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Determinants of Non-Performing Loans of Banks in Bangladesh: An Exploratory Study

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Abstract

This paper aims to explore the bank-specific and macroeconomic determinants of non-performing loans (NPLs) in the banking sector of Bangladesh using Ordinary Least Square regression model draws from EVIEWS 10. The study undertakes 20 Commercial banks including 16 private commercial banks, 2 public commercial banks and 2 foreign banks and the period covers 11 years data ranging from 2009-2019 and uses 5 bank-specific and 2 macroeconomic variables to assess the impact of banking management and economic indicators on NPLs. The bank specific data are obtained from the Annual Report of the sample bank. The macro-economic data are collected from Economic Indicators Sections of Bangladesh Bank. The empirical result shows that at the macroeconomic level the economic growth as measured by gross domestic product significantly impacts the NPLs of banks. In case of bank specific factors operating inefficiency, bank size, liquidity, capital adequacy ratio, and profitability are found to control the NPLs levels significantly. The findings of the empirical study indicate that inefficient management and poor and ineffective financial policies are the primary cause of high NPLs in Bangladesh.

Keywords: Non-performing loan, Bank Specific factor, Macro-economic factor, panel data models

1. Introduction

In a bank based financial system, the quality of asset of banks is a matter of serious concern to the regulatory authorities both from the viewpoint of stability in the financial system as well as from the viewpoint of efficiency of bank management. A stable and sound financial system helps the economy in mobilizing the savings towards productive economic activities. It also promotes economic growth by acting as a bridge between deficit and surplus economic units. However, deterioration in quality of assets of banks and the subsequent increase in non-performing loans (NPLs) severely affects the process of financial- intermediation (Berger and Hefeker, 2008). NPLs pose a serious threat to the banking sector as well as the economy. After the global financial crisis in 2008, financial institutions suffered from many problems especially bad debts. Many established financial institutions collapsed due to increasing amount of NPLs Literature and practice have shown that non-performing loans are the leading cause of financial crises (Brown bridge, 1998).

Various factors affect NPLs of banks differently. It appears that bank specific factors play relatively more significant role in the evolution of NPLs over time as these factors directly affect the health of banks. In fact, loan decision making, management of loan default, loan recovery process, risk exposure and more importantly the performances of banks are different for different banks. All these factors affect NPLs of banks. When discussing bank level factors for non-performing loans, Berger and De young (1997) explores three hypothesis-viz, the first hypothesis covers bad management hypothesis which postulates that low measured cost efficiency is a signal for poor bank management as inefficient bank managers do not control and sufficiently monitor their operating expenses which are reflected in low measured cost efficiency. Second Skimping hypothesis, postulates that a bank may rationally choose to have lower costs in the short run by economizing on the resources allocated for monitoring and underwriting a loan, but ultimately bears the consequences of higher NPLs and the possible costs of dealing with these problem loans in the future. Third, the moral hazard hypothesis, postulates that thinly capitalized banks raise the riskiness of their loan portfolio through moral hazard incentives on the part of bank managers.

The research also finds out that macro-economic factors which supports the bad luck hypothesis are also influence NPLs significantly. Macro-Economic movement in the business such a s in an expansionary phase in the economy, firms' profits tend to increase, asset prices increase, loan recovery rate

increases and overall NPA decreases. However, during the boom, banks also underestimate their risk exposures, relax credit standards, and reduce provisions for future losses. Once the cyclical upturn is over and the business cycles turn down, borrowers credit worthiness deteriorates because of the fall in profits. This may lead to increase in NPLs and greater provisioning. In an economy where economic crises entails, GDP falls and Inflation rate high, research finds that NPLs are high in that economy.

In Bangladesh banking sector, NPL ratio has been reduced in December 2019 at 9.3 percent and at the end of June 2020 NPL ratio stood at 9.16 percent. Though it seems to a reduced level, but it is still high as compared to international standard of 2 percent. It is also found out from Bangladesh bank Annual report that at the end of June 2020, NPL ratio for SCBs, SBs, PCBS and FCBs stood at 22.7 percent, 15.9 percent, 5.9 percent, and 5.5 percent respectively which might pose future concern for the financial system stability. Against this background, this paper investigates various bank specific factor and macroeconomic factor for determining the non-performing loans of banks in a developing economy like Bangladesh.

2. Objectives of the Study

The main objective of the study is to explore the determinants of non-Performing loans of Banks in Bangladesh. To achieve the main objective the following specific objectives have been covered.

- i) To examine the current position of Non-Performing Loans in Bangladesh.
- ii) To explore the bank-specific determinant of Non- Performing Loans.
- iii) To investigate the macro-economic determinants of Non-Performing Loans.
- iv) To put policy framework for effective management of Non-Performing Loans.

3. Literature Review

Amuakwa-Mensah and Boakye-Adjei (2014), in their article found that bank specific variables last year's NPL, net interest margin (NIM), bank size and present year's loan growth and macro-economic variables (real gross domestic product (GDP) per capital growth, last year's inflation, and real effective exchange rate significantly affect NPL.

Anisa (2015) investigated the causes of non-performing loans in Ethiopia, for the period 2004 to 2013 using both bank-specific and macro-economic variables. The empirical study revealed that deposit rate, loan-to-deposit ratio and lending interest rate had a positive and significant impact on NPLs, while

bank solvency ratio, GDP growth rate and inflation rate had a negative and statistically insignificant impact.

Bonilla (2011) investigated the determinants of non-performing loan indices in Spain and Italy within the period January 2004 to March 2012 using credit growth, wages, inflation unemployment and GDP as macro-economic variables. The study revealed that among the macroeconomic variables, unemployment, wages, and GDP significantly affected non-performing loan indices in both countries. Messai and Jouini (2013) carried out a study using a sample of 85 banks in Italy, Greece, and Spain to identify determinants of NPLs between 2004 and 2008. The empirical research findings showed that GDP growth rate is negatively related to NPL, while unemployment and interest rate are positively related to non-performing loan.

Castro (2013) concluded that the macro-economic environment significantly affects the bank's credit risk. The author finds a substantial increase in non-performing loans during the recent financial crisis period and documents the impact of GDP growth, share price indices, unemployment rate, interest rate, credit growth and the real exchange rate. Ghosh (2015) examined the state level banking industry specific as well as regional economic factors to evaluate the effect of non-performing loans on commercial banks and savings institution across 50 USA states and the District of Columbia for 1984-2013. Using fixed effects and the Dynamic GMM-estimations, the study found that the high capitalization, liquidity risk, poor credit quality, high-cost inefficiency and the size of banking industry significantly increases NPLs whereas the high bank profitability lowers NPLs. Moreover, the inflation rate, the unemployment rates and the US public debt significantly increase NPLs. Ekaneycke and Azeez (2015) studied nine licensed commercial banks for the period 1999-2012 to determine the factors affecting non-performing loans in Srilanka's banking system. The level of NPL's had a positive correlation with the size of banks, the efficiency, the loans to assets ratio and the prime lending rate during the study period. However, the credit growth, the GDP growth rate and the inflation rate were associated with a low level of non-performing loans. Klein (2013) applied a panel VAR to investigate the effect of bank-specific and macro-economic factors on NPLs taking the sample of 16 Central Eastern and Southeastern European nations (CESEE) for the period 1998-2011. The empirical results showed that the unemployment rate and the exchange rate depreciated NPLs ratio, whereas the inflation rate, the euro area GDP growth and the Global risk aversion had a direct impact on the asset quality of banks. Similarly, the profitability reduced NPLs, while the loan to assets ratio and the credit growth rate increased NPLs during the pre-crisis and post crisis periods.

4. Methodology of the Study

The study covers the commercial banks operating in Bangladesh under different ownership groups. For this purpose, our sample consists of an unbalanced panel of 16 private commercial banks, 2 public sector banks and 2 foreign banks. These banks despite belonging to different ownership groups are fairly homogeneous in their functioning and are subject to same regulatory bindings. The period of analysis consists of 11 years from 2009 to 2019. Finally, we have an unbalanced panel of 20 banks with 220 observations.

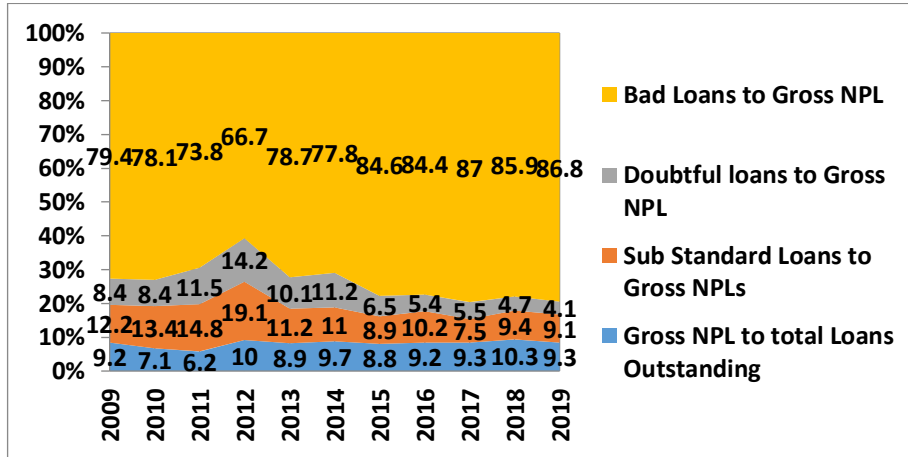
The empirical study is based on both primary and secondary sources of data. Primary data were collected through questionnaires prepared by the researchers which were given out to the 30 Bank managers selected randomly. The questionnaire was developed from an extensive review of literature and was designed based on research objectives. Completed questionnaires were collected directly from the respondents. Secondary data were collected from relevant Govt. publications, published books, articles in journal, newspapers, scheduled bank statistics, Annual Report of Bangladesh Bank, Annual Report of sample banks and the like.

5. Current Position of Non-performing Loans of Banking sector in Bangladesh

Table-1: Year wise Gross NPL Ratio and its Composition
(In Percentage)

Year	Gross NPL to total Loans Outstanding	Sub Standard Loans to Gross NPLs	Doubtful loans to Gross NPL	Bad Loans to Gross NPL
2009	9.2	12.2	8.4	79.4
2010	7.1	13.4	8.4	78.1
2011	6.2	14.8	11.5	73.8
2012	10.0	19.1	14.2	66.7
2013	8.9	11.2	10.1	78.7
2014	9.7	11.0	11.2	77.8
2015	8.8	8.9	6.5	84.6
2016	9.2	10.2	5.4	84.4
2017	9.3	7.5	5.5	87.0
2018	10.3	9.4	4.7	85.9
2019	9.3	9.1	4.1	86.8

Source: Banking Regulation and Policy Department, Bangladesh Bank.



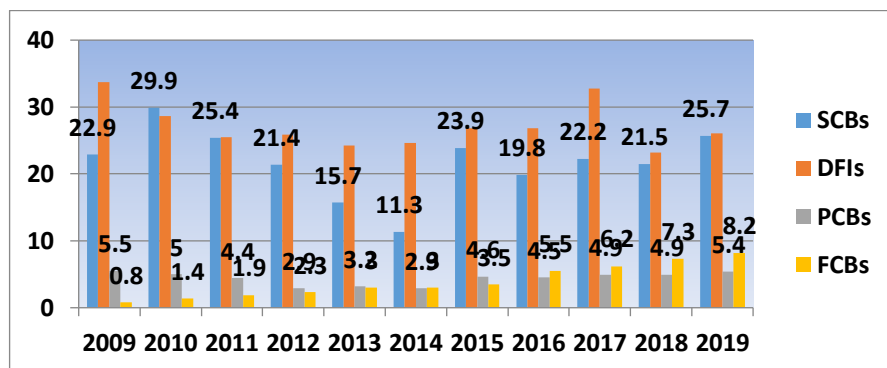
It is revealed from table-1 that non-performing loans of Banks in Bangladesh banking sector holds 9.2 %, 7.1%, 6.2%, 10.0%, 8.9%, 9.7%, 8.8%, 9.2% 9.3% ,10.3% and 9.3% respectively during period from 2009 to 2019. After Financial Sector Reform in 1999, the level of NPLs has been decreasing tremendously. But from 2009 to 2019 the average level of NPLs was almost stable at 8% which is much higher in comparison to International Standard of 2%. Moreover, the composition of NPLs reveals that bad loan percentage consumes higher percentage of more than 80 % for which high level of loan loss provision must be maintained which adversely affect the profitability and capital adequacy of banks.

Table-2 Ratio of Gross NPL to total Loans by types of Banks (in %)

Bank types	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
SCBs	22.9	29.9	25.4	21.4	15.7	11.3	23.9	19.8	22.2	21.5	25.7
DFIs	33.7	28.6	25.5	25.9	24.2	24.6	26.8	26.8	32.8	23.2	26.1
PCBs	5.5	5.0	4.4	2.9	3.2	2.9	4.6	4.5	4.9	4.9	5.4
FCBs	0.8	1.4	1.9	2.3	3.0	3.0	3.5	5.5	6.2	7.3	8.2
Total	9.2	7.1	6.2	10.0	8.9	9.7	8.8	9.2	9.3	10.3	9.3

Source: Bangladesh Bank Annual Report, Various Issues

From the table 2, it is seen that at the end of December 2019 PCBs had the lowest and DFIs had the highest ratio of gross NPLs to total loans.



PCBs gross NPLS to total loan ratio was 5.4 percent whereas that of SCBs, FCBs and DFIS were 25.7, 8.2 and 26.1 percent respectively at the end of December 2019. It is revealed that the ratio of NPLs to total loans of all the banks had shown an overall declining trend from 2009 to (13.2 percent) to 2014 (6.1 percent). But the ratio has increased in 2015 (10.0 percent) and again decreased in 2016 by 8.9 percent and again increased to 9.3 percent during period 2019. It is observed that SCBs and DFIs continued to have very high NPLs due to substantial loans provided by them on considerations other than commercial and under directed credit programs during 1970s and 1980s.

6. Regression Model

We use a panel estimator to evaluate the impact of various determinants on non-performing loan in Bangladeshi schedule banks

$$NPL_{it} = \alpha_i + \beta_1 BS_{it} + \beta_2 CAR_{it} + \beta_3 LR_{it} + \beta_4 ROA_{it} + \beta_5 OEOI_{it} + \beta_7 GDP + \beta_8 IF + \epsilon_{it}$$

Where indices *i* and *t* stand for bank and time, respectively. NPL *it* is the non-performing loan for banking in period *t*, α_i is the fixed effects intercept, and ϵ_{it} is the error term. In the study we have used 2 categories of explanatory variables 1) Bank specific and 2) Macro-economic specific variable that are summarized in Table-3. In total we have used 7 explanatory variables of which 5 are bank specific and 2 macroeconomic specific variables.

Table-3: Variables description and expected impact on non-performing loans of bank

Variable	Notation	Expected impact	Computation
Dependent variable			
Non-performing loans	GNPLR	Gross Non-performing loan ratio	
Independent variable			
Bank Specific variable			
Operating Inefficiency	OEOI	Positive	Operating expenses/operating income
Capitalization	CAR	Negative	Capital
			Risk weighted asset
Liquidity	LR	Negative	Total Loans
			Total Deposit
Size	LA	Positive	Logarithm of total assets
Profitability	ROA	Negative	$\frac{\text{Net Profit}}{\text{Total Assets}}$
Macroeconomic Variable			
GDP (Growth rate)	GDP	Negative	Gross Domestic Product
Inflation	INF	Positive	Point to point change in consumers price index

6.1. Variable Explained and Hypothesis development:

Dependent Variable:

Non-Performing Loan Ratio

Gross NPLs is a better indicator than Net NPLs for measuring defaulted loans of the banks. Non-performing loans ratio is the sum of substandard loan, doubtful loans and bad loans to total loans.

Independent variable:

Bank specific variables

Bank size (BS):

Size of bank reflects the strength and their ability to cope with the problem of information asymmetry. Salas and Scurina (2002) and Fernandez de Lis et al. (2000) reported a negative relationship between NPL and Bank size which is measured by taking the natural logarithm of total asset. According to their studies, large sized banks monitor loans regularly, have better risk management policies and high diversification opportunities. Hence, a negative co-efficient of bank size is expected.

H1: Bank size has negative influence on Non-performing Loans of banks. Operating Inefficiency (OEOI)

Inefficiency is measured as the ratio between operating expenses and operating incomes. High value of this ratio indicates poor management efficiency. Poor management and inefficient managers imply weak monitoring in operating activities and borrowers (Berger and Deyoung, 1997), which increases the probability of default.

H2: Inefficiency has positive influence on Non-performing Loans of Bank Profitability: (Return on Assets)

Return on assets (ROA) is a popular indicator to measure the profitability of banks. High ROA indicates a sound financial performance and a stable financial system. The profitable banks are less constrained to invest in risky loans because of less pressure to generate more revenue. Godlewski, (2005), Louzis et. al. (2012) and Boudriga et. al. (2010) in their article found negative relationship between ROA and NPL. The lower the return on asset the higher will be the NPLs and vice versa. (Halstamu, 2012).

H3: Profitability has a negative influence on NPL.

Capital adequacy ratio

The capital adequacy ratio measures the solvency level of banks. It is measured by total capital to risk weighted assets. Those banks which are having low-capital ratio face the problem of the high probability of failures. Capital ratio is the fact about the decision making of banks management, predicts the face of moral hazard hypothesis. (Abid, et. al. 2014).

Makri et. al. (2014), elaborate that capital adequacy ratio shows the strength and stability of any organization in times of crises. He argued that a negative

relation exists between NPL and capital adequacy, when riskier advances are targeted by the banks, then capital adequacy and NPLs tend to have a negative association. On the other hand, Djogap and Ngomsi (2012) report a positive relationship between capital adequacy and non-performing loans.

H4: *Capital adequacy ratio has negative impact on non-performing Loans.*

Credit to Deposit ratio (CDR)

The liquidity is measured by loan to deposit ratio. Higher credit to deposit ratio indicates that deposits are mobilized for generating revenues and increasing profitability. The profitability encourages investing deposits in the less risky sector with high credit standards. This activity prevents bad loans. Similarly lower loan to deposit ratio indicates inefficiency in resource allocation and low profit. Jameel (2014) and Anjom and Karim (2010) found that credit to deposit ratio has a negative relationship with the NPL. Makuri, et.al. (2014) argued that loan to deposit ratio of amount that is given or advanced as loan out of deposit. The higher the ratio of loan to deposit ratio, the higher will be the risk of the bank in rising level of NPL and vice versa (Ranjan and Chandra, 2003).

H5: *Credit Deposit ratio has a negative influence on NPLs.*

Macro-economic Variables

Gross domestic Product (GDP)

The main macro-economic element, which measures the development of an economy, is the gross domestic product (GDP). Louzis et. al. (2012) argued that GDP growth has a significant negative effect on NPLs. This is because growth in GDP creates employment opportunities, which increases the income level of borrowers and consequently reduces NPLs. Hence when, there is slowdown in the economy, the level of NPLs increases.

H6: *GDP growth rate has a negative influence on NPLs.*

Inflation Rate (IFL):

The rise in price of goods and services in an economy, over a period of time, is known as inflation. According to the price stability, indicator, a low level of inflation is favorable, for the economic growth, whereas a high inflation rate weakens the borrower's ability to service debt by reducing their real income and hence increases NPLs (Rinaldi, & Sanchis-Arellano, 2006), Some studies, have, however, found a negative relationship with credit risk. (Vogiazas & Nikolaidou,s 2011), Zribi and Bujelbene, 2011).

H7: *Inflation has a positive influence on NPLs Empirical Results*

Descriptive Statistics

The descriptive statistics of the variables used in this empirical analysis are presented in Table-4. NPL ranges from 5% to 9%. Variables CAR presents a minimum of 10 % and a maximum of 13%. In addition, the variables LQ and IE record a medium disparity as their values ranges from .83 to .97 and 3 to 5.80 respectively. However, LQ as implies the liquidity positions records a large standard deviation. As far as Profitability ratios are concerned, it has to be mentioned that ROA records a low disparity with minimum of 1 percent and maximum of 3 percent and the standard deviation is the minimum of .089443. Variable GDP shows a low disparity and positive sign with minimum of 5.24 percent and maximum of 8.15 percent, indicating that over the period 2000-2019, the country marked as positive growth. Furthermore, INFL demonstrates a minimum of 5.90 percent and maximum of 7.40 percent.

Table-4 Descriptive Statistics:

	Minimum	Maximum	Mean	Std. Deviation
NPL	5.00	9.00	7.0000	1.58114
CAR	10.00	13.00	11.6000	1.14018
LQ	.83	.97	.876000	5.72713
OIE	3.00	5.80	4.5400	1.06207
ROA	1.00	3.00	1.6000	.89443
GDP	5.24	8.15	7.1280	1.13669
IFL	5.90	7.40	5.6420	.20645

Table-5 Multicollinearity Diagnostic (Variable Inflation Factor):

	VIF	1/VIF
BS	1.563	.639
CAR	1.234	.810
LQ	1.342	.604
OIEF	1.023	.977
ROA	1.908	.524
GDP	1.133	.882
INF	1.2351	.809

To assess if the sample suffers from multicollinearity, Variance Inflation Factor (VIF) is computed for each variable. Table-5 shows that all VIF value do not exceed 5 which indicates the absence of multicollinearity. (Kothari and Garg, 2016)

Table-6 Econometric Results:

	Co-efficient	Std. Error	t statistic	Prob
C	43.22789	0.12196	22.95928	0.0277
BS	4.2566	3.2558	1.50736	.2823
CAR	-1.81724	.0308212	-14.89985	.0427*
LQ	-0.6222069	0.119998	-20.12461	.0316*
OIEF	.87612	.12223	7.16779	.0034*
ROA	-1.6793	0.11998	-1.39967	.0045*
GDP	-1.412140	0.266981	-5.28928	.0001**
INF	3.8125	1.52796	2.495170	.2427
R-Square	.789			
Adjusted R-Square	.776			
S.E of regressor	0.155384			
Loglikelihood	6.23882			
F-Statistics	137.765			
Prob (F Statistics)	.0001			

Note: Regression Results draws from EViews version 10. * Significant at 5% level, ** Significant at 1% level.

6.2. Estimation Results and Discussion

The Estimation results of our models are presented in the Table-6 where the coefficients of the explanatory variables and the corresponding t-statistics and p-values are shown. It is revealed from table that most of the estimated coefficient have signs as expected in the hypothesis and theoretical arguments in the literature.

The study found that the estimated result of multiple regression result is quite satisfactory. It is observed that the R² value and Adjusted R² value are 0.789 and 0.776 respectively. The value of adjusted R² value revealed that there is a good relationship between dependent and independent variable where all independent variables can explain about above 70% of the dependent variable/. On the other hand, ANOVA table also reflects goodness of Model and 'F' estimates that the regression is quite meaningful in the sense that dependent variable is related to each specific explanatory variable. It is seen that the Model is highly significant as the p value for F is less than .05% level.

The results show the positive effect of bank size on NPL which means that large banks take excessive risk. This finding is consistent with the results of Cotugno et al. (2010), Louzis et al. (2012), and Amuakwa–Mensah and Boakye–Adjei (2015), but in contrast with the result of Espinoza and Prasad (2010). Our empirical results support the “too big to fail” effect on risk taking. The results show there is positive and significant association between the credit risk and the bank size in the model which conforms with the result of Asamoah (2015).

It is observed that non-performing loans have a negative relationship with capital adequacy ratio and the relationship is significant as P value is less than 5 %. The findings support the Moral Hazard hypothesis of Berger and DeYoung (1997) which is also supported by the findings of Klein (2013) and Makri et al. (2014). This means that thinly capitalized banks generally grant loans to riskier borrowers which could potentially influence a rise in non-performing loan (Keeton, 1999, Salas and Saurina, 2002). Higher capital Adequacy ratio represents higher long term financing capacity, solvency, and default loans.

Loan to Deposit ratio shows the liquidity performance of banks and reflects the risk attitude of banks. The results show that a negative significant effect on NPLs in the model as P value is less than 5 %, which is consistent with the findings of Anjon and Karim (2016) and Dimitrois et.al (2016). The lower the loan to deposit ratio the lower the profit. In order to increase profitability, banks therefore grant loans haphazardly without maintaining credit standard which may lower the loan quality and hence increase the NPLs ratio. The result is consistent with the ‘moral hazard hypotheses.

It is also revealed that co-efficient of operating inefficiency (.87612) is positive and significant in the model as P value is less than .05. An increase in operating expenses increases the inefficiency and inefficiency in turn upholds the non-performing loans. Our empirical evidence supports the ‘bad management ‘hypothesis of Berger and De Young (1997) which is consistent with Podpiera and Weill (2008), Espinoza and Prasad (2010) and Louzis et.al (2012). The findings proves that better management is essential to improve loan quality as bad management in banking system could lead to a banking crisis. It is further observed that ROA has significant negative relationship with NPL as the co-efficient is -1.6793 and the P value is less than 5%. The results also support the bad management hypothesis and inefficient management of operating expenses decreases the profit and it indicates the sample banks are not capable of managing credit risk effectively.

Regression result regarding macro-economic determinant of NPLs, revealed that GDP growth rate is negatively and significantly related with NPL ratio

as P value is lower than .05 and co-efficient is -1.412140. The findings indicate that an increase in GDP creates job opportunities which in turn raises the payment capacity of the borrowers and hence reduces NPLs. The result is consistent with the expected research hypothesis. The model suggests that the GDP growth causes a reduction in NPL level. Our findings match with the results of Salas and Saurina (2002), Messai and Jouine (2013), Fofcke (2005), Louzis et. al (2012), Skarica (2014) and Dimitrois et. al (2016)

It is also found out that inflation is positively but insignificantly related with NPL ratio which is consistent with the result of Nkusu (2011), and Rinaldi and Sanches –Arellano (2006)

7. Conclusion and policy implications:

A low level of NPL indicates a sound financial system where as high NPL can indicate a vulnerable financial system. A high level of NPL initially affects the individual commercial banks and in the long run it ultimately runs the financial system and the economy of the entire nation distress (Feijo, 2011). For empirical estimation, panel data methods were used to study the various parameters which could impact the NPL levels of Banks. The econometric analysis of the macroeconomic and micro economic factors (bank-specific factors) shows that bank specific factors play a major role in the determination of NPLs level of Bangladesh banking sector.

The non-performing loans are not only affected by the monetary policy and the economic growth of a nation but also by the management of a banking industry, which is evident from the “bad management”, “moral hazard”, and “too big to fail” hypotheses supported by this study. The findings show that bank-specific variables play relatively more significant role in the evolution of NPLs overtime as these factors directly affect the health of a bank. In fact, loan decision making process, management of loan default, loan recovery processes, risk exposure, and more importantly, performance of banks play a significant role in managing Nonperforming loans.

It is further revealed that GDP growth rate is negatively and significantly related with NPL ratio as P value is lower than .05 and co-efficient is -1.412140. The findings indicate that an increase in GDP creates job opportunities which in turn raises the payment capacity of the borrowers and hence reduces NPLs. It is also found out that inflation is positively but insignificantly related with NPL ratio.

The findings of this paper indicate that the management efficiency and effective financial policy are required to stabilize the financial system and economy. For the purpose of financial stability, the regulatory authorities should focus more on risk management systems, managerial performance,

and measures to identify banks with possible default loans. The results of this paper have implications for decision makers at both macroeconomic and bank levels. The study recommends that loans granted to borrowers should be adequately reviewed regularly to assess the credit risk level and each loan should be secured with high valued collateral. This study can be extended further by including development banks in the study sample and the bank-specific variables over a longer period. It would be equally useful to examine other underdeveloped and least developed countries to generalize the empirical results found in this study. Similarly, in the future research, the model could be used to highlight regulatory, institutional, and legal factors as the key determinants of non-performing loans

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