

Determinants of Non-Performing Loans in Bangladesh: An Empirical Study on the Banks Listed in Dhaka Stock Exchange

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ABSTRACT: *The purpose of the paper is to determine factors that affect non-performing loans in the banking sector of Bangladesh. To determine the factors, there is an experiment of finding relationship of bank specific variables- return on assets (ROA), percentage change in loan, loan to asset ratio and three macroeconomic indicators- GDP growth rate, rate of unemployment and average annual inflation rate with the non-performing loans in Bangladesh. Several diagnostic tests like hypothesis testing, multiple regression model, and unit root test, hausman test, heteroscedasticity test, random effect and fixed effect model in the fifth section have been tested on listed banks of Dhaka Stock Exchange Limited to identify the nature of variables on non-performing loans. According to the analysis, return on asset, loan to asset ratio and GDP growth rate are the significant variables to explain the dependent variable (non-performing loan). The result of the analysis recommends that every bank should emphasize on macroeconomic & microeconomic variables at the time of distributing loan for decreasing the level of non-performing loans.*

Keywords: *Bank-specific variables, Non-performing loans, Macroeconomic variables, Banking sector.*

1. INTRODUCTION

Banks are financial intermediaries that work as depository institutions. They maintain deposits and make loans. Every loan has a repayment schedule which comprises of repayment of principal and interest. A loan becomes non-performing when the borrower is unable to pay the scheduled payments for a specified period. A non-performing loan is

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considered as default or close to default. When the size of non-performing loan increases, the financial condition of the banking sector weakens because it lessens its ability to earn profit, improve capital base and repay depositors. As a result, the entire banking sector jeopardizes through bank failures and liquidity crisis. To ensure financial soundness, financial intermediaries must minimize their non-performing loans. The percentage of non-performing loan (NPL) is increasing day by day which has been considered as the alarming condition for the Bangladesh. As of June 2019, gross NPL added up to Taka 893.4 billion (\$10.8 billion). It was 9.32 percent of total outstanding loans. Non-performing loans are main reason behind the deterioration of the quality of the loan portfolio of different banks which destroy the soundness of the banking system and put the banks into financial crises. The banking history demonstrates that the huge amount of bad loans or non-performing loans in banking system generally results in bank failure. So, determination of factors that causes the non-performing is vital one for every banks to ensure the soundness of the banking sector in Bangladesh. (Emran, 2020).

For ensuring smooth economic growth it is mandatory for every bank to minimize their non-performing loan. Minimizing non-performing loan is so much crucial, the reason behind this is that if the non-performing loans (NPL) retain permanently, then it will have an acute impact on resources, as the resources are locked in unprofitable areas. The shocks to the financial system can arise from micro-economic factors (unsystematic shocks) and macro-economic factors (systematic shocks). In this regard banks should consider the economic condition of the country and firm specific variables because when the economy is in depression then the creditworthiness of the borrowers will decrease automatically which ultimately increase the overall amount of non-performing loan in the economy.

2. LITERATURE REVIEW

Over the last few years non-performing loan related literature has increased with the interest provided to understanding the reasons behind financial vulnerability as increasing NPL ceases to generate income for a bank. During 1990s, it is demonstrated in many countries that impaired assets play an important role in financial vulnerability. Non-performing loan is a major issue for researchers. To identify the root cause of non-performing loan, researchers examined different types of variables. Among those variables, macro-economic variables, bank related variables and regulatory framework has been broadly examined. In different countries, regulations for classifying loan as NPL are different. In most cases, a loan is considered as non performing if it is unpaid for more than

Determinants of Non-Performing Loans in Bangladesh: An Empirical Study on the Banks Listed in Dhaka Stock Exchange

90 days over the specific given time period. NPL can be expounding by two different ways. Both macroeconomic variable and bank specific variable can be the focal point of NPL. The literature review supports both the indicators.

Bank Level indicators

Several authors pay tremendous focus on the literature review of non-performing loans especially in case of understanding the variables that are liable to the financial vulnerability (Khemraj, 2009). The financial vulnerability of different economic variables can be explained by showing the relationship between NPL and banking crises. Some examples of variables that can be used for determining the vulnerability of financial system are non-performing loans, loan losses provisions, return on assets, percentages changes in loan balance and so on (Sorge, 2004) There has a clear relation between cost efficiency and loan quality among European savings banks during the period of 1990 to 1998 (Williams, 2004). (Berger, 1997) identified association between NPLs, cost efficiency and capitalization in commercial banks of US from 1985 to 1994 and states that low cost efficiency denotes a weak management performance which leads to poor underwriting, monitoring and control.

As a result, NPLs are likely to surge. (Boudriga, 2009) identifies factors that affect NPL are high credit growth, loan loss provisions and foreign participations of developed countries. Return on assets (ROA) is used as the performance indicator of different banks (Godlewski, 2004). The author shows negative relationship between bank's profitability and NPL ratio. Besides, higher level of return on equity (ROE) results in higher level future risks (Garcia- Marco, 2008). They argue that the policy of profit maximization is accompanied by high levels of risk. There has a negative relationship between equity-to-asset ratio and NPLs. For reducing volatility of earnings as well as higher level of capital loss, banks create higher provisions. In addition to this in recent time banks create higher level of provision in order to strengthen their medium-term solvency. Besides for indicating the financial strength of the banks, loan loss provision is exclusively used by the managers (Ahmad, 2009).

Macroeconomic indicators

(Nkusu, 2011) classified literature review into three sections: The first section of literature review pays tremendous focus on explaining the NPL in different banks and credit institutions in the country and showing the effect of macroeconomic performance, political choices, and quality of

management (Dash, 2010). The second section of literature review shows the relationship between NPL and different macro-economic variables like GDP, inflation or real interest rate for showing the positive impact of NPL on the creation of banking crises (Caprio, 1996). Third section of literature review shows the relationship between NPL and macro-economic through using the methodology of regression analysis. Macro level relates to total loans in one economy or certain types of loans. The macroeconomic environment is one of the major determinants of measuring the ability of the borrowers to get a loan. At the time of economic growth, it is seen that the revenues will increase as well as chance of default will decrease. As a result, growth in real GDP and rate of employment are negatively associated with NPL. On the other hand, there is a positive relationship between unemployment rate and NPL. Different empirical results show a negative relationship between real GDP growth and NPL (Salas, 2002).

Several studies demonstrate that higher level of GDP growth increase the income level of borrowers which enable them to pay more against their outstanding debts which ultimately decrease the total amount of bad debts. On the other hand, when the economy is in downturn, the growth of real GDP will decrease subsequently which increase the total amount of bad debts. Debtor's complications in repaying their debt increases with an increase in level of unemployment (Fofack, 2005). In case of floating interest rate, the interest rate can significantly affect the total amount of bad debt. As result the increase of interest has a positive impact which increases the total amount of debt because of increase in payment of interest rates which ultimately increase the amount of NPL (Bofondi, 2011). The countries which deal in foreign currencies to unfreeze the debtor, the service of repaying debt are affected by floating interest rate (Louzis, 2010).

When Non-Performing Loan (NPL) explained by real GDP growth, credit conditions and real interest rate by using their model of Regression Analysis try to find out the determinants of NPL for Spanish banking sector (Khemraj, 2009). They found a positive impact of real effective exchange rate on impaired loans. The empirical results of their analysis show negative relationship between GDP growth and NPL indicates that increase GDP growth results in decrease of Non-Performing Loan (NPL). The research conducted by Nkusu shows that adverse macroeconomic developments associated with increase in Non-Performing Loan (NPL). The results are demonstrated by panel vector autoregressive (PVAR) for showing the feedback between macro-economic determinants and NPL. According to this author, the NPL have a central role in the relationship between credit market frictions and macro-financial vulnerability (Nkusu, 2011).

3. DATA AND METHODOLOGY

In the previous chapter, evidence has been provided in the literature review section that both aggregate and disaggregate data are applied for corresponding investigations. The purpose of the study is to find out the indicators which affect non-performing loan in Bangladesh. Aggregate data is preferable as it reduce the risk of non-representativeness of the sample (Boudriga, 2009). We have examined both types of data to examine the determinants.

Estimation analysis

We have taken all listed banks from banking industry and collected 5 years' data from 2014 to 2019. Here, total number of observation is 150. Here, dynamic panel regression method has been conducted to find the relationship between non-performing loan of selected banks and different macro-economic (such as GDP, unemployment rate, real interest rate) as well as micro-economic variables (such as like loan loss reserves, return on assets, percentages changes in loan amount). We have implemented the fixed and random effect regression model so that consistent and unbiased result can be ensured. The whole analysis has been conducted on the basis of the data from 2014 to 2019 of respective variables. It includes the analysis of correlation, coefficient, R square, F-test, T-test and so on.

Model Specification

An econometric model has been constructed to show the relationship between NPLs and other macro-economic variables. The model is expressed as follows:

$$NPL = a_0 + a_1X_t + a_2M_t + \epsilon_t \dots \dots \dots \text{(Equation1)}$$

NPL= Aggregate non-performing loans to total gross loans

X= Bank specific variables

M= Macro-economic variables

i= Examined banks of the sample

t= Respective year

Sample and Data collection

In this Paper, all banks from banking industry of Dhaka Stock Exchange Limited are selected for pursuing the purpose of the analysis. In collecting data, secondary data collection method is used. Most of the data used for the analysis has been collected from different organization like World

Bank, Bangladesh Bureau of Statistics (BBS), Bangladesh Bank, Data Resource Bd. In this paper both macroeconomic as well as microeconomic data are used. Under macroeconomic data: gross domestic products (GDP), unemployment rate, exchange rate, inflation rate are used. On the other hand, return on assets (ROA), return on equity, loan to asset ratio, percentages changes in loans are used as the bank specific data or microeconomic data.

Variable Matrix

The matrix gives us the idea about the variables we used in the model as well as how those variables were calculated, presented in the definition section and in the hypothesis test. We got the idea about all of these hypothesis variables which will determine the relationship between independent and dependent variables.

Table 1: Different variables with definition and expected sign.

Variable	Definition	Expected Sign
GDP Growth	$GDP_1 - GDP_0 / GDP_0$	(-) relationship with NPL
Unemployment rate	Unemployed/ Labor Force	(+) relationship with NPL
Inflation	CPI (%)	(+)/(-) relationship with NPL
ROA	Profits/Total Assets	(-) relationship with NPL
Loan Amount	$Loan_1 - Loan_0 / Loan_0$	(+) relationship with NPL
Loan to asset ratio	Total loan/Total asset	(-) relationship with NPL

We investigated the impact of different macroeconomic indicators on the dependent variable NPL. Macroeconomic variables have a great impact on the stability of banking system (Espinoza, 2010). In this circumstance, we have added variables GDP, inflation rate, unemployment rate so that economic condition of Bangladesh for the period 2015-2019 can be captured and how NPL is affected by them. Gross domestic product (GDP) growth rate is negatively related to non-performing loans. GDP is the aggregate amount of income included in the economy during a specific period due to increase in prices (Daferighe, 2009). Unemployment rate is the rate which indicates the percentage of the workforce that is out of the work or job. It is a lagging indicator, meaning that it generally rises or falls in the wake of changing economic conditions, rather than anticipating them. NPL is expected to have a positive relation with unemployment (Nkusu, 2011). Inflation is measured as a rate at which prices of goods and services in an economy rises over a certain period of time. Impact of

Determinants of Non-Performing Loans in Bangladesh: An Empirical Study on the Banks Listed in Dhaka Stock Exchange

average inflation rate by which borrower’s ability to pay loans is affected on loan quality can be equivocal, thus can state both positive and negative relationship with NPL (Nkusu, 2011). ROA measures how efficiently a company is managing its assets to generate profit. The ratio of net income to total assets is used as the proxy to determine the ROA. This is known as profitability ratio. Profitability ratios indicate how banks can use their assets and shareholders’ equity in order to generate profits. A negative sign is expected in the correlation of ROA with NPL (Louzis, 2010). The loans to assets ratio quantify the total loans outstanding as a percentage of total assets. Higher loan to asset ratio indicates a bank is loaned up with a very low liquidity position. It measures how efficiently a company is managing its assets. The higher the ratio, the riskier a bank which may create higher defaults. A positive relationship between loan quality and NPL is anticipated (Sarat, 2010). Percentage changes in loan refer to changes in total amount of loan in relation to previous year. Level of risk is measured by percentage change in loan. And this variable is directly proportional to non-performing loans (Sorge, 2004).

4. EMPIRICAL RESULTS

Summary Statistics

In the descriptive analysis, it is seen that during the period of (2015-2019) the mean value of non-performing loan is 14.03%. It means that the average level of non-performing loan for banks of Bangladesh is about 14.03% during the period of 2015 to 2019. On the other mean value for independent variables that means ROA, Loan growth rate, Loan to asset ratio, GDP growth rate, rate of unemployment and average annual inflation is 0.91%, 6.77%, 28.88%, 6.98%, 4.37%, 6.02% respectively. Here, it is seen that loan to asset ratio has the highest mean value. And return on asset has the lowest mean value. The standard deviation shows the variability of non-performing loan from the mean value. The value of standard deviation is 7.15% that means there is a chance of variation in non-performing loan from the mean value by this percentage. In case of independent variable, here it is seen that loan to asset ratio has the highest standard deviation which is about 28.88% and unemployment rate has the lowest standard deviation which is about 0.04%.

Table 2: Result of descriptive statistics.

Variable	Observation	Mean	Std. Dev.	Min	Max
Non-performing loan	150	.1403453	.0714622	.0125487	.3329522
Return on asset	150	.0091246	.0044967	.00063	.03419

Percentage change in loan	150	.0676992	.1170631	-.3021565	.5791655
Loan to asset ratio	150	.2888096	.100901	.0959028	.5753233
GDP growth rate	150	.06982	.006337	.0606	.079
Rate of unemployment	150	.04372	.0004033	.0431	.0442
Average annual inflation rate	150	.0602	.0053995	.056	.07

Analysis of Correlation

Here it is seen GDP and loan growth rate are positively correlated with Non-Performing Loan that means increase of those variables will conduct to increase of Non-Performing Loan. On the other hand, regression analysis shows that negatively correlated variables with non-performing loan are return on assets, loan to asset ratio, and rate of unemployment and average annual inflation rate. That means amount of non-performing loan decreases in response to the increase of these variables

Table 3: Correlation statistics of NPL with explanatory variables of Bangladesh.

	Non-performing loan	Return on asset	Percentage change in loan	Loan to asset ratio	GDP growth rate	Rate of unemployment	Average annual inflation rate
Non-performing Loan	1.0000						
Return on Asset	-0.0556	1.0000					
Percentage change in loan	0.1156	-0.0114	1.0000				
Loan to asset Ratio	-0.5724	0.0748	-0.0233	1.0000			
GDP growth Rate	0.2770	-0.1871	-0.0613	-.3103	1.0000		
Rate of unemployment	-0.2489	0.1679	0.0464	0.2748	-.9131	1.0000	
Average annual inflation rate	-0.2318	0.1259	0.0846	0.2892	-.9051	0.7378	1.0000

Cross-sectional dependence Test

If there has cross sectional dependency on variables this means that active performance of one bank have impact on the performance of other banks in the long run. The hypotheses of the test are as follows:

H0: No cross-sectional dependence H1: Cross sectional dependence

Determinants of Non-Performing Loans in Bangladesh: An Empirical Study on the Banks Listed in Dhaka Stock Exchange

Table 4: Result of cross sectional dependence.

Test	Statistic	d.f.	Prob.
Breusch-Pagan LM	748.7923	435	0.0000
Pesaran scaled LM	9.621460		0.0000
Pesaran CD	1.053769		0.0420

As the test result probability is less than 5%, this means null hypothesis is rejected at 5% confidence level and there exists cross sectional dependency between all banks.

Unit Root Test

This test identifies whether the data set is stationary or not. The study identifies the panel unit root by using Fisher Hadri test.

H₀: All panels are stationary

H₁: Some panels contain unit root

Results have been added to the appendix

Multicollinearity Test

Multicollinearity problem causes difficulty in determining the separate effects of individual variables. (Hair, 2006) suggests that a very small tolerance value (0.10 or below) is an indication of low collinearity and a large variance inflation factor (VIF) shows high collinearity.

H₀: No multicollinearity if Mean VIF < 10

H₁: Multicollinearity if Mean VIF > 10

Table 5: Multicollinearity test.

Multicollinearity test	Mean VIF value
	6.70

The mean value of VIF test (Table 12) 6.70 states that independent variables do not contain multicollinearity problem. Those variable variances are centered on the regression line.

Heteroskedasticity test

The Heteroskedasticity test, known as the het test in short, helps to determine whether the data set is homogeneous or heterogeneous.

Normally a homogenous data set is expected which means that the data in the data set are identical. The hypothesis of this test is –

H0: Panel data set is homogeneous

H1: Panel data set is heterogeneous

Table 6: Heteroskedasticity test.

chi2(1)	0.18
Prob > chi2	0.6679

From the above statistics, it can be seen that that the p value (probability) is greater than 5% (0.6679). It suggests that we should accept the null hypothesis which implies that the data set is homogeneous. So it can be concluded that the data set is homoskedastic and normal.

Result of fixed effect regression model in banking industry

The results and explanations of this fixed effect regression test are as follows-

Table 7: Correlation of Determination (R^2).

R-squared:	Within = 0.4039	Observation per group:	Min = 5
	Between = 0.2363		Avg = 5
	Overall = 0.2490		Max = 5

In this model, it is seen the value of R^2 is .4039 which means that about 40.39% of total variability in the Non-Performing Loan is explained by independent variables. One independent variable GDP growth rate has a VIF of 21.16 which is more than 10 and it implies that this variable has multicollinearity problem. From the correlation analysis, it has been found that GDP growth rate is highly correlated with rate of unemployment. From these two variables GDP growth rate is more relevant when determining factors affecting non- performing loan. So, we have omitted rate of unemployment variable and again run the regression model followed by multicollinearity test.

Table 8: Results of Fixed Effects Model for Panel Data.
(Multicollinearity corrected).

S/N	Independent Variable	Coefficient	t	P>t
1	Return on asset	-2.038058	-2.47	0.015
2	Percentage change in loan	-.0159624	-0.62	0.537

Determinants of Non-Performing Loans in Bangladesh: An Empirical Study on the Banks Listed in Dhaka Stock Exchange

3	Loan to asset ratio	0.1679488	0.26	0.026
4	GDP growth rate	0.909676	2.86	0.031
5	Average annual inflation rate	0.173248	1.05	0.205
	_cons	-.753251	- 0.85	0.424
R ² =40.01% N=150				
Prob>F=.0000				

In fixed effect regression model, coefficients analysis predicts that for one percent increase of annual growth rate of GDP, Non-Performing Loan will increase by 0.9097, for one percent increase in average annual inflation rate, Non-Performing Loan will increase by 17.32%. In case of loan to asset ratio, Non-performing loan will increase by 0.1679 holding all other independent variables remain constant. While for one percent increase of return on assets and percentage changes in loan, Non-Performing Loan will decrease by 2.04 and 0.0159 percent respectively.

Table 9: Results of F-test for Fixed Effects Model.

Particulars	Result
F (6,114)	12.87
Prob > F	.0000

The “Prob > F” value in this model is less than 0.05 (“Prob > F” = 0.0000) which indicates that the null hypothesis (i.e., all of the regression coefficients are zero) is less than 5% true and thus rejects the null hypothesis with about 95% confidence level. This also indicates that the model is statistically significant and properly fitted and coefficient is not equal to zero.

Table 10: Results of T-test for Fixed Effects Model.

Independent Variable	T	P>t	[95% Conf.	Interval]
Return on asset	-2.38	0.019	-3.623238	-.3318613
Percentage change in Loan	-0.64	0.526	-.0675357	.0347127
Loan to asset ratio	-2.23	0.028	-.3139677	-.0182711
GDP growth rate	2.17	0.032	.3518409	7.843587
Rate of unemployment	0.75	0.457	-22.28674	49.18375
Average annual inflation rate	1.28	0.202	-.914864	4.272322

In the above analysis, it is seen that GDP, loan to asset ratio and return on assets, DDP growth rate show lower level of significance (less than 5%) that means it rejects null hypothesis meaning that there is a linear relationship between non-performing loan and these variables. On the other hand, other independent variables (unemployment rate, inflation, loan growth rate) shows higher level significance that means they accept null hypothesis that means there is a non-linear relationship of non-performing loans with unemployment rate, inflation and loan growth rate.).

Result of random effect regression model in banking industry

In case of random effects model, it is seen the value of R² is .3960 which means that about 39.60% of total variability in the Non-Performing Loan is explained by Annual Growth Rate of GDP, Unemployment Rate, and Average annual inflation rate, Return on Assets, Loan to Asset Ratio and Percentage Changes in Loan.

Table 11: Correlation of Determination (R²).

R-squared:	Within = 0.3960	Observation per group:	Min = 5
	Between = 0.3045		Avg = 5
	Overall = 0.3125		Max = 5

It is known to all that higher level of non-performing loan is quite unexpected for the economy and it creates several problems to the economy. If the invested funds in an economy are not recovered, it limits the recycling of the funds is reduced by the amount of classified loans which may lead to economic stagnation. Because of creating provision for non-performing loan and consequent write off as bad debts, banks' profitability adversely affected by non-performing loan. GDP growth is one of the most popular performance measures for determining the overall economic performance of the country.

Table 12: Results of Random Effects Model for Panel Data.
(Multicollinearity Corrected).

S/N	Independent Variable	Coefficient	Z	P>z
1	Return on asset	-1.668622	-2.05	0.040
2	Percentage change in loan	.0002206	0.01	0.993
3	Loan to asset ratio	.2557323	4.17	0.000
4	GDP growth rate	0.618863	2.58	0.010
5	Average annual inflation Rate	0.26903	1.12	0.264

Determinants of Non-Performing Loans in Bangladesh: An Empirical Study on the Banks Listed in Dhaka Stock Exchange

	_cons	-.0299451	-0.22	0.830
R ² =39.32% N=150				
Prob>chi2=.0000				

In case of this model, coefficients analysis predicts that for one percent increase of annual growth rate of GDP, Non-Performing Loan will increase by 61.89%, for one percent increase in average annual inflation rate, Non-Performing Loan will increase by 0.2690. In case of loan to asset ratio, Non-performing loan will increase by 0.2557 holding all other independent variables remain constant. While for one percent increase of return on assets and percentage changes in loan, Non-Performing Loan will decrease by 1.67 and increase by 0.0002 percent respectively.

Table 13: Results of Chi-test for Random Effects Model.

0	Result
Wald Chi2(6)	84.78
Prob > Chi2	.0000

In the random effect regression model the “Prob > Chi2” value is less than 0.05 (“Prob > F” = 0.0000) which indicates that the null hypothesis (i.e., all of the regression coefficients are zero) is less than 5% true and thus rejects the null hypothesis with about 95% confidence level. This also indicates that the model is statistically significant and nicely fitted and coefficient is not equal to zero. In the analysis, it is seen that GDP, loan to asset ratio, return on asset, GDP growth rate shows lower level of significance (less than 5%) that means it rejects null hypothesis meaning that there is a linear relationship between non-performing loan and these variables. Alternatively, we can say that GDP, loan to asset ratio and return on asset are the significant variables to explain the dependent variable (NPL). On the other hand, other independent variables (unemployment rate, inflation, loan growth rate) shows higher level significance that means they accept null hypothesis that means there is a non-linear relationship of non-performing loans with unemployment rate, inflation and loan growth rate. Alternatively, these variables are not significant to explain dependent variable (NPL).

Table 14: Results of Z-test for Random Effects Model.

S/N	Independent Variable	Z	P>z	[95% Conf.	Interval]
1	Return on asset	-1.97	0.049	-3.191889	-.0053542
2	Percentage change in loan	-0.00	0.997	-.0498842	.0497

3	Loan to asset ratio	-4.15	0.000	-.375137	-.134387
4	GDP growth rate	1.99	0.047	.0492299	7.529959
5	Rate of Unemployment	0.73	0.468	-22.6424	49.24892
6	Average annual inflation rate	1.33	0.184	-.8381968	4.37588

Hausman Test

In case of Hausman test, there are two hypotheses.

Null Hypothesis: Panel model-random effects; there is no correlation between dependent variable (NPL) and independent variables.

Alternative Hypothesis: Panel model-fixed effects; there is a correlation between dependent variable (NPL) and independent variables.

For determining the appropriate model, we focus on Chi². If the probability value of Chi² is more than 5% then I should accept null hypothesis while probability value less than 5% means that null hypothesis should be rejected and alternative hypothesis should be accepted.

Table 15: Hausman test.

Chi ² (6)	=	(b-B)' [(V _b -V _B) ⁻¹] (b-B)
	=	4.92
Prob > Chi ²	=	0.4263
(V_b-V_B is not positive Definite)		

Here the probability value is very low 0.4263 which is 42.63 percent meaning that it is greater than five percent, in that case I can accept the null hypothesis. So, the appropriate model is the random effects model to explain the outcome of the results. So, it can be concluded that the random effect regression model fits best for this research.

Compliance and contrast between empirical results and analysis results

In case of annual GDP growth rate, empirical results show negative relationship between NPL and GDP. The result of the regression analysis is not complied with the empirical results. Empirical results show that non-performing loan will decrease in response to the growth rate of GDP. Regression analysis shows that non-performing loan will increase in response to the increase of growth rate of GDP. There some specific reasons behind this: First of all, it is observed that, Bank grants a huge amount of loan on political consideration as well as without proper evaluation of the creditworthiness of the borrower. Besides the banks are not considered all types of risk in case of distribution of loan, they only

Determinants of Non-Performing Loans in Bangladesh: An Empirical Study on the Banks Listed in Dhaka Stock Exchange

concern about the profitability of the bank and because of this reason they issue loan to risky and worthy borrowers which ultimately increase the overall amount of non-performing loan.

5. FINDINGS AND CONCLUSION

The paper is designed to identify different macro-economic and micro-economic variables which can affect and influence non-performing loan (NPL) and doubtful accounts for banking industry of Dhaka Stock Exchange Limited in Bangladesh. The results of regression analysis show that GDP has a positive impact on non-performing loans. On the other hand, in case of return on assets analysis shows that return on assets has a negative impact on non-performing loan. In addition to this it is also seen that loan to asset ratio is positively correlated with non-performing loans that means provision increases in response to the increase of non-performing loans. According to the findings, return on asset, loan to asset ratio and GDP growth rate are the significant variables to explain the dependent variable (non-performing loan) as it has the probability less than 5%. The results of the analysis show that, every bank should give interest to many macro and micro economic variables for decreasing the level of non-performing loans at the time of distributing loan. In the case of distributing loans, bank should consider the economic condition of the country because when the economy is in depression then automatically the creditworthiness of the borrowers will decrease which ultimately increase the overall amount of non-performing loan in the economy. Besides in case of extending loan, banking sector should pay tremendous concentration on their profitability & assets base.

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Determinants of Non-Performing Loans in Bangladesh: An Empirical Study on the Banks Listed in Dhaka Stock Exchange

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Appendix:

Stationary test results

Hadri LM test for Non-performing loan		
	Statistic	p-value
Z	-1.1256	0.8698

Hadri LM test for Return on asset		
	Statistic	p-value
Z	-0.5851	0.7208

Hadri LM test for Loan growth rate		
	Statistic	p-value
Z	-1.7397	0.9590

Hadri LM test for Loan to asset ratio		
	Statistic	p-value
Z	-0.4163	0.6614

Hadri LM test for GDP growth rate		
	Statistic	p-value
Z	-8.7386	1.0000

Hadri LM test for Rate of unemployment		
	Statistic	p-value
Z	-8.7386	1.0000

Hadri LM test for Average annual inflation rate		
	Statistic	p-value
Z	-8.7386	1.0000