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**RELATIONSHIP BETWEEN NON-PERFORMING LOANS AND
MACROECONOMIC FACTORS WITH BANK SPECIFIC
FACTORS: A CASE STUDY ON LOAN PORTFOLIOS – SAARC COUNTRIES
PERSPECTIVE**

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ABSTRACT

Financial stability is considered as a pre requisite for the sustained and rapid economic progress for any economy. Among various indicators of financial stability, banks' non-performing loan assumes critical importance since it reflects on the asset quality, credit risk and efficiency in the allocation of resources to productive sectors. Non-performing loans has become a concerning issue for banking sector in recent times. This study attempted an empirical analysis of the non-performing loans of a SAARC country such as Bangladesh and investigated the response of non-performing loans to macroeconomic with bank specific factors with multiple regression and correlation matrix analysis aiming to find out the most significant variables affecting non-performing loan as well as correlation among factors that may have an Influence on non-performing loans.

With respect to macroeconomic factors, this study focuses a broad area showing the relationship between non-performing loans to macroeconomic factors such as annual growth rate of gross domestic production(GDP), real interest rate, inflation rate, public debt as percentage of gross domestic production etc. With respect to bank specific factors this study shows how non-performing loans response with the changes of the bank specific factors such as growth in loan, return on equity, return on assets, loan to asset ratio, loan to deposit ratio, Total capital to total asset ratio, operating expense to operating income ratio, total liabilities to total asset ratio, non-interest income to total income ratio.

In a nutshell, total thirteen variables (four macroeconomic factors and nine bank specific factors) have been considered crucial factors to have a profound impact on the variation of the gross non-performing loan to total advances ratio.

Thereafter the empirical study is analyzed with secondary data collected from some selected commercial banks of Bangladesh and compared with other SAARC countries. The asset base of the scheduled commercial banks is also considered as a yardstick of comparative ranking of the commercial scheduled banks in Bangladesh.

Key words: Non Performing Loan, SAAR Countries, Public Debt, Gross Domestic Product , Commercial banks

INTRODUCTION

Non-performing loan can be defined as a form of financial assets from which the banks is failed to receive interest and or installment payments according to the structured schedule. In another words, when a loan no longer generates income for the bank as well as cease to perform in accordance with the loan agreement between the bank and borrower, it can be stated as non-performing loan. Existence of the non-performing loan can be felt with the deterioration of the quality of the loan portfolio. The proportion of non-performing loans has increased in the banking sector, signaling the poor health and lack of good governance in one of the economy's most vital sectors. A non-performing loan is in a default or close to being in default. Another name of non-performing loan can be stated as problem loan. Many loans become problem loan after being in default for 90 days, but this can depend on the contract terms.

Choudhury et al. (2002: 21-54) state that the nonperforming loan is not a "uniclass" but rather a "multiclass" concept, which means that NPLs can be classified into different varieties usually based on the "length of overdue" of the said loans. NPLs are viewed as a typical byproduct of

financial crisis: they are not a main product of the lending function but rather an accidental occurrence of the lending process, one that has enormous potential to deepen the severity and duration of financial crisis and to complicate macroeconomic management (Woo, 2000: 2).

The profitability and sustainability of banks cannot be ensured without having proper flow of appropriate interest income coming from the lending function of banks. NPLs dishearten the lending policy of banks as banks no longer are able to generate appropriate interest income from their classified loan. NPLs also hurt the reserve provision of the banks in a sense that banks have to keep away a portion of income with a view to forming a loan loss reserve to cover the bad debt. Erosion of capital also occurs with the existence of NPLs. Financial health of the banks has become fragile along with questionable and alarming too due to the rising trend of non-performing loan in banking sector. This default culture phenomenon of the borrowers urges the banking system of a particular economy to take proactive actions to deal with such a crisis.

Some macroeconomic and bank specific factors are contributing to rise in the

classified loan of the banking system. With respect to macroeconomic factors, annual growth rate of GDP, real interest rate, inflation rate and public debt as a percentage of GDP are notice worthy where with respect to bank specific factors, growth in loan, return on equity, return on assets, loan to asset ratio, loan to deposit ratio, Total capital to total asset ratio, operating expense to operating income ratio, total liabilities to total asset ratio, non-interest income to total income ratio are too.

Gross Domestic Production (GDP) can be defined as the measurement of the total market value of the goods or services produced by the economy of a particular country as well as total income earned by the people living at that country . High rise of GDP implies that economy is performing well coupled with the increase of income of the people. Borrowers with the rising trend of income indicate that they would be able to pay off the loan. Annual growth of GDP would bring smile on the banks as they can implicitly be assured that lending function of banks would work effectively.

Real interest rate can be defined as the interest rate adjusted for inflation. In an inflationary environment, real interest rate

actually measures the true cost of borrowing. If borrowers find that interest rate has risen, they take a loan with an intention that it would not be repayable due to the rising cost of borrowing. Inflation and interest rate often work simultaneously. Interest rate also follows upward trends during the time of high inflation. Borrowers borrow money from bank for investment purpose. If they feel that inflation has risen (leading to reduce the purchasing power) they would reluctant for the repayment of the loan as the investment income coming from the utilization of that loan is no longer compensating the reduction in the purchasing power in an inflationary environment. High inflation and interest rate induce to increase the willful default nature of the borrowers.

Public debt can be stated as the borrowings and repayments during a particular year by the government of a country. It is form a of financial obligation incurred by the government. Public debt may be internal or external. Government goes for increased public debt to meet up the budget deficit. High public debt as a percentage of GDP implies that government is having with large burden of loan from the banking system leading to reduce the bank's level of advances.The

relationship between the public debt crisis and bank crisis and revealed that in most cases banking crisis advanced or emerged alike with public debt crisis. Deterioration in public finance forms a threshold in terms of the market rating of credibility for banks and thus, banks have to continue their operations under the pressure of liquidity. In such cases, banks limit their loan placements and since loan customers cannot renew their debts, the ratio of nonperforming loans shows an increasing trend (Reinhart and Rogoff (2010)).

Growth in loan by the banks implies that high level of loan disbursement to the wrongful borrowers leads to high level of defaults of loan.

Return on equity and return on assets indicates the efficiency of banks in generating its income by using equity and assets. The more a bank is well diversified and sophisticated in making its investment policy, the more it would be able to have a satisfactory return from the usage of its equity and assets. Efficiency in the management as well as the implementation of sophisticated lending policy facilitates the rise of return and also cease of loan being non-performed. Thus high return on equity and high return on assets show an inverse relation with non-performing loan. Banks' profitability depends on the risk-

exposure behavior of banks. As highly profitable banks have fewer incentives to engage in high-risk activities, ROA and ROE are expected to display a negative sign with respect to non-performing loan.

Capital denotes to as the net worth of the company. The capital-to-asset ratio measures whether a company has adequate capital to support its assets. This ratio measures the solvency of the banks. Low-capitalized banks are prone to an increase of non-performing loans. The rationale behind this hypothesis is that bank manager with low capitalization are inclined to increase the riskiness of their loan portfolio motivated by moral hazard incentives, thus leading to have a negative relation between bank non-performing loan and capital to asset ratio.

There is a relation between cost inefficiency and non-performing loan of a bank. Cost inefficiency of a bank can be measured by the operating expense to operating income ratio. NPL will enhance with high operating cost or low cost efficiency. An efficient bank will be prudent in managing the cost structure of the bank that may lead to obtain the cost efficiency. Inefficient banks fail to screen and monitor the borrowers properly. That's why banks with high operating

expense to operating income ratio face higher levels of non-performing loans.

Too much disbursement of loan with respect to asset and deposit is also regarded as one of the most important causes of non-performing loans. This behavior of banks demonstrates that the aggressive lending behavior of the banks. More exposure of banks to loans without proper screening the borrowers lead to enhance the level of non-performing loans. Therefore, we can conclude that there exists a positive relationship between non-performing loans and loan to deposit as well as loan to asset ratio.

High non-interest income of banks indicates that banks are too much diversified in investing funds to the sectors apart from lending. Diversified banks are not too much dependent on interest income rather give concentration on investment in multiple assets which may decrease the levels of non-performing loan.

Total liabilities to total asset ratio measures the level of leverage of the banks. Excessive risk is taken by banks with the increase of leverage and therefore has more NPLs. It is expected that there exists a positive effect of leverage on NPLs.

The proportion of non-performing loans has increased in the banking sector,

signaling the poor health and lack of good governance in one of the economy's most vital sectors. NPL rose to 9.7 percent at the end of December 2014 from 8.9 percent at the end of December 2013. Banks must take tough measures against default borrowers. There is no logic in sanctioning new loans to the default organizations. The reasons for the increase in reported NPL were, mainly, due to the withdrawal of a one-time relaxation of the loan rescheduling procedure, which was given in 2013. The major portion of the non-performing loans or default loans are with the SCBs. The central bank report reveals that 22.2 percent of the total loans of SCBs became NPL, while it is 4.9 percent for the private commercial banks (PCBs), 32.8 percent for specialized banks (SDBs) and 7.3 percent in the foreign commercial banks (FCBs). The NPL to total loans ratios of 5 state-owned commercial banks (SCBs) ranged between 10.31 percent and 53.32 percent, whereas it was between 10 percent and 32 percent in calendar year 2013 (Source: Financial Stability Report 2014 released by Bangladesh Bank).

Bangladesh's banking industry still has a significant flaw in loan recovery procedures as the ratio of non-performing loans is much higher than the international

average, a study has found. The study also said the ongoing political unrest will augment the amount of classified loans in future. On an average, non-performing loans (NPL) were 12.79 percent of total loans as of September, while the internationally accepted tolerable limit is 2-3 percent, according to the study conducted by Bangladesh Institute of Bank Management.

Too much dependence on court for recovering loans is one of the reasons behind the rise in NPL as court procedures are usually lengthy, expensive and cumbersome. The introduction of a stringent loan classification system in 2012 is another reason behind the increase in NPL. One noticeable aspect is the significant difference in NPL across different categories of banks. The percentage of NPL in state-owned and specialized banks is higher than that in private and foreign banks. As of September, the NPL rate was 28.76 percent in state-owned banks, 29.39 percent in specialized banks, 7.30 percent in private banks and 6.02 percent in foreign banks (source:Daily Star, 8th March, 2015).

According to the study of Moh Benny Alexandri and Teguh Iman Santoso (2015) on non-performing loan in Indonesian banking system reveals that

NPL is a measure of a bank (SIZE), the capital adequacy ratio (CAR), the level of bank efficiency (ROA), the growth of gross domestic product (GDP), and the rate of inflation. This research activity emphasizes to find out the influence of internal and external banks factors on the level of non-performing loans (NPL) in the Regional Development Bank (BPD) in Indonesia using panel data regression analysis with period from 2009 to 2013. The object of this study was 26 banks. Results of this study shows that variable ROA has a positive and significant impact on the NPL, SIZE and GDP has a negative but insignificant effect on the NPL, CAR and inflation showed no significant positive effect on the NPL.

Non-performing Loans are influenced by three major sets of macroeconomic and financial factors, *i.e.*, Terms of Credit, Bank size induced risk preferences and macroeconomic shocks. Terms of Credit variables have significant effect on the banks' non-performing Loans in the presence of bank size induced risk preferences and macroeconomic shocks. Moreover, alternative measures of bank size could give rise to differential impact on bank's non-performing loans. In regard to Terms of Credit variables, changes in the cost of credit in terms of expectation of higher interest rate induce rise in NPAs.

On the other hand, factors like horizon of maturity of credit, better credit culture, and favorable macroeconomic and business conditions lead to lowering of NPAs. Business cycle may have differential implications adducing to differential response of borrowers and lenders.(Rajiv Ranjan and Sarat Chandra Dha,2003).

The rest portion of this paper is arranged as follows: the second section discusses the existing literature on the macroeconomic and bank specific factors of NPL in the context of a selected country-Bangladesh belonging to the SAARC countries .The third section describes the data used and the methodology. The fourth section interprets and analyzes the empirical results. Finally, the conclusion will be the last section.

LITERATURE REVIEW

Several studies conducted on non-performing loan in previous times with different researchers of different countries. A sophisticated survey of the previous literature has been provided here with both in global context and SAARC countries context.

Inekwe, Murumba (2013) conducted a study on the relationship between real GDP and non-performing loans in Nigeria

during the period 1995-2009 using Pearson Product-Moment Correlation Coefficient. Findings demonstrate that there is a significant and positive relationship between real GDP and nonperforming loans in the Nigerian banking industry. Here lies the gap between the study of Inekwe, Murumba and us.

Another study on non-performing loan concentrating on Nigerian banking system by Kanu Clementina, PhD and Hamilton O. Isu, PhD(2014) shows that that increase in non-performing loans impacted negatively on the Gross Domestic Product in Nigeria. Again, with respect to inflation rate, when it is high, customers find it difficult to pay their existing loans because of the rising cost of capital leading to positive relationship between inflation rate and non-performing loan. This is consistent with our current study.

There is another study conducted by Olayinka Akinlo and Mofoluwaso Emmanuel (2014) on the determinants of non-performing loan with a macroeconomic model in the banking system of Nigeria. It has been found that economic growth is negatively related to non-performing loan which is also consistent with our present study. They also claims that unemployment, credit to the private sector and exchange rate exert a

positive relation on non-performing loans in Nigeria.

Primary cause of high levels of NPLs is the economic slowdown, which is evident from statistically significant and economically large coefficients on GDP, unemployment and the inflation rate. This is the findings of the study on non-performing loan by BRUNA ŠKARICA (2013). This paper analyses the determinants of the changes in the non-performing loan (NPL) ratio in selected European emerging markets on a panel dataset using a fixed effects estimator for seven Central and Eastern European (CEE) countries between Q3:2007 and Q3:2012.

Research activity of Dimitrios P. Louzis, Angelos T. Vouldis and Vasilios L. Metaxas (2011) on macroeconomic and bank-specific determinants of non-performing loans in Greece banking system states that NPLs can be explained mainly by macroeconomic variables (GDP, unemployment, interest rates, public debt) and management quality. Results of the data claims that macroeconomic variables, specifically the real GDP growth rate, the unemployment rate, the lending rates and public debt have a strong effect on the level of NPLs. Besides, it has been shown that differences in the quantitative impact of macroeconomic factors among loan

categories are evident, with non-performing mortgages being the least responsive to changes in the macroeconomic conditions. Particularly, consumer loans are the most sensitive to changes in the lending rates and business loans to the real GDP growth rate, while mortgages are the least affected by macroeconomic developments.

Shihong Zeng (2012) undertook a study on non-performing Loan in China. He supports that the equilibrium value of the bank NPLs is dependent on micro-economic factors but influenced by macro-economic factors. Micro-economic factors include a bank's internal management; macro-economic factors include the degree of openness to the outside world and government policy. He concludes that with a view to decreasing NPLs in China, the banks' internal management effort must be enhanced.

Research activity of Saoussen Ouhibi and Sami Hammami (2015) on determinants of financial soundness indicators (non-performing loans) of the banking system of the countries of Southern Mediterranean (Tunisia, Morocco, Egypt, Lebanon, Jordan and Turkey) states that there are several factors that lead to the growth or decline of non-performing loans, such as macroeconomic variables. Results of the data analysis shows that the

significant variables affecting the non-performing loans are nominal exchange rate, the consumer price index and the gross capital formation while GDP, FDI, exports, unemployment rate are insignificant. They also concluded that there is a correlation between economic trends and the indicator of financial soundness in the banking system of the countries of Southern Mediterranean.

Intensive research work of Dr. K Sriharsha Reddy (2015) on non-performing loans in emerging economies-case study of India reveals that lending priority on sensitive sectors, size of the bank in terms of assets, capital adequacy ratio and Growth rate of GNP are significant leading to inverse relation with Non-performing Loan.

Analysis of the factors that influence non-performing Loans in Albania focuses on macroeconomic factors demonstrating that interest rate and credit to economy is positively related to non-performing loan while GDP is negatively related to non-performing loan. Albania also has more risk exposure to macroeconomic shocks. These are the findings of the research activity conducted by Doc.Fiqiri, Prof.As. Dr. Ines. Dika and MSc. Gjergj Xhabija in 2015.

Vasiliki Makri, Athanasios Tsagkanos and Athanasios Bellas (2014) conducted a

study on non-performing loan in the banking system of Eurozone. Findings of their analysis reveal that there is a strong correlation between non-performing loan and various macroeconomic factors (Public debt, unemployment and growth rate of GDP) and bank specific factors (capital adequacy ratio, return on equity).

According to the study of Ahlem Selma Messai and Fathi Jouini (2013) on micro and macro determinants of non-performing loans in Tunisia, it has been observed that problem loans vary negatively with growth rate of GDP, profitability of banks assets and positively with the unemployment rate, the loan loss reserve to total loans and the real interest rate.

Munene, H. Nguta and Guyo, S. Huka (2013) undertook a study on factors influencing loan repayment default in Micro-finance institutions in Kenya. They examined that there is a significant relation between the type of business, age of business, number of employees, business profit and loan repayment default.

Rabeya Sultana Lata (2014) conducted a study on non-performing loan and its impact on profitability of state owned commercial banks in the context of Bangladesh. The empirical results represent that NPL as percentage of total loans of SCBs is very high and they hold

more than 50% of the total NPLs of the banking industry for last 8 years. She concluded that there is a significant impact of deposit growth rate, growth rate of NPL and provision growth rate on SCBs profitability.

Tarron Khemraj and Sukrishnalall Pasha (2005) conducted a study in Guyana to ascertain the determinants of non-performing loans in the Guyanese banking sector. They analyzed the sensitivity of non-performing loans to macroeconomic and bank specific factors in Guyana. In particular, it employs regression analysis and a panel dataset covering 10 years (1994 to 2004) to examine the relationship between non-performing loans and several key macroeconomic and bank specific factors.

SIGNIFICANCE OF THE STUDY

The Banking industry of Bangladesh has flourished over the years, making double-digit profit percentages, sustaining growth and surviving cut-throat competition while providing attractive returns to shareholders. The issue of non-performing loans has gained increasing attentions in the last few decades. Non-performing Loans are one of the major causes of the economic stagnation problems in every economy. Each non-performing loan in the financial sector is viewed as an obverse

mirror image of an ailing unprofitable enterprise. Non-performing loans are a reflection of problems in the banking and corporate sectors. Non-performing loans create problems for the banking sector's balance sheet on the asset side. They also create a negative impact on the income statement as a result of provisioning for loan losses. In the worst scenario, a high level of non-performing loans in a banking system poses a systemic risk, inviting a panic run on deposits and sharply limiting

RESEARCH HYPOTHESIS

Macroeconomic factors:

H₁: GDP has a negative impact on Non-performing loan

H₂: Real interest rate has a positive impact on Non-performing loan

H₃: Inflation has positive impact on Non-performing loan

H₄: Public debt as a percentage of debt has a negative impact on Non-performing loan

Bank specific factors:

H₅: Growth in loan has a positive impact on Non-performing loan

H₆: Return on equity has a negative impact on Non-performing loan

H₇: Return on asset has a negative impact on Non-performing loan

H₈: Loan to asset ratio has a positive impact on Non-performing loan

H₉: Loan to deposit ratio has a positive impact on Non-performing loan

H₁₀: Total capital to total asset ratio has a negative impact on Non-performing loan

H₁₁: Operating expense to operating income ratio has a positive impact on Non-performing loan

H₁₂: Total liabilities to total asset ratio has a positive impact on Non-performing loan

H₁₃: Non-interest income to total income ratio has a negative impact on Non-performing loan

RESEARCH OBJECTIVES

This research activity intends to fulfill the following objectives:

1. To find out the significant macroeconomic & bank specific factors affecting non-performing loan.
2. To find out the direction of relationship between non-performing loan and macroeconomic & bank specific factors.
3. To judge whether macroeconomic and bank specific factors have any relation

with each other leading to have multi-collinearity problem.

4. To demonstrate the discrepancies between the initial hypotheses and the results of the data.

5. To provide a comparative analysis of Non-performing Loan of Bangladesh with other SAARC countries.

SCOPE OF RESEARCH

This study provides insight into how the non-performing loans of the banking sector of Bangladesh are influenced by the macroeconomic & bank specific Factor. This research activity is totally confined to the secondary data such as economic data of the respective economy and bank specific data of the respective banks. No psychological phenomenon leading to cause willful defaults is considered.

LIMITATIONS OF THE STUDY

1. Exchange rate as a macroeconomic factor did not incorporate.
2. Extension of study with the categories of non-performing loans by type of loan did not consider in this study.
3. Econometric methods such as dynamic panel incorporating the lagged non-performing loans among the explanatory variables were not considered in this study.

4. Other factors may exert an influence on the variation of non-performing loans that are beyond the current research activity such as funds borrowed for the particular purpose is not used for the same purpose, business failures, project not completed in time, willful defaults, siphoning of funds, fraud, disputes, management disputes as well as mis-appropriation.

RESEARCH FRAMEWORK

- **Data source:** The secondary data has been used to conduct this study of non-performing loan.
- **Data collection and sampling method:** All the data that are pre-requisite to conduct this study has been obtained and calculated from the financial statements of the respective banks. Data of 56 scheduled commercial banks of Bangladesh are not available that's why we have to take a sample of 10 commercial banks listed in the Dhaka Stock Exchanges. Rationale behind the selection of 10 commercial banks is that they constitute approximately 50% of the assets of the banking system of Bangladesh as well as they provide more adequate data compared to others. The data was collected annually from 2010 to

2014 as there was insufficient quality data before those time period.

- **Statistical tools for data analysis** As the current study aims to explore the important determinants of NPA through a study of association between independent and dependent variables so, Multiple Regression and correlation Matrix matches with the intention.
- **Data Analysis Procedure** Empirical data analysis part has been divided into two sections. In the first section, multiple regression analysis has been employed. In the second section, Correlation matrix has been developed.
- **Presentation of variables**
(Refer table 1)

RESULTS AND DISCUSSION OF THE STUDY

Data analysis with Multiple Regression

Multiple Regressions demonstrates following results:

(Refer table 2)

P value is used to test the regression as well as to find out the significant variables affecting the dependent variables. At 5% of significant level, p value is less than .05 for the variables such as public debt as a

percentage of GDP, growth in loan, return on equity, return on assets, total loan to total asset ratio, total loan to total deposit ratio and operating expense to operating income ratio concluding to the fact that these variables are significant ones having an influence on non-performing loans. This result is consistent with the previous studies conducted on non-performing loan. On the other hand, significance F .02240 at 5% significance level implies that the regression analysis as whole is significant indicating that non-performing loans of the banking system of Bangladesh is influenced by the macroeconomic factors and bank specific factors.

The correlation coefficient is 0.6763 showing that there is a moderate positive correlation between the non-performing loans and macroeconomic with bank specific factors. R- square of .4574 implies that 45.74% variation in the percentage change in non-performing loan can be explained by the variation in the financial and macroeconomic factors.

Data analysis with correlation Matrix:

Coefficients of the correlation matrix showing the relationship between NPL and Macroeconomic Factors with Bank Specific Factors are given below:

(Refer table 3)

From the coefficients of the Correlation Matrix it has been found that annual growth rate of GDP and total capital to total asset ratios are positively related with non-performing loan which is contrary to expected sign though supports some of the results of the research activity conducted on non-performing loan in previous research works. Real interest rate, growth in loan, operating expense to operating income ratio and total liabilities to total asset ratio are positively related to non-performing loan which is consistent to our research hypotheses. Public debt as a percentage of GDP, return on equity, return on assets and non-interest income to total income ratio are negatively related to non-performing loan supporting our prior research hypotheses. On the other hand, inflation, loan to asset ratio and loan to deposit ratio show negative correlation with non-performing loan implying that they are contrary to the expected signs.

Summary and comparison of the results at a glance:

(Refer table 4)

It has been observed that there exhibits a conflicting results between multiple regression analysis and correlation matrix. Variables that have been showing a significant relationship with non-performing loans may not support the

results correlation matrix. It has been occurred due to the existence of strong cohesion among independent variables called multicollinearity problem.

Multicollinearity problem

Coefficients of Correlation Matrix that demonstrate the Multi-co linearity problem are given following:

(Refer table 5)

Multi collinearity problem is found as independent variables such as total loan to total asset ratio and total loan to total deposit ratio is strongly correlated with each other. We also can see that there is strong association between return on equity and return on assets. This multicollinearity problem can increase the variance of the coefficient estimates and make the estimates very sensitive to minor changes in the model. The result is that the coefficient estimates are unstable and difficult to interpret. High association among independent variables reduces the impact of individual independent variables to the formation of non-performing loan of the banking system of Bangladesh.

Discrepancies between the initial hypotheses and actual results

(Refer table 6)

Comparative analysis of the non-performing loan of Bangladesh with other SAARC countries (excluding Nepal as data is not available):

(Refer table 1)

Comparative Analysis of NPL between Bangladesh and other SAARC countries:

(Refer figure 1)

(Refer figure 2)

From both figures, we can see that the NPL of Bangladesh is higher than Afghanistan and Bhutan leading to emphasize more for the reduction of NPL of Bangladesh.

(Refer figure 3)

(Refer figure 4)

From the figure 3, we can see that the NPL of Bangladesh is higher than India where from figure 4; a satisfactory result is observing as the NPL of Bangladesh is lower than Pakistan.

(Refer figure 5)

(Refer figure 6)

From the above figures 5 & 6, we can observe that the NPL of Bangladesh is higher than Maldives and Sri Lanka indicating a signal of poor financial health of the banking system of Bangladesh.

FINDINGS OF THE STUDY

1. Among four macroeconomic variables, only one variable such as public debt as a percentage of debt has been found significant in affecting the non-performing loan.
2. Among nine bank specific factors, significant factors affecting non-performing loan are growth in loan, return on equity, and return on assets. Total loan to total asset ratio, total loan to total deposit ratio and operating expense to operating income ratio.
3. Significance F statistic shows that the Regression Model as a whole is significant.
4. 45.74% variation in the percentage change in non-performing loan can be explained by the variation in the bank specific and macroeconomic factors.
5. Correlation coefficient of multiple Regression demonstrates a moderate association between non-performing loan and macroeconomic with bank specific factors.
6. Annual growth rate of GDP, real interest rate, growth in loan, total capital to total asset ratio, operating expense to operating income ratio and total liabilities to total asset ratio are positively related to non-performing loan.
7. Inflation, public debt as a percentage of GDP, return on equity, return on assets, total loan to total asset ratio, total loan to total deposit ratio and non-interest income to total income ratio are negatively related to non-performing loan.
8. Linear relationship among independent variables such as return on equity, return on assets, total loan to total asset and total loan to total deposit ratio poses an association among themselves leading to rise the multi-collinearity problem as well as determination of coefficients with a little uncertain.
9. In a nutshell, significant factors affecting the non-performing loan of the banking system of Bangladesh are public debt as a percentage of GDP, growth in loan, return on equity, return on assets, total loan to total asset ratio, total loan to total deposit ratio and operating expense to operating income ratio.

10. The NPL of Bangladesh is higher than Bhutan, India, Maldives and Srilanka. NPL of Bangladesh is lower than Pakistan.

RECOMMENDATIONS

1. Reduction of non -performing loan requires to investigate the borrower authentically customer to ensure the security of the bank money.
2. Banks should know their customers before granting loans to them, in fact adhering strictly to the 5C's of credit in modern banking practice
3. A diversified portfolio of loan with proper inspection may reduce the non-performing loan.
4. Proper valuation of the collateral is essential.
5. Loan disbursement based on personal undertakings need to be reduced.
6. Banks can introduce incentive programs to encourage the employees in the recovery section to bring down the non -Performing loans.
7. Credit officer must be skilled enough to understand the psychological behavior of the borrowers.

- Regulatory agencies should monitor whether due process and principles of good lending are strictly adhered to by banks and other financial institutions.
- Central bank should introduce policies that can have moderating effects on inflation and lending rates.
- Government should pay their loans on time and insider abuse should be eliminated from the financial system
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CONCLUSION

High ratio of non-performing loans in banking system or rising tendency leads to increase in allowance to be allocated for aforementioned loans and thus, to a decrease in the profitability and capital adequacy ratio of the banks. Considered from the point of economics, increase in non-performing loans, negatively effects economic growth by causing to a decrease in loanable funds (MEHMET İSLAMOĞLU, 2015)

Non-performing loan can enhance the insolvency of banks leading to bank failure. Current study concentrates on empirical analysis of the nonperforming loans of the ten selected commercial banks of Bangladesh and investigates the

response of NPLs to macroeconomic and bank specific factors.

More disbursement of loan exposes bank to more diversified as well as risky borrowers leading to have a positive association between NPLs and total loan to total deposit ratio consistent to my research hypothesis. Bank with better asset base tends to have lower NPLs perhaps owing to their better portfolio diversification or possibly even superior credit risk management techniques. Large asset base may prevent to offset the loss generated from the non-performed loan. Borrowers whose purpose is to take loan from bank with the intention of non-repayment will always default no matter whether the macroeconomic and bank specific variables are favorable or not. The high level of NPLs requires banks to raise provision for loan loss that decreases the bank's revenue and reduces the funds for new lending. NPL of Bangladesh is much higher than other SAARC countries such as India, Bhutan, Maldives and Srilanka except Pakistan. Comparative analysis of NPL of Bangladesh with SAARC countries gives a signal that Bangladesh should more prudent in making sophisticated and proactive policies for the reduction of NPL in the banking system.

Our findings support the previous research activities as public debt as a percentage of GDP, growth in loan, return on equity, return on assets, operating expense to operating income ratio seems to exert a powerful influence on the non-performing loans rate found by both multiple regression and correlation matrix analysis. Multiple regression analysis supports factors such as public debt as % of GDP, growth in loan, return on equity, return on assets, total loan to total asset ratio, total loan to total deposit ratio and operating expense to operating income ratio having an significant impact to the non-performing loan where with correlation matrix supports that real interest rate, growth in loan, operating expense to operating income ratio, total liabilities to total asset ratio, Public debt as a percentage of GDP, return on equity, return on assets and non-interest income to total income ratio showing a significant relationship with non-performing loan. These results are unveiling to the fact that the state of the non-performing loan of the banking system of Bangladesh is highly influenced by the both macroeconomic and bank specific factors. It can be concluded that the regulatory agencies to formulate policies that would reduce the non-performing loan for the betterment of the financial health of the banks.

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LIST OF TABLES

Table 1: Presentation of dependent and independent variables

Symbol	Explanation	Expected sign
Dependent variables: NPL / TLi,t	The ratio of non-performing loans to total loans for bank i in year t.	
Independent variables		
Macroeconomics:		
ΔGDP_{t-1}	Annual growth rate of Gross Domestic Production at period t-1	(-)
RIR _t	Real interest rate at year t.	(-)
IR	Inflation rate	(-)
DEBT	Public debt as % of GDP	(+)
Bank specific factors		
$\Delta\text{Li}_{i,t}$	loan growth for the bank i in year t	(+)
ROE	Return on equity	(-)
ROA	Return on assets	(-)
TL/TA	Total loan to total asset ratio	(+)
TL/TD	Total loan to total deposit ratio	(+)
TC/TA	Total capital to total asset ratio	(-)
OE/OI	Operating expense to operating income ratio	(+)
TLI/TA	Total liabilities to total asset	(+)

	ratio	
NII/TI	Non-interest income to total income ratio	(-)

Table 2: Summary output of Multiregression Analysis

Variables	P value
Δ GDP	0.32787
RIR	0.20842
IR	0.46337
DEBT	0.04449
Δ Li	0.01422
ROE	0.01832
ROA	0.02798
TL/TA	0.01216
TL/TD	0.01949
TC/TA	0.4028
OE/OI	0.0131
TLI/TA	0.57521
NII/TI	0.13309

RO E	-0.28	-0.49	- .04	0.3 6	0.69	0. 3	1 7							
RO A	- 0.21	-0.45	- 0.0 1	0.3 7	0.66	0. 2	0.92 7	1						
TL/ TA	-0.09	-0.17	- .02	0.2 3	0.31	0. 3	0.15 3	0.04	1					
TL/ TD	-0.12	-0.18	- 0.0 2	0.2 5	0.32	0. 0	0.14 1	0.06	0.9 8	1				
TC/ TA	0.03	-0.19	- .06	0.2 3	0.33	0. 0	0.28 5	0.58	- 0.1 9	- 0.17	1			
OE/ OI	0.31	0.13	- .05	- 0.2 1	- 0.25	- .0 7	- 0.14	- 0.23	- 0.0 8	- 0.09	- 0.31	1		
TLA /TA	0.02	-0.08	0.0 8	- 0.2 8	- 0.10	0. 0	0.08 8	- 0.04	0.1 1	0.07	- 0.35	0.0 8	1	
NII/ TI	-0.11	-0.07	- .01	0.0 7	- 0.15	0. 0	- 0.01 3	- 0.03	0.1 5	0.15	- 0.22	0.0 9	- 0.03	1

Table 4: Comparison of results between multiple regression and correlation matrix

	Multiple regression	Correlation Matrix
Significant variables	public debt as % of GDP, growth in loan, return on equity, return on assets, total loan to asset ratio, total loan to total deposit ratio and operating expense to operating income ratio	
Variables satisfying the expected sign		Real interest rate, Growth in loan, operating expense to operating income ratio, total liabilities to total asset ratio, Public debt as a percentage of GDP, return on equity, return on assets and Non-interest income to total income ratio
Significant variables supported by both multiple regression and correlation matrix	public debt as % of GDP, growth in loan, return on equity, return on assets, operating expense to operating income ratio	

Table 5:Coefficients of correlation matrix showing strong association among independent variables.

	TL/TA	ROE
TL/TD	.92	
ROA		.98

(Note:TL=Total Liabilities,TA=Total Assets,TD=Total Deposit,ROE=Return On Equity and ROA=Return On Assets)

Table 6: Discrepancies between initial hypotheses and actual results

Variables	Initial hypothesis(Expected sign)	Actual results	Comment
ΔGDP_{t-1}	(-)	(+)	Inconsistent
RIR _t	(-)	(-)	Consistent
DEBT	(+)	(+)	Consistent
IR	(-)	(+)	Inconsistent
$\Delta Li_{,t}$	(+)	(+)	Consistent
ROE	(-)	(-)	Consistent
ROA	(-)	(-)	Consistent
TL/TA	(+)	(-)	Inconsistent
TL/TD	(+)	(-)	Inconsistent
TC/TA	(-)	(+)	Inconsistent
OE/OI	(+)	(+)	Consistent
TLA/TA	(+)	(+)	Consistent
NII/TI	(-)	(-)	Consistent

Table 7: Comparative data of non-performing loan of SAARC countries

Name of the country	Non-performing loans to total advance ratio (%)			
	2011	2012	2013	2014
Afghanistan	4.7	5.0	4.9	7.8
Bangladesh	5.8	9.7	8.6	9.4
Bhutan	3.9	5.4	7	6.8
India	2.7	3.4	4	4.3
Pakistan	16.2	14.5	13	12.3
Maldives	2.7	2	1.8	1.6
Srilanka	3.8	3.6	5.6	4.2

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Figure 1: NPL of Bangladesh and Bhutan

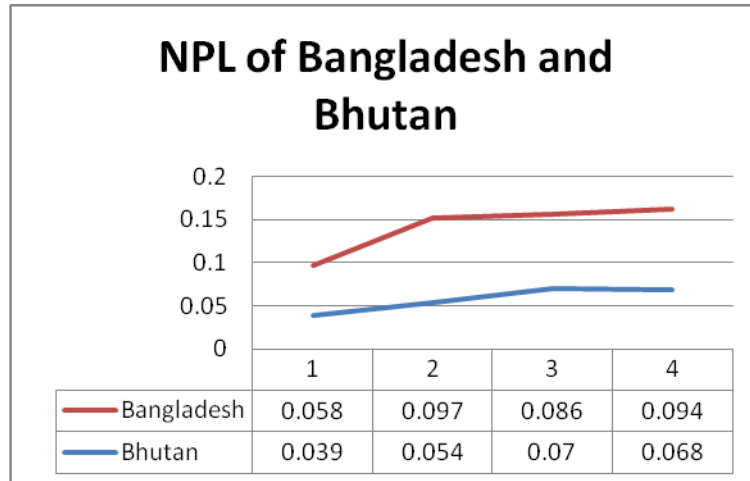


Figure 2: NPL of Bangladesh and Afghanistan

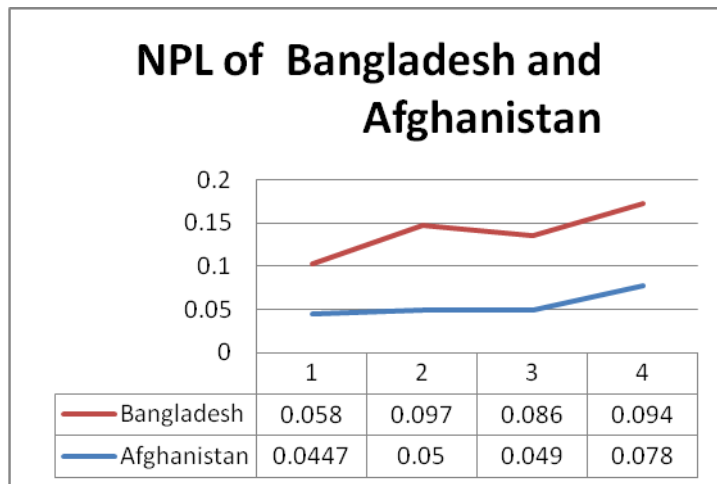


Figure 3: NPL of Bangladesh and India

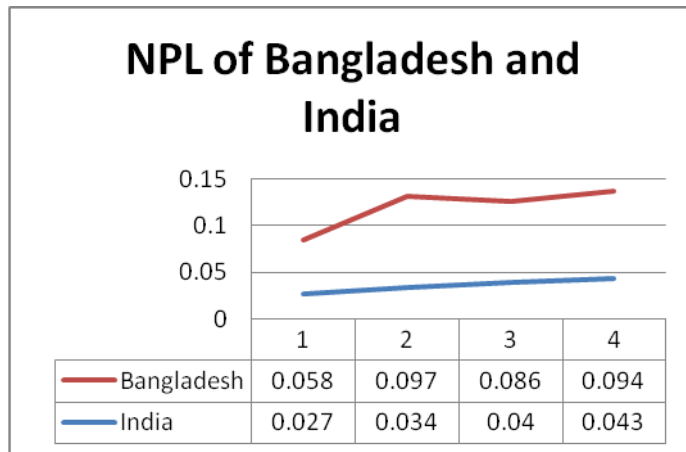


Figure 4: NPL of Bangladesh and Pakistan

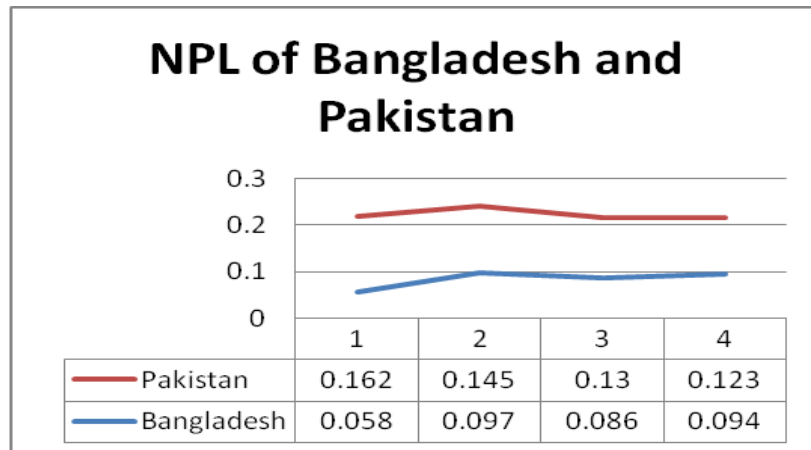


Figure 5: NPL of Bangladesh and Maldives

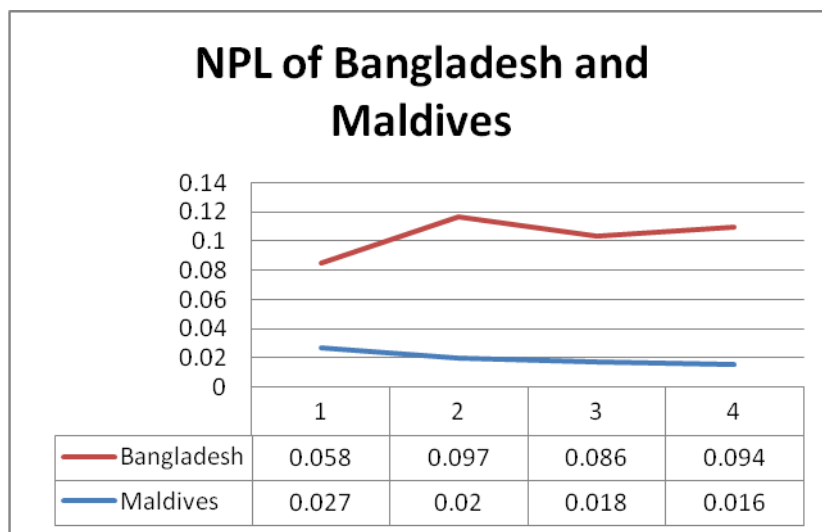


Figure 6: NPL of Bangladesh and Sri Lanka

