expected from the OLS regression model as the OLS model cannot differentiate the data set values for different companies for different years. For better results, a fixed effect regression model is applied for panel data regression analysis.

The Generalized Least Squares (GLS) random effect regression model was applied for regression analysis along with the fixed effect model. Later on, the

Hausman Specification Test is done to find the best-suited model between the fixed effect model and the random effect model.

Macro panels with extensive time series typically experience issues with cross-sectional dependence and serial correlation. For a microdata set with a few years of data, this is not much of a problem (Baltagi, 2005, p. 199). The data set is for 21 NBFIs over a period of 5 years. This data set is a microdata set. General diagnostic tests for cross-sectional dependence in panel data were also performed.

To obtain heteroskedasticity-robust standard errors, the Huber-White robust standard error model has been run.

A Breusch-Pagan Lagrange Multiplier (LM) test has been run for the random effect model to determine the best-fitted model between random effect regression and simple OLS regression.

4. Result Analysis

4.1 Estimation of Z''-Score and Financial Health

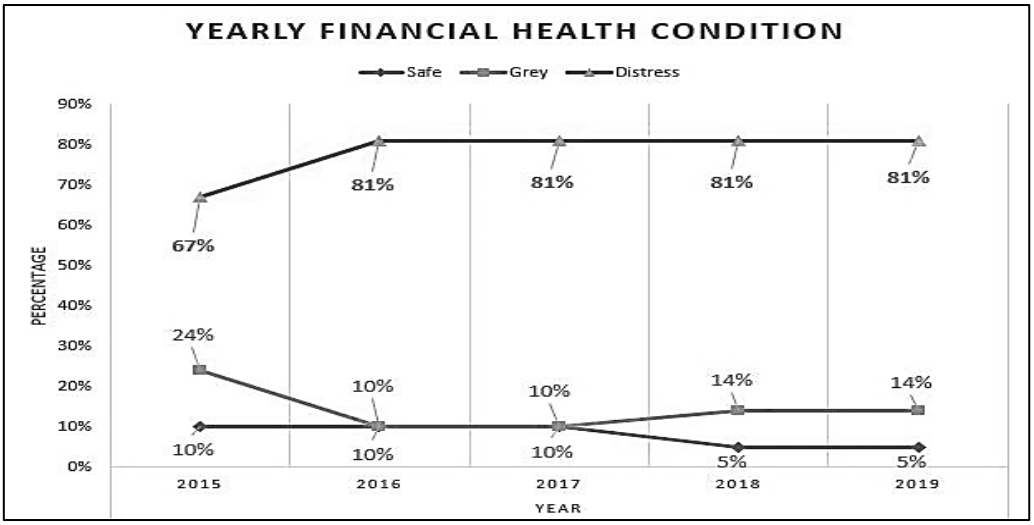
The collected data has been used for determining the Z''-Score for 21 NBFIs of Bangladesh during the years 2015 to 2019 by the Altman Z''-Score Model. After the calculation, it is found that most of the companies are in a financially distressed condition according to the Altman Z''-Score Model. In the year 2015, only 10% of NBFIs were in the 'safe' zone, 24% were in the 'grey' zone and 67% were in the financially distressed zone. In the years 2016 and 2017, only 10% of NBFIs were in the 'safe' zone, 10% were in the 'grey' zone and 81% were in the financially distressed zone. The percentage of NBFIs in a distressed zone has increased since 2015. In the years 2018 and 2019, only 5% of NBFIs were in the 'safe' zone, 14% were in the 'grey' zone and 81% were in the financially distressed zone. Table-formatted result data can be found in Table-4 and graphical analysis can be found in Figure-1:

Table 4: Bangladeshi NBFI Performance Analysis Yearly by Number of Institutions

Zone Type	Year									
	2015		2016		2017		2018		2019	
	No.	%	No.	%	No.	%	No.	%	No.	%
Safe	2	10%	2	10%	2	10%	1	5%	1	5%
Grey	5	24%	2	10%	2	10%	3	14%	3	14%
Distress	14	67%	17	81%	17	81%	17	81%	17	81%
Total	21	100%	21	100%	21	100%	21	100%	21	100%

Source: Constructed by the Author Based on Data from the Annual Reports of Sample Companies

Figure 1: Graphical Performance Analysis of Bangladeshi NBFIs Yearly by Number of Institutions



It is observed that the financial condition of NBFIs is not good at all. It will be very difficult to protect against financial shocks for most in the NBFIs in Bangladesh. After the year 2015, financial conditions have fallen, and financial distress is constant for 81% of NBFIs.

4.2 Regression Analysis

According to the correlation matrix (Table-5), there is no significant correlation between the dependent variable (Z''-Score) and the independent variables (CIR, DR, NPL, and LR). The correlation between DR and Z''-Score is 0.59, but it is considerable.

Table 5: Correlation Matrix between Dependent Variables and Independent Variables

Variables	Z	CIR	DR	NPL	LR
Z''-Score	1				
CIR	-0.0531	1			
DR	-0.5914	0.1238	1		
NPL	-0.3789	0.0427	-0.1018	1	
LR	-0.2105	-0.4263	0.1351	-0.0163	1

A graphic representation of the histogram analysis of all the variables can be found in Figure-2. It is observed that LR and CIR are mostly concentrated at a single point, whereas Z''-Score, NPL, and DR are distributed along the whole axis.

From the Table-6, we can see the mean value, standard deviation, minimum value, and maximum value of Z''-score, the Cost-to-income Ratio (CIR), Deposit Ratio (DR), Non-performing Loan Ratio (NPL), and Loan Ratio (LR). It is observed that the cost-to-income ratio has the highest standard deviation among all five variables. The minimum value of the cost-to-income ratio is -272.0132, and the maximum value is 343.609. The standard deviation for the Z''-Score is 2.49712, with a minimum value of -6.892535 and a maximum value of 14.64688. Detail is in Table-6.

Figure 2: Density Histogram of Different Variables

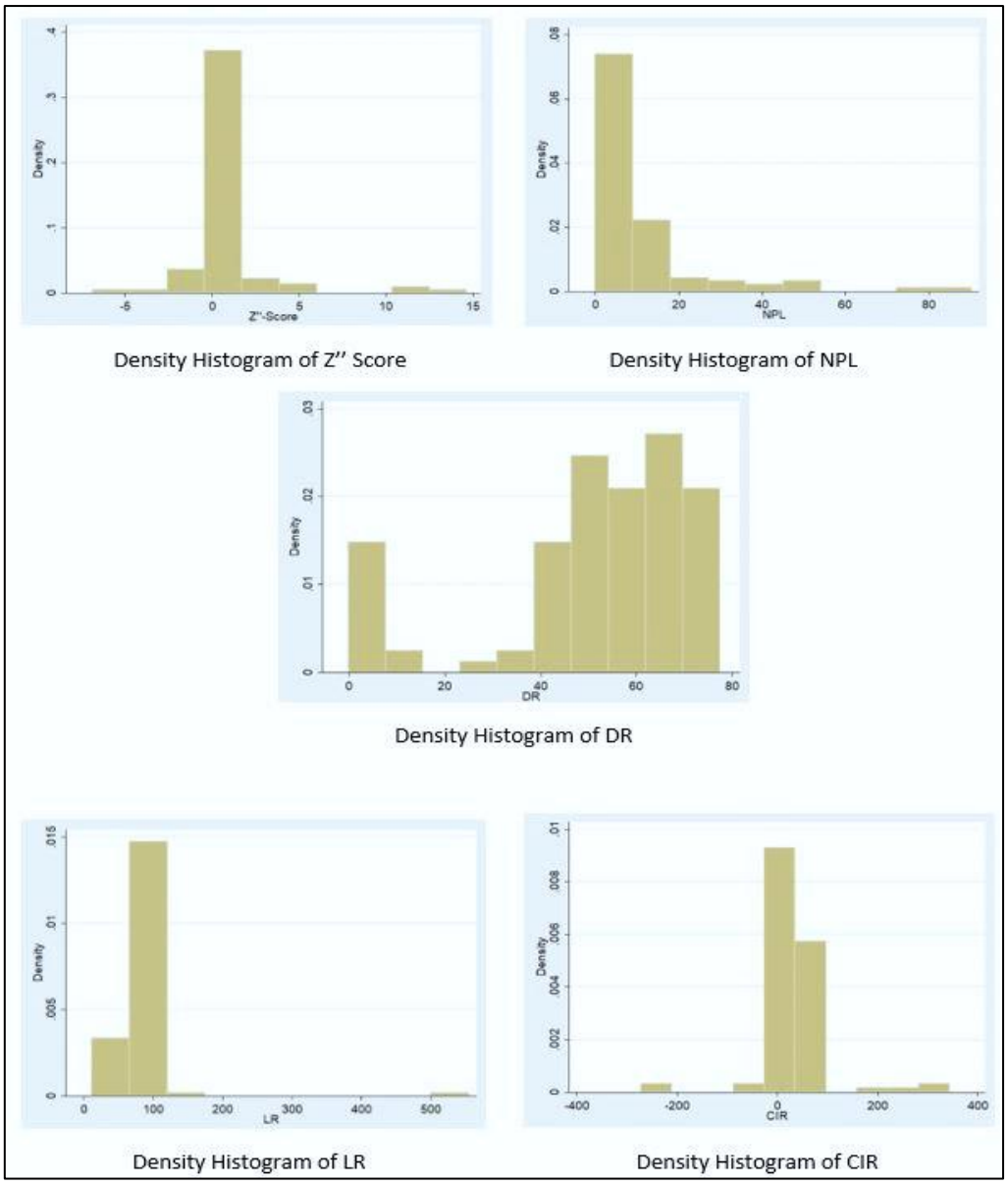


Table 6: Summary of Considered Variables

Variable	Number of Obs.	Mean Value	Standard Deviation	Minimum Value	Maximum Value
Z''-Score	105	0.8710803	2.49712	-6.892535	14.64688
CIR	105	33.89917	64.49843	-272.0132	343.609
DR	105	51.06828	21.96885	0	77.39772
NPL	105	10.70025	14.60343	0	90.30875
LR	105	79.47931	48.79453	11.74533	555.6018

The test results of Ordinary Least Square (OLS) can be found in Table-7.

Table 7: OLS Regression Model Analysis Result

Variables	Coefficient	Standard Error	t stat (t)	P value (P>|t|)
CIR	-0.0007315	.002896	-0.25	0.801
DR	-0.0698958	.0077956	-8.97	0.000
NPL	-0.0757577	.0113896	-6.65	0.000
LR	-0.0073024	.0038277	-1.91	0.059
Constant	5.856352	.5192345	11.28	0.000
	SS	Df	MS	Number of Observations = 105
Model	364.848499	4	91.2121247	
Residual	283.654852	100	2.83654852	
Total	648.503351	104	6.23560914	
F (4,100) = 32.16		Prob > F = 0.0000		
R-squared = 0.5626		Adj. R-squared = 0.5451		

As per the OLS regression model analysis, it is observed that all the independent variables are negatively related to the Z''-Score. DR and NPL are providing significant value at a 5% level, whereas CIR and LR are not significant in this model.

The data set used for this study is a combination of cross-sectional data and time-series. So, the data set is a panel data set. In STATA, the data set is defined as a panel data set, and it is found that the data set is strongly balanced. Details in Table-8.

Table 8: Panel Data Status

Panel Variable	Company (strongly balanced)
Time Variable	Year, 2015-2019

Findings of the fixed effect regression model are given below in Table 9:

Table 9: Fixed Effect Regression Model Result

Dependent Variable	**Z''-Score**	**Coefficient**	**Std. Error**	**P>|t|**
Independent Variables	CIR	0.0006765	0.0022393	0.763
	DR	-0.0346336	0.0143332	0.018
	NPL	-0.0572119	0.0110577	0.000
	LR	-0.0017127	0.0030753	0.579
Prob > F = 0.0000; number of obs. = 105, number of groups = 21				

In the model, Z''-Score is negatively related to Deposit Ratio (DR), non-Performing Loan (NPL) and Loan Ratio (LR) and positively related to Cost-to-Income Ratio (CIR). But the relation of the Z''-Score with CIR and LR is insignificant as the probability is greater than 5%. The relation between DR and NPL and the Z''-Score is significant at 5%. Z''-Score is negatively related to deposit ratio and non-performing loans.

The findings of the random effect model can be found in Table-10.

Table 10: GLS Random Effect Regression Model Result

Dependent Variable	Z''-Score	Coefficient	Std. Error	P>|Z|
Independent Variables	CIR	-0.0002326	0.0022253	0.917
	DR	-0.0566766	0.0102259	0.000
	NPL	-0.0657647	0.0103367	0.000
	LR	-0.0034239	0.0030484	0.261
Prob > chi2 = 0.0000; Number of obs. = 105, Number of groups = 21				

In the model, Z''-Score is negatively related to Cost-to-income ratio (CIR), Deposit Ratio (DR), Non-performing Loan (NPL), and Loan Ratio (LR). But the relation of the Z''-Score with CIR and LR is insignificant as the probability is greater than 5%. The relationship between DR and NPL and the Z''-Score is significant at 5%. The Z''-Score is negatively related to deposit ratios and non-performing loans.

Later on, the Hausman Specification Test is done to find the best-suited model. The detailed result of the Hausman Specification Test is given below in Table-11.

Table 11: Hausman Specification Test Result

	Coefficients		Difference (b-B)	Sqrt (diag (V_b-V_B)) S.E.
	Fixed (b)	Random (B)		
CIR	.0006765	-.0002326	.0009091	.0002497
DR	-.0346336	-.0566766	.022043	.0100436
NPL	-.0572119	-.0657647	.0085528	.0039277
LR	-.0017127	-.0034239	.0017112	.0004055
Chi2(4) = 2.36		Null Hypothesis: Random Effect Model is appropriate; Alt. Hypothesis: Fixed Effect Model is appropriate		
Prob>chi2=0.6701				

The Hausman Specification Test accepts the null hypothesis as long as the probability is greater than 5%. The Hausman Specification Test recommends that the random effect regression model is best suited for the regression analysis with this panel data set. The cross-sectional dependence test has been done.

The result of cross-sectional dependence can be found in Table-12.

Table 12: Test Results of Cross-sectional Dependence

Pesaran's test of cross-sectional independence = 0.287	Null Hypothesis: There is no cross-sectional dependence;
Pr = 0.7741	Alt. Hypothesis: There is cross-sectional dependence.

The probability is more than 5%, so the null hypothesis is accepted. There is no cross-sectional dependence in the panel data set.

According to the result of the Huber-White robust standard error model, it is found that Cost-to-income Ratio (CIR) and Loan Ratio (LR) are negatively related to Z''-Score but these variables are not significant. Deposit Ratio (DR) and Non-performing Loan (NPL) are also negatively related to Z''-Score and they are also significant at the 5% level. There is a similarity between this robust variance estimation result and the random effect model result. The detailed results can be found in Table-13.

Table 13: Robust Variance Estimation

Dependent Variable	**Z''-Score**	**Coefficient**	**Robust Std Err.**	**P>|Z|**
Independent Variables	CIR	-0.0002326	0.0017976	0.897
	DR	-0.0566766	0.0245096	0.021
	NPL	-0.0657647	0.0125835	0.000
	LR	-0.0034239	0.0030406	0.260
Prob > chi2 = 0.0000				
Number of obs. = 105, number of groups = 21.				

The null hypothesis for the Breusch-Pagan Lagrange Multiplier (LM) test is that there is no significant difference in units (no panel effect on the data set). From the finding, it is observed that the test result rejects the null hypothesis as the probability is less than 5%. It proves that the random effect model is more appropriate than simple OLS regression. Detailed results can be found in Table-14.

Table 14: Breusch-Pagan Lagrange Multiplier (LM) Test

	Var	Sd = sqrt (VAR)
Z''-Score	6.235609	2.49712
E	1.349315	1.1616
U	1.383659	1.176291
Chibar2 (01) = 45.27	Null Hypothesis: There is no significant difference in units (no panel effect); Alt. Hypothesis: There is a significant difference in units (panel effect).	
Prob > chibar2 = 0.0000		

5. Discussion of the Results

According to the data analysis, most of the NBFIs are in distressed condition. It might be difficult for them to protect themselves if any financial shock happens in the near future. A higher Z''-Score means higher financial stability.

The data set used for this study is a strongly balanced panel data set, so an acceptable model for regression analysis is a fixed effect model or random effect model rather than OLS regression model. As per the Hausman test, it is observed that the random effect model is more appropriate for this analysis than the fixed effect model. As per the result of the random effect model regression analysis, it is found that all four independent variables (CIR, DR, NPL, and LR) are negatively related to the Z''-Score. Though CIR and LR are not significant, a negative coefficient suggests a reduction in the cost-to-income ratio, and the loan ratio might improve the financial condition. As per the histogram chart (Figure-2), it is observed that CIR and LR are mostly concentrated at a point where Z''-Score is diversified. This might be a reason for its insignificant value. Whereas NPL and DR show diversification at the histogram (Figure-2) and also provide significant value.

A non-performing loan is negatively related to a bank's profitability (Dewi, 2020). As per the analysis, it is also showing that higher NPL and higher DR are negatively related to the financial distress condition.

6. Conclusion

6.1 Conclusion and Recommendation

This study attempted to find the financial health conditions of different NBFIs in Bangladesh and the impact of different financial parameters on their financial health. It has been found that most of the NBFIs are financially distressed. 67% of NBFIs from the selected data were in a financially distressed zone in 2015. In 2016, 2017, 2018, and 2019, it increased to 81%. This is alarming for the financial sector. It will be very difficult to protect against financial shocks for most of the NBFIs in Bangladesh. This study also tried to find the impact of financial parameters on Z''-Score. It is observed that, as per the model, the Cost-to-income Ratio (CIR) and Loan Ratio (LR) have no significant impact on financial health. Whereas Deposit Ratio (DR) and Non-performing Loan Ratio (NPL) are negatively related to Z''-Score. Where the non-performing loan is the most impactful parameter for the Z''-Score. A deposit is the liability of a financial company. If a financial organization cannot efficiently convert its deposit amount to loan amount, then that deposit will be a burden, and financial distress may occur for that company. For financial institutions, one of the main income sources is the loan's interest. If a loan fails to make interest, then the company will face a financial crisis. A non-performing loan is not making interest for the company, and as a result, it is in a distressed condition. This is in compliance with the relationship between the non-performing loan and financial organizations' profitability. So, it is strongly recommended that financial organizations focus mostly on reducing non-performing loans and mobilizing deposits efficiently.

Through this research analysis, financial organizations can perform better by observing and controlling the different important financial ratios. This study makes contribution by expanding the application of Altman's Z''-Score model regarding NBFIs in Bangladesh. NBFIs in Bangladesh may benefit from using the Z''-Score model to evaluate their financial standing, according to the study's findings. The research's offers fresh perspectives on the factors that influence the financial stability of NBFIs in Bangladesh. These results may help Bangladeshi NBFIs strengthen their financial situation. They can also be helpful

for regulators and decision-makers to create regulations that support the NBFIs' financial stability.

6.2 Research Limitations

Data from all 34 NBFIs over a longer period of time can produce a more accurate result. Increasing different financial variables will help to determine the relationship of the Z''-Score with other financial variables. Altman's Z''-Score is for the non-manufacturing industry of developing countries. If the Z''-Score model can be modified only for the financial organization, then a better result can be expected.

6.3 Study Scope

The same model can be run for the commercial banks of Bangladesh and other countries, whether it follow the same recommendations or not.

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Appendices

Appendix Table 1: Calculation of Z''-Score and Zone Distribution

No	Company Name	Year	X1 = Working Capital / Total Asset	X2 = Retained Earning / Total Asset	X3 = EBTI / Total Asset	X4 = Book Value / Total Liability	Z''-Score = 6.56 X1 + 3.26 X2 + 6.72 X3 + 1.05 X4	Zone
1	IDLC Finance Limited	2019	0.0247	0.0231	0.0208	0.1086	0.4916	Distress
		2018	(0.0068)	0.0241	0.0231	0.1171	0.3120	Distress
		2017	0.0005	0.0258	0.0285	0.1288	0.4141	Distress
		2016	0.0232	0.0295	0.0337	0.1104	0.5907	Distress
		2015	(0.2103)	0.0235	0.0358	0.1036	(0.9534)	Distress
2	MIDAS Financing Ltd	2019	0.0090	0.0116	0.0120	0.1618	0.3474	Distress
		2018	0.0138	0.0032	0.0027	0.1376	0.2639	Distress
		2017	0.0279	0.0125	0.0219	0.1362	0.5142	Distress
		2016	(0.4180)	(0.0121)	0.0338	0.1207	(2.4277)	Distress
		2015	0.1192	(0.0723)	0.0051	0.1515	0.7403	Distress
3	United Finance Limited	2019	(0.0375)	0.0091	0.0177	0.1712	0.0826	Distress
		2018	(0.0170)	0.0079	0.0197	0.1489	0.2024	Distress
		2017	0.0413	0.0086	0.0171	0.1444	0.5650	Distress
		2016	0.0256	0.0124	0.0226	0.1654	0.5339	Distress
		2015	0.0082	0.0122	0.0270	1.1618	1.4949	Gray
4	Bangladesh Infrastructure Finance Fund Limited	2019	0.3127	0.0285	0.0563	2.2049	4.8377	Safe
		2018	0.2927	0.0224	0.0613	3.4166	5.9920	Safe
		2017	0.6483	0.0252	0.0590	7.1247	12.2127	Safe
		2016	0.7165	0.0265	0.0592	9.0115	14.6469	Safe
		2015	0.7003	0.0340	0.0720	5.8302	11.3106	Safe
5	Delta Brac Housing Finance Corporation	2019	0.0484	0.0084	0.0239	0.1086	0.6198	Distress
		2018	(0.4092)	0.0075	0.0261	0.0961	(2.3836)	Distress
		2017	(0.0687)	0.0076	0.0251	0.0868	(0.1665)	Distress
		2016	(0.0449)	0.0048	0.0147	0.0838	(0.0921)	Distress
		2015	(0.0354)	0.0101	0.0353	0.0975	0.1407	Distress
6	Lanka Bangla Finance Limited	2019	0.0159	0.0267	0.0108	0.1448	0.4160	Distress
		2018	0.0506	0.0285	0.0101	0.1263	0.6253	Distress
		2017	0.0122	0.0313	0.0179	0.1024	0.4097	Distress
		2016	0.0702	0.0382	0.0192	0.1199	0.8401	Distress
		2015	0.0413	0.0463	0.0234	0.1394	0.7260	Distress

No	Company Name	Year	X1 = Working Capital / Total Asset	X2 = Retained Earning / Total Asset	X3 = EBTI / Total Asset	X4 = Book Value / Total Liability	Z''-Score = 6.56 X1 + 3.26 X2 + 6.72 X3 + 1.05 X4	Zone
7	IPDC Finance Limited	2019	0.0171	0.0104	0.0184	0.0948	0.3688	Distress
		2018	0.0167	0.0107	0.0222	0.0802	0.3785	Distress
		2017	0.0038	0.0139	0.0171	0.0860	0.2754	Distress
		2016	0.0022	0.0255	0.0222	0.1401	0.3941	Distress
		2015	0.0835	0.0714	0.0544	0.4321	1.5992	Gray
8	Infrastructure Development Company Ltd.	2019	0.2836	0.0204	0.0442	0.1012	2.3299	Gray
		2018	0.2813	0.0097	0.0346	0.0901	2.2040	Gray
		2017	0.4350	0.0104	0.0370	0.0895	3.2299	Safe
		2016	0.4556	0.0133	0.0378	0.0890	3.3796	Safe
		2015	0.5646	0.0223	0.0425	0.0916	4.1580	Safe
9	International Leasing and Financial Services Limited	2019	(0.5088)	(0.6236)	(0.1701)	(0.3606)	(6.8925)	Distress
		2018	(0.2929)	0.0034	0.0106	0.0647	(1.7708)	Distress
		2017	0.0139	0.0062	0.0138	0.0631	0.2705	Distress
		2016	0.0101	0.0003	0.0117	0.0681	0.2178	Distress
		2015	0.0066	0.0043	0.0172	0.1071	0.2855	Distress
No	Company Name	Year	X1 = Working Capital / Total Asset	X2 = Retained Earning / Total Asset	X3 = EBTI / Total Asset	X4 = Book Value / Total Liability	Z''-Score = 6.56 X1 + 3.26 X2 + 6.72 X3 + 1.05 X4	Zone
10	National Housing Finance and Investments Limited	2019	(0.0768)	0.0114	0.0216	0.1157	(0.2003)	Distress
		2018	0.0486	0.0116	0.0245	0.0924	0.6182	Distress
		2017	0.0228	0.0139	0.0293	0.1176	0.5155	Distress
		2016	0.0500	0.0174	0.0385	0.1542	0.8047	Distress
		2015	0.1182	0.0225	0.0453	0.2171	1.3812	Gray
11	First Finance Limited	2019	(0.0065)	(0.0545)	(0.0229)	0.1118	(0.2575)	Distress
		2018	(0.2727)	(0.0580)	(0.0354)	0.0835	(2.1281)	Distress
		2017	0.0052	(0.0204)	(0.0141)	0.1194	(0.0015)	Distress
		2016	0.0037	0.0062	0.0130	0.1793	0.3199	Distress
		2015	0.0215	0.0022	0.0175	0.1641	0.4380	Distress
12	Bangladesh Finance Limited	2019	0.0401	0.0218	0.0195	0.1969	0.6720	Distress
		2018	0.0625	0.0204	0.0185	0.1630	0.7718	Distress
		2017	0.0590	0.0152	0.0283	0.1372	0.7709	Distress
		2016	0.0069	0.0109	0.0245	0.1293	0.3811	Distress
		2015	0.0087	0.0082	0.0181	0.1182	0.3291	Distress

No	Company Name	Year	X1 = Working Capital / Total Asset	X2 = Retained Earning / Total Asset	X3 = EBTI / Total Asset	X4 = Book Value / Total Liability	Z''-Score = 6.56 X1 + 3.26 X2 + 6.72 X3 + 1.05 X4	Zone
13	National Finance Limited	2019	0.0622	0.0059	0.0056	0.2700	0.7483	Distress
		2018	0.0359	0.0103	0.0328	0.2125	0.7126	Distress
		2017	0.0766	0.0090	0.0317	0.1950	0.9497	Distress
		2016	0.0975	0.0083	0.0421	0.2279	1.1888	Gray
		2015	0.0426	0.0145	0.0456	0.2131	0.8569	Distress
		Year	X1 = Working Capital / Total Asset	X2 = Retained Earning / Total Asset	X3 = EBTI / Total Asset	X4 = Book Value / Total Liability	Z''-Score = 6.56 X1 + 3.26 X2 + 6.72 X3 + 1.05 X4	Zone
14	Prime Finance & Investment Ltd.	2019	0.0603	(0.1151)	0.0031	0.3425	0.4008	Distress
		2018	0.0038	(0.1073)	(0.0069)	0.2952	(0.0618)	Distress
		2017	(0.0280)	(0.0904)	(0.0231)	0.2233	(0.3989)	Distress
		2016	(0.0887)	(0.0578)	(0.0356)	0.2344	(0.7632)	Distress
		2015	(0.1853)	(0.0222)	(0.0225)	0.2475	(1.1792)	Distress
15	Premier Leasing & Finance Ltd.	2019	0.0111	0.0051	0.0041	0.1427	0.2666	Distress
		2018	0.1140	0.0076	0.0103	0.1384	0.9873	Distress
		2017	0.0100	0.0133	0.0148	0.1052	0.3188	Distress
		2016	0.0466	(0.0750)	(0.0188)	0.0169	(0.0475)	Distress
		2015	0.0524	0.0006	0.0065	0.1062	0.5003	Distress
16	Fas Finance & Investment Ltd.	2019	(0.4641)	(0.0750)	(0.0188)	0.0169	(3.3979)	Distress
		2018	0.0054	0.0006	0.0065	0.1062	0.1921	Distress
		2017	0.0032	0.0109	0.0131	0.1157	0.2658	Distress
		2016	(0.1455)	0.0086	0.0138	0.1152	(0.7128)	Distress
		2015	0.0117	0.0113	0.0113	0.1411	0.3374	Distress
17	Islamic Finance and Investment Limited	2019	0.0830	0.0091	0.0226	0.1335	0.8663	Distress
		2018	0.0837	0.0116	0.0227	0.1329	0.8790	Distress
		2017	0.0787	0.0128	0.0158	0.1440	0.8149	Distress
		2016	0.0633	0.0170	0.0325	0.1673	0.8650	Distress
		2015	0.0620	0.0172	0.0317	0.2067	0.8929	Distress
18	Bay Leasing & Investment Ltd.	2019	0.0572	0.0115	0.0166	0.2340	0.7703	Distress
		2018	0.0378	0.0110	0.0202	0.1982	0.6271	Distress
		2017	0.0124	0.0094	0.0166	0.2143	0.4485	Distress
		2016	0.0049	0.0093	0.0157	0.2812	0.4630	Distress
		2015	0.0069	0.0074	0.0194	0.5199	0.7461	Distress

No	Company Name	Year	X1 = Working Capital / Total Asset	X2 = Retained Earning / Total Asset	X3 = EBTI / Total Asset	X4 = Book Value / Total Liability	Z''-Score = 6.56 X1 + 3.26 X2 + 6.72 X3 + 1.05 X4	Zone
19	Uttara Finance and Investments Limited	2019	0.0888	0.0220	0.0457	0.2275	1.1998	Gray
		2018	0.1862	0.0170	0.0582	0.2006	1.8785	Gray
		2017	0.1405	0.0076	0.0486	0.1924	1.4751	Gray
		2016	(0.0216)	0.0064	0.0449	0.2323	0.4248	Distress
		2015	0.0857	0.0051	0.0492	0.2072	1.1272	Gray
20	Phoenix Finance & Investments Limited	2019	0.0074	0.0103	0.0179	0.1208	0.3296	Distress
		2018	0.0029	0.0084	0.0267	0.1053	0.3364	Distress
		2017	0.0245	0.0080	0.0268	0.0903	0.4614	Distress
		2016	0.0040	0.0102	0.0279	0.1173	0.3706	Distress
		2015	0.0030	0.0124	0.0340	0.1440	0.4394	Distress
21	GSP Finance Company (Bangladesh) Limited	2019	0.0933	0.0156	0.0569	0.4276	1.4934	Gray
		2018	0.0542	0.0247	0.0582	0.4303	1.2791	Gray
		2017	0.0706	0.0249	0.0596	0.3517	1.3139	Gray
		2016	0.0592	0.0286	0.0672	0.4475	1.4032	Gray
		2015	0.0623	0.0266	0.0517	0.3818	1.2440	Gray

Appendix Table 2: Ratios for Regression Analysis

No	Company Name	Year	Cost to Income Ratio (CIR) = Total Operating Expenses / Total Operating Income	Deposit Ratio (DR) = Total Deposit / Total Asset	Non-performing Loan (NPL) = Classified Loan / Total Loan	Loan Ratio (LR) = Total Loan/Total Asset
1	IDLC Finance Limited	2019	41.77674	69.33732	3.065832	79.7598
		2018	40.66033	70.15772	2.201108	78.34972
		2017	40.28452	8.675407	2.765667	76.30373
		2016	37.86656	9.271492	2.975133	79.91057
		2015	35.18843	66.54761	3.058105	75.04345
2	MIDAS Financing Ltd	2019	57.88946	56.43618	9.923025	86.05983
		2018	63.32734	62.58768	12.48665	86.20838
		2017	35.33007	66.52413	9.921254	86.34885
		2016	45.35316	65.12633	11.9663	84.87592
		2015	66.51112	52.23181	25.59685	79.72301
3	United Finance Limited	2019	57.08496	56.77945	4.252186	65.7084
		2018	49.19892	63.01584	2.955807	74.53468
		2017	52.47815	65.19108	2.979427	70.83021
		2016	47.67616	63.14832	3.793098	66.76146
		2015	41.94584	61.58078	5.051112	61.62059
4	Bangladesh Infrastructure Finance Fund Limited	2019	7.566658	1.460188	1.3841	54.75436
		2018	7.771857	0	0.030194	56.31332
		2017	7.623678	0	0	41.51324
		2016	6.499816	0	0	31.88819
		2015	2.252156	0	0	31.1661
5	Delta Brac Housing Finance Corporation	2019	26.9746	73.231	0.452841	75.1045
		2018	24.81783	75.33824	0.302799	76.25822
		2017	24.7089	75.46216	0.272246	77.39592
		2016	22.9038	74.01053	0.362695	77.11869
		2015	19.38716	69.2234	0.299765	81.95997

No	Company Name	Year	Cost to Income Ratio (CIR) = Total Operating Expenses / Total Operating Income	Deposit Ratio (DR) = Total Deposit / Total Asset	Non-performing Loan (NPL) = Classified Loan / Total Loan	Loan Ratio (LR) = Total Loan/Total Asset
6	Lanka Bangla Finance Limited	2019	54.32589	59.2247	5.58536	76.61199
		2018	57.50609	66.22916	3.603455	79.07035
		2017	49.86395	66.04056	3.067761	79.12522
		2016	51.34529	69.67503	3.524438	81.13012
		2015	46.0066	67.68198	3.718005	80.73335
7	IPDC Finance Limited	2019	45.31171	71.98734	1.568752	78.76417
		2018	40.09617	73.38193	2.137944	87.75339
		2017	45.99012	75.71306	0.620507	87.72686
		2016	40.38369	76.09173	0.705873	86.28533
		2015	30.28152	55.40945	1.979215	78.22195
8	Infrastructure Development Company Ltd.	2019	11.82188	0	4.544729	75.70653
		2018	9.763201	0	7.149121	73.81235
		2017	7.629727	0	10.91493	54.85238
		2016	7.035799	0	9.450185	56.16562
		2015	6.004138	0	1.580238	57.60081
9	International Leasing and Financial Services Limited	2019	-2.53318	61.31492	90.30875	86.39427
		2018	31.17944	64.29108	4.557169	82.42145
		2017	28.12259	66.47785	4.71053	80.20741
		2016	27.544	61.73073	4.689468	83.76165
		2015	23.37425	60.39115	7.349593	85.6075
10	National Housing Finance and Investments Limited	2019	33.22451	72.61933	5.211315	73.98628
		2018	24.91497	76.97017	4.253851	58.92976
		2017	24.28244	72.18971	5.121168	63.38679
		2016	21.91031	69.20294	4.947131	73.13867
		2015	18.18037	62.91703	5.611517	82.84994

No	Company Name	Year	Cost to Income Ratio (CIR) = Total Operating Expenses / Total Operating Income	Deposit Ratio (DR) = Total Deposit / Total Asset	Non-performing Loan (NPL) = Classified Loan / Total Loan	Loan Ratio (LR) = Total Loan/Total Asset
11	First Finance Limited	2019	343.609	59.54075	36.57573	87.09391
		2018	-218.703	61.62298	47.60484	78.91118
		2017	311.7597	53.26793	32.17633	80.6087
		2016	73.73764	53.6455	35.46291	88.57602
		2015	51.65045	61.31549	40.41139	82.51505
12	Bangladesh Finance Limited	2019	46.01312	51.4909	4.844363	76.58438
		2018	45.68559	51.1757	4.417213	72.81193
		2017	32.06057	52.75703	6.084469	72.51518
		2016	32.03172	50.10112	7.831066	77.20537
		2015	29.66595	60.04692	4.508147	82.05384
13	National Finance Limited	2019	78.85822	42.3576	23.46368	77.04406
		2018	27.4441	45.42232	16.18839	81.86461
		2017	24.75123	51.34889	14.86646	76.91778
		2016	19.63322	54.0794	13.70512	76.73028
		2015	19.33014	57.71689	5.902596	79.76772
14	Prime Finance & Investment Ltd.	2019	84.26146	43.35607	15.94392	58.96183
		2018	166.8422	47.35392	17.11602	60.45414
		2017	-272.013	52.05151	1.40123	555.6018
		2016	-75.3059	47.66942	12.03522	68.44423
		2015	220.6261	54.28268	10.20238	70.20306
15	Premier Leasing & Finance Ltd.	2019	63.09886	49.20154	29.61247	74.02669
		2018	40.78715	50.7553	25.62668	74.76639
		2017	28.56303	54.49144	9.761074	75.25783
		2016	31.92655	55.2979	9.279364	86.60871
		2015	18.32519	55.63345	9.042567	78.0991

No	Company Name	Year	Cost to Income Ratio (CIR) = Operating Cost / Operating Income	Deposit Ratio (DR) = Total Deposit / Total Asset	Non-performing Loan (NPL) = Classified Loan / Total Loan	Loan Ratio (LR) = Total Loan/Total Asset
16	Fas Finance & Investment Ltd.	2019	-51.9052	44.14917	73.1508	88.44544
		2018	52.75854	44.60922	15.21047	81.76462
		2017	35.79451	47.89543	11.67228	76.46599
		2016	32.37182	48.06667	9.990056	80.89735
		2015	20.35433	53.09333	7.29651	84.99734
17	Islamic Finance and Investment Limited	2019	38.75708	76.42299	4.569785	72.21073
		2018	35.00071	77.39772	3.808713	69.97571
		2017	50.08629	73.48174	5.751972	68.90188
		2016	42.59747	66.82511	4.514562	76.00537
		2015	38.434	65.6991	10.34335	64.45107
18	Bay Leasing & Investment Ltd.	2019	28.84624	7.700514	52.22568	122.955
		2018	22.5358	5.915262	50.7761	11.74533
		2017	25.93642	41.70598	8.39624	64.41456
		2016	27.39259	40.37126	8.703734	65.3214
		2015	23.75333	37.70197	6.434678	64.89846
19	Uttara Finance and Investments Limited	2019	13.74657	44.54417	6.697348	72.61467
		2018	8.987579	43.69824	10.63256	81.40755
		2017	11.89315	40.73218	6.422603	73.29624
		2016	14.43953	50.86483	7.926786	71.27357
		2015	40.49135	46.52876	8.240841	68.72027
20	Phoenix Finance & Investments Limited	2019	45.92379	66.3036	7.059362	90.98335
		2018	30.00815	68.69488	5.771769	90.18214
		2017	27.52271	64.86102	4.941475	91.74537
		2016	31.67249	67.38864	3.75773	88.30006
		2015	30.99259	69.86028	2.792457	85.01253
21	GSP Finance Company (Bangladesh) Limited	2019	11.91704	29.73227	18.91358	76.70764
		2018	10.71582	32.4651	8.146315	76.67337
		2017	9.950646	41.93219	8.536979	81.01766
		2016	10.43393	45.35582	7.292264	75.45524
		2015	16.72038	47.3133	6.478739	75.10812

Data collected manually from annual reports