The Impacts of Non-Performing Loan on Profitability: An Empirical Study on Banking Sector of Dhaka Stock Exchange

Rozina Akter[1] & Jewel Kumar Roy[2]

[1] Department of Business Administration, Faculty of Business and Economics, Daffodil International University, Bangladesh

[2] Department of Finance & Banking, Faculty of Business Administration, Jatiya Kabi Kazi Nazrul Islam University, Bangladesh

Correspondence: Rozina Akter, Senior Lecturer, Department of Business Administration, Faculty of Business and Economics, Daffodil International University, Bangladesh. E-mail: rozina@daffodilvarsity.edu.bd; roy.jkkniu@gmail.com or jewel_roy91@yahoo.com

Abstract

The Banking sector of Bangladesh is trapped in a gridlock of non-performing loans (NPLs) so much so that NPL accounts for 11.60 percent of the total volume of classified loans. This problem has started to be widening with an evil trend of loan embezzlement among the industrial borrowers in our country. Frequent scam series in banking industry is surely a red light and unfortunately the commercial banks are highly surrounded by it. The goal of the study is to analyze the impact of non-performing loan (NPL) on profitability where in this study considered net interest margin (NIM). This paper attempts to find out the time series scenario of non-performing loans (NPLs), its growth, provisions and relation with banks profitability by using some ratios and a linear regression model of econometric technique. The empirical results represent that non-performing loan (NPL) as percentage of total loans on listed banks in Dhaka Stock Exchange (DSE) is very high and they holds more than 50 % of total non-performing loans (NPLs) of the listed 30 banks in Dhaka Stock Exchange (DSE) for year 2008 to 2013. Moreover it is one of the major factors of influencing banks profitability and it has statistically significant negative impact on net profit margin (NPM) of listed banks for the study periods.

Keywords: Net Profit Margin (NPM), Classified Loan to Total Loan (CLT), Interest Margin (IM), Loan Deposit Ratio (LDR), Bad Debt (BD), Dhaka Stock Exchange (DSE)

1. Preamble

The banking system of Bangladesh has been going through a continuous process of development since the 1990s. At the moment the number of banks operating in Bangladesh stand at 56, all of which are under the purview of the Central Bank of Bangladesh, Bangladesh Bank. In the last ten years or so, there has been rapid growth in the banking sector with many new banks operating in the country for the first time.

Given that the growth in the financial sector is a significant part of the GDP growth in Bangladesh, the banking sector requires close monitoring in terms of performance as well as compliance. Although the Central Bank does an excellent job of the former, there has not been any comprehensive industry-wide banking performance measurement.

Ever since Bangladesh became a signatory to the Millennium Development Goals (MDGs) of the United Nations, the economic policies of the Bangladesh Government have been focused on two things: economic growth or more precisely growth of the GDP and further integration into the international financial system. In order to achieve the latter, Bangladesh Bank has been following a more modernized approach towards developing the Monetary Policy.

One of the features of the Monetary Policy goals of Bangladesh Bank has been a greater control of the financial system. In order to achieve that, the banking industry has been streamlined into compliance of the regulatory body of the Bangladesh Bank. The financial system has been centralized and modernized in order to create a more accurate picture of the economic situation of the Bangladesh economy.

The study selects only listed banks in Dhaka Stock Exchange (DSE) where the sector consists of 30 Banks from

the year 2008 to 2013. The performance of the banks is depending on the non-performing loans and default loans. This requires more analysis on the performance of the banks where this listed banks correlated to the stock market performance.

The goal of this study is to analyze the situation about the non-performing loans in the banking sector of Bangladesh Stock Exchange which would measure the banking. However, caution is required in when considering any predictions- the future is always uncertain. However, the analysis provided in measuring the current performance would be indicative of the actual performance of the individual banks.

2. Literature Review

The Banking system in Bangladesh is depending on the liquidity, profitability and performance of the Banks. But the situation created by the banks' lending decision which is very important issue for the banks because it determine the future profitability and performance of the bank after providing loans to the customer where a portion goes into bad debt. Gradually, the bad debt called as a default in different cases. Recently banks are becoming more and more conscious in customer selection to avoid the negative impact of bad loan or non-performing loan. The issue of nonperforming loans (NPLs) has gained increasing attentions in the last few decades. Amounts of bad loans are alarmingly increasing in not only the developing and under developed countries but also in developed countries.

The gross domestic product (GDP) growth is inversely related to non-performing loans, suggesting that an improvement in the real economy translates into lower non-performing loans. It is also found that banks which charge relatively higher interest rates and lend excessively are likely to incur higher levels of non-performing loans (Khemra, Saba, & Pasha, 1987).

The banks' lending policy could have crucial influence on non-performing loans. A default is not entirely an irrational decision. Rather a defaulter takes into account probabilistic assessment of various costs and benefits of his decision. Lazy banking' critically reflects on banks' investment portfolio and lending policy (Reddy & Mohan, 2003); (Sinkey, 1991) and (Dash, 2010).

The immediate consequence of large amount of NPLs in the banking system is bank failure as well as economic slowdown. The causes of nonperforming loans are usually attributed to the lack of effective monitoring and supervision on the part of banks, lack of effective lenders' recourse, weaknesses of legal infrastructure, and lack of effective debt recovery strategies (Adhikary, 2006). There is no global standard to define non-performing loans at the practical level. Variations exist in terms of the classification system, the scope, and contents. Such problem potentially adds to disorder and uncertainty in the NPL issues. Non-performing loans have non-linear negative effect on banks' lending behavior (Hou, 2001).

Non-Performing Loans (NPLs) are regressed on three sets of factors in terms of credit, banks size induced risk preference and macroeconomic shocks. The panel regression models show the terms of credit variables to be significant. The estimated coefficient on changes in cost of credit because of expectation of higher interest rate is positive. On the contrary, horizon of maturity of credit, better credit culture, and favorable macroeconomic and business conditions decrease the NPLs (Ranjan & Dhal, 2003).

Profit efficiency of large commercial banks is by accounting for non-performing loans. Although non-performing loans are negatively related to banks' profit efficiency, it is not statistically significant (Fan & Shaffer, 2004).

Pre-election has an influencing power in the regulatory side of the financial sector. The Government and Bangladesh Bank appear to be under pressure from certain quarters due to this. This becomes evident with the relaxation of the guidelines issued by Bangladesh Bank on defaulters accessing fresh loans. This is clearly not an easy environment to operate in and specific steps should be taken to prevent the situation from further deteriorating and undermining the banking sector (Wallich, 2006).

An empirical result of econometric model based on a study on Guyana show that GDP growth is inversely related to non-performing loans, suggesting that an improvement in the real economy translates into lower non-performing loans. We also find that banks which charge relatively higher interest rates and lend excessively are likely to incur higher levels of non-performing loans (Khemraj & Pasha, 2006).

The presence of an alarming amount of NPLs both in the Nationalized Commercial Banks (NCBs) and in the Development Financial Institutions (DFIs), along with maintenance of inadequate loan loss provisions, diminishes the overall credit quality of Bangladesh. Poor enforcement of laws relating to settlement of NPLs, followed by insufficient debt recovery measures on the part of the banks, has also aggravated the financial malaise (Adhikary, 2007).

The loan performance is put into relation with macroeconomic indicators such as nominal interest rate, inflation rate, change in real GDP, economic growth, unemployment, and the change in terms of trade. One of the problems of such approach, taking macroeconomic variables as exogenous is that they are concurrently affected by a distress in the banking sector (Foglia, 2008).

In making lending decisions, banks are assumed to react differently to NPL ratios above or below a threshold. With NPLs above the threshold has an adverse effect on lending. Bank's lending behavior could restrain economic activity, especially in periods of stress when NPLs are high (Tracey, 2011); (Sinkey & Greenawalt, 1991).

Non-performing loans are increasing due to lack of risk management, which threatens the profitability of banks. This study provides suggestion that banking sector can avoid their non-performing loans by adopting methods suggested by the central bank of perspective country (Haneef & Riaz, 2012).

All the selected independent variables (Real GDP per Capita, Inflation, and Total Loans as independent variables) have significant impact on the depended variable(Non-Performing Loan Ratio), however, values of coefficients are not much high. Banks should control and amend their credit advancement policy with respect to mentioned variables to have lower non-performing loan ratio (Saba, Kouser, & Azeem, 2012); (Dash, 2010).

To bit simultaneous equation regression results clearly indicate that higher non-performing loan reduces cost efficiency and lower cost efficiency increases non-performing loans. The result also support the hypothesis of bad management proposed by Berger and De Young (1992) that poor management in the banking institutions results in bad quality loans, and therefore, escalates the level of non-performing loans (Calice, 2012).

The purpose of the study is to identify the actual situation in the banks depending on the net interest margin and non-performing loan. The analysis of the banks is depending on the banking sector in Dhaka Stock Exchange. The limitations for the study are not consideration of all banks operating in Bangladesh or all schedule banks. Further study will be evaluating under the time series and overall industry based analysis.

3. Objectives of the Study

The primary objective of the study is to find out the effect of NPL on profitability of listed commercial banks of Dhaka Stock Exchange (DSE).

The secondary objectives with this study are as follows:

1) To identify the current situation of profitability of listed commercial banks at Dhaka Stock Exchange for year 2008 to 2013.

2) To explore the significance of relationships between the variables related to Non-Performing Loan (NPL) & Profitability.

3) To suggest a set of remedial measures through logical arguments.

4. Research Methodology

4.1 Sources of Data

Secondary data has been used for the study. For the analysis, 30 listed commercial banks i.e. AB Bank Limited, Al-Arafah Islami Bank, Bank Asia Limited, BRAC Bank Limited, City Bank, Dhaka Bank, Dutch-Bangla Bank, Eastern Bank, Export Import (Exim) Bank of Bangladesh, First Security Islami Bank Limited, ICB Islamic Bank Limited, IFIC Bank, Islami Bank, Jamuna Bank Limited, Mercantile Bank Limited, Mutual Trust Bank Limited, National Bank Limited, National Credit and Commerce Bank Limited, One Bank Limited, Premier Bank Ltd., Prime Bank, Pubali Bank, Rupali Bank, Shahjalal Islami Bank Ltd., Social Islami Bank Limited, Southeast Bank, Standard Bank Limited, Trust Bank Limited, United Commercial Bank Limited and Uttara Bank are considered as our sample. For this study, data has been collected from the annual reports of the selected banks, survey report & some confidential information from BB library. The collected data has been processed & analyzed manually & with the electronics device.

4.2 Hypotheses of the Study

Ho: there is no significant impact of Non-Performing Loan (NPL) on Profitability (Net Interest Margin).

H1: There is significant impact of Non-Performing Loan (NPL) on Profitability (Net Interest Margin) of listed commercial bank at Dhaka Stock Exchange (DSE).

4.3 Tools and Technique

Hypotheses have been tested with correlation, regression & ANOVA by using SPSS software.

5. Discussion and Analysis (Test of Hypotheses)

In this regression analysis, we take net profit margin as dependent variable, classified loan to total loan, interest margin, loan deposit ratio & bad debt as independent variable. Definitely these all are not all variables of determining profit but there has some other variables of determining profit.

1) **Independent variables:** Classified Loan to Total Loan (CLT), Interest Margin (IM), Loan Deposit Ratio (LDR) & Bad Debt (BD).

2) **Dependent variable:** Net Profit Margin (NPM).

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.791[a]	.626	-.870	4.949

a. Predictors: (Constant), CLT, IM, LDR, BD

The multiple regression equation is given below according to our problem:

$\hat{Y}$ (NPM) $= a+\beta_1Ke+\beta_2Ki+ \beta_{3KJ} + \beta_{4km} +\text{\euro}$					
Coefficients[a]					
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	-52.032	73.349		-.709	.607
IM	.051	1.205	.060	.043	.973
LDR	.688	1.280	.738	.537	.686
BD	.231	1.593	1.472	.145	.908
CLT	-.186	1.480	-1.266	-.125	.921

a. Dependent Variable: NPM

Using SPSS software we have found the value of multiple regression equation shown below:

$$\hat{Y}= -52.032+0.051ke+0.688ki+0.231kj-0.186km$$

We know the actual multiple regression equation is $\hat{y}$ (NPM) $=a+\beta_1Ke+\beta_2Ki+ \beta_{3kj} + \beta_{4km} +\text{\euro}$ where, a denotes the constant, β_1 is the slope or coefficient of interest margin (Ke), β_2 is the slope or coefficient of loan deposit ratio(Ki), β_3 is the coefficient of bad debt ratio & β_4 is the coefficient of classified loan to total loan and $\text{\euro}$ is the error which accounts for the variability in $\hat{y}$ that can't be explained by the linear effect of the 4 independent variables.

In the above calculated multiple regression equation,

$$a = -52.032, \beta_1 = 0.051nd, \beta_2 = 0.688, \beta_3 = 0.231 \ \& \ \beta_4 = -0.186$$

This multiple regression equation reveals that $\hat{y}$ (Net profit margin) is dependent variable. Classified loan to total loan, interest margin, loan deposit ratio & bad debt are the independent variables

If the coefficients are 0, then we may conclude that the Net profit margin will be -52.032 regardless of the amount of Classified loan to total loan, interest margin, loan deposit ratio & bad debt .The coefficient β_1=.051 expresses that if the interest margin increases by 1 percent, Net profit margin will also be increased by .051 % because of existing a positive relationship between interest margin & net profit margin along with the condition that the other things especially the other independent variables remain same.

The coefficient β_2= .688 expresses that if the loan deposit ratio increases by 1 percent, Net profit margin will also be increased by .688 % because of prevailing positive relationship between the loan deposit ratio & Net profit margin along with the condition that the other things especially the other independent variables remain same

The coefficient β_3= .231 expresses that if the bad debt increases by 1 percent, Net profit margin will also be increased by .231 % because of prevailing positive relationship between the bad debt & Net profit margin along with the condition that the other things especially the other independent variables remain same

The coefficient β_4= -.186 expresses that if the classified loan to total loan increases by 1 percent, Net profit margin will also be decreased by .186 % because of prevailing negative relationship between the classified loan to total loan & Net profit margin along with the condition that the other things especially the other independent variables remain same.

In the above calculated multiple regression equation,

$$a = -52.032, \beta_1 = 0.051nd, \beta_2 = 0.688, \beta_3 = 0.231 \ \& \ \beta_4 = -0.186$$

This multiple regression equation reveals that ŷ (Net profit margin) is dependent variable. Classified loan to total loan, interest margin, loan deposit ratio & bad debt are the independent variables

If the coefficients are 0, then we may conclude that the Net profit margin will be -52.032 regardless of the amount of Classified loan to total loan, interest margin, loan deposit ratio & bad debt .The coefficient β_1=.051 expresses that if the interest margin increases by 1 percent, Net profit margin will also be increased by .051 % because of existing a positive relationship between interest margin & net profit margin along with the condition that the other things especially the other independent variables remain same.

The coefficient β_2= .688 expresses that if the loan deposit ratio increases by 1 percent, Net profit margin will also be increased by .688 % because of prevailing positive relationship between the loan deposit ratio & Net profit margin along with the condition that the other things especially the other independent variables remain same

The coefficient β_3= .231 expresses that if the bad debt increases by 1 percent, Net profit margin will also be increased by .231 % because of prevailing positive relationship between the bad debt & Net profit margin along with the condition that the other things especially the other independent variables remain

The coefficient β_4= -.186 expresses that if the classified loan to total loan increases by 1 percent, Net profit margin will also be decreased by .186 % because of prevailing negative relationship between the classified loan to total loan & Net profit margin along with the condition that the other things especially the other independent variables remain.

The T-test is used to determine whether each of the individual independent variable is significantly related to the dependent variable. In this model, a T-test can be conducted to determine the significance of each of the individual parameters (ke, ki, kj & km).

In case of ANOVA (Analysis of variance), the total sum of squares can be divided into two components: the sum of squares due to Regression (SSR) and the sum of squares (SSE) due to Error as shown below:

ANOVA[b]						
	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	41.006	4	10.252	.419	.803[a]
	Residual	24.494	1	24.494		
	Total	65.500	5			

a. Predictors: (Constant), CLT, IM, LDR, BD

b. Dependent Variable: NPM

$$SST = SSR + SSE$$

Where, SST = Total sum of squares = Σ (Yi-Ÿ)

SSR = sum of squares due to regression = Σ (Ŷ-Ÿ)

SSE = sum of errors due to error = Σ (Yi- Ŷ)

The analysis of variance part shows the three values for our selected problem with two independent variables (Ke, Ki, kj & km): SST = 65.500, SSE = 24.494 and SSR = 41.006.The value of SST is same whether in case of one independent variable or in case of two independent variables because it doesn't depend on Ŷ, but SSR increases and SSE decreases when a second independent variable is added {say for, interest margin (Ki)}. The implication is that the estimated multiple regression equation –provides a better fit for the observed data.

Adding more independent variables (for instances, loan deposit ratio & bad debt) cause the prediction errors to become smaller, thus reducing the sum of squares due to error (SSE) because SSR = SST-SSE when SSE becomes smaller.

The F-test is used to determine whether a significant relationship exists between dependent variable named Net profit margin and the set of all independent variables such as Ke, ki, kj   and Km expressed as the classified loan to total loan, interest margin, loan deposit ratio & bad debt   respectively; we will refer to the F-test as the test for overall significance.

In this ANOVA model, the hypothesis for the F-test involves the parameters of the multiple regression models:

$$H_0 = \beta_1 = \beta_2 = \beta_3 = \beta_4 = 0$$

$$H1 = \beta_1 \text{ and or } \beta_2, \beta_3 \text{ \& } \beta_4 \text{ is not equal to zero.}$$

If H_0 is rejected, we have enough evidence to deduce that two of the parameters are not equal to zero and that the overall relationship between NPM ($\hat{Y}$) and other four independent variables (Ke, ki, kj & Km) is significant. However, if H_0 is accepted, we don't have the sufficient evidence to deduce that a significant relationship exists between dependent and independent variables.

Before interpreting the F-test, we need to know the concept of Mean Square. A mean square is a sum of square dividend by its corresponding degrees of freedom. In the multiple regression models, SST has (n-1) degrees of freedom, SSR has p (number of independent variables) degrees of freedom and SSE has (n-p-1) degrees of freedom. Hence, the mean square due to regression (MSR) is SSR divided by p and the mean sum of square due to error (MSE) is SSE divided by (n-p-1).

If H_0 is accepted, MSR provides an unbiased estimate of σ^2, and the value of MSR or MSE becomes larger. To determine how large values of MSR/MSE must be to reject H_0, we make use of the fact that if H_0 is true and the assumptions about the multiple regression model are valid, the sampling distribution of MSR/MSE is an F-distribution with p degrees of freedom in the numerator and (n-p-1) in the denominator. The summary of F-test is given below:

$$F = MSR/MSE = 0.419/0.803 = 0.52179$$

With a level of significance $\alpha = 0.05$, we reject H_0 and infer that there is a significant relationship exists between Total net profit margin & all the independent variables)

The p-value (sig.) in the last column of the ANOVA table also indicates that we can reject H_0 because the P-value is less than $\alpha = 0.05$.

As written earlier, the mean square error renders an unbiased estimate of σ^2, the variance of the error term $\mathbb{C}$. referring to ANOVA table, is the standard deviation of the error term. The standard deviation is called the Std. Error of the Estimate ($\mathbb{C}$) found from the process as shown below:

$\sqrt{MSE} = 4.949$ which is Std. Error of the Estimate ($\mathbb{C}$) shown in the last column of model summary table described earlier.

6. Recommendation

From the analysis we can interpret that, there is a significant relationship exists between Total net profit margin & all the independent variables: Classified Loan to Total Loan (CLT), Interest Margin (IM), Loan Deposit Ratio (LDR) & Bad Debt (BD).

Loans may become of problem nature for various reasons. Some quantitative & qualitative causes are given below:

➢ Excessive loan expansion for getting high rate of profit;

➢ Ambitious lending of large sized loans to overpower the competitors;

➢ Providing loans beyond the repayment capacity of the borrower

➢ Sanctioning loans without adequate collateral

➢ Accepting overvalued collaterals in excess of market price;

➢ Repayment plan not clear or not stated on the face of the note;

➢ Failure to receive borrower's financial statement;

➢ Inadequate professionally capable persons to handle loan cases;

➢ Loan to a new business with inexperienced owner;

➢ Disbursement of funds before documentation finished;

In order to control non-performing loan, banks need to be very careful about the financial discipline of the borrower. Banks can undertake the following steps to reduce non-performing loan:

➢ Not making loan without proper credit analysis: banks should not make loan without conducting proper credit analysis;

➢ Additional collateral is required when the value of the previous has decreased;

➢ According to loan policy, banks have specific limits for specific type of loan, loan officer should not cross that limit;

- ➢ Loan supervision and review should be conducted in regular basis;
- ➢ Before sanctioning loans, all the documents related to the loan should be collected and preserved;
- ➢ Banks should not sacrifice the safety of the fund to get extreme profit from risky investment.in many cases, dishonest borrowers utilize loan not in the purpose stated in the agreement but in the purpose of consumption or in other types of risky investment. Hats why bank should restrict this type of diversion of loan policy, which reduce non-performing loan.

7. Conclusion

As lending is the most profitable investment for commercial banks, non-performing loan has effect on profitability of the commercial banks. In this study, we tried to show the impact of non-performing loan on banks profitability. It's time to work with non-performing loan as the funds that are given to the borrowers as loans must be safe and are recovered and when due. Banks do business with depositor's money, if banks can't get depositors fund when they want, there might be a vulnerable situation in the industry. Public may lose confidence from the bank, which may create run on the bank. As a result profitability of the bank can be negatively affected. The suggestions given above can be taken into consideration to reduce non-performing loan. Also as the mother bank of the country, Bangladesh bank has some role to play to ensure sound environment in the banking industry.

References

Abdel, K. B., Neila, B. T., & Sana, J. (2007). Does bank supervision impact nonperforming loans- cross-country determinants using aggregate data?

Adhikari, B. K. (2007). *Non-performing Loans in the Banking Sector of Bangladesh: Realities and Challenges*. Bangladesh Institute of Bank Management (BIBM).

Chowhdury, T. A., & Raihan, A. (2000). *Realities and Challenges of NPLs in Bangladesh*. Bangladesh Institute of Bank Management (BIBM).

Dash, M. K. (2010). The Determinants of Non-Performing Assets in Indian Commercial Bank: An Econometric Study.

Haneef, S., & Riaz, T. (April 2012). Impact of Risk Management on Non-Performing Loans and Profitability of Banking Sector of Pakistan. *International Journal of Business and Social Science, 3*(7).

Kothari, C. R. (1985). *Research Methodology* (2nd ed.). New Delhi.

Malhotra, N. K., & Dash, S. (2011). *Marketing Research* (6th ed.).

Petersson, J. (2004). Non-Performing Loans: The markets of Italy and Sweden.

Rahman, Q. M. (2012). All about non-performing loan: The Bangladesh scenario.

Rajan, R., & Sarat, C. D. (2003). Non-performing Loans and Terms of Credit of Public Sector Banks in India: An Empirical Assessment.

Saba, I., Kouser, R., & Azeem, M. (2012). Determinants of Non-Performing Loans: Case of US Banking Sector.

Sinkey, J. F., & Mary, B. G. (1991). Loan-Loss Experience and Risk-Taking Behavior at Large Commercial Banks. *Journal of Financial Services Research*. https://doi.org/10.1007/BF00127083

Socuvkova, A. P. (2012). Nonperforming Loans in China: Do We (Still) Need to Worry?

Tracey, M. (2011). The Impact of Non-performing Loans on Loan Growth: An econometric case study of Jamaica and Trinidad and Tobago.

Wallich, C. I. (2006). Status of Non-performing Loans in Banking Sector in Bangladesh.

Yixin, H. (2001). The Non-performing Loans: Some Bank-level Evidences. *Journal of Banking and Fnance*.

Copyrights