Impact of Macro Fundamental Factors on Non-Performing Loan: Evidence from Financial Sector of Bangladesh

Impact of Macro Fundamental Factors on Non-Performing Loans: Evidence from Financial Sector of Bangladesh

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January 13, 2020

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Subject: Submission of Project paper on 'Impact of Macro Fundamental Factors on Non-Performing Loan: Evidence from Financial Sector of Bangladesh

Dear Sir,

It is indeed a great experience for me to prepare the project paper on 'Impact of Macro Fundamental Factors on Non-Performing Loans: Evidence from Financial Institutions of Bangladesh' under your excellent supervision. By using the empirical data, I have tried to find out which factor is the most influential one on stock price volatility by using the OLS based ARDL model. This study will help the financial institutions, investors and government to take a correct decision to some extent while enhancing money supply, providing domestic credits, and investing in the vulnerable stock market of Bangladesh.

I hope that you will find this project worth reading. Please feel free for any query or clarification that you would like me to explain. I hope that the project paper would meet your expectations and standards. I hope you will appreciate my hard work and excuse minor errors. Thanking you for your cooperation throughout the whole period.

Sincerely yours,

_____

Summatun Nasya

ID: 111 152 167

Certification of Similarity Index

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Dr. Md. Qamruzzaman

Associate Professor

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Declaration of the Student

I hereby declare that this project paper entitled “Impact of Macro Fundamental on Non-Performing Loan: Evidence from Financial Institutions of Bangladesh” is a record of an original work submitted to the United International University, conducted between period of October-December of 2019 and done by me under the supervision of Dr. Md. Qamruzzaman, Associate Professor of School of Business and Economics.

The information submitted is true and original to the best of my knowledge. Again, where references of other works have been cited, full acknowledgment has been given. This project work has never been submitted in whole or in part in any other institution for any purpose.

Summatun Nasya

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Acknowledgment

At the very beginning, I want to thanks our Almighty Allah from my heart. Without His blessings, nothing would be possible for me.

Then, I just want to show gratitude to my parents. Actually, the parents are one of the main reasons that I am now in UIU and able to do this kind of project work. They also help me in many ways for completing the project mentally.

After that, before thanking this person, I want to say something about him. In my UIU life, I have dealt with many faculties with their different attitudes and behavior. I can say one thing, I am very fortunate to have this faculty member as my project supervisor who is very committed to his duties, caring and helpful to me throughout the project period. He taught me many new things related to the project with practical demonstrations. Actually, this project paper is mainly based on 'Impact of Macro Fundamental Factors on Non-Performing Loans: Evidence from Financial Institutions of Bangladesh' and it becomes very easy for me to reach my target because of this person. The person I am talking about is none other than, my honorable supervisor, Dr. Md. Qamruzzaman. I will be grateful to him forever.

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Abstract

Introduction:

Having the fastest growing economy in 2019, Bangladesh is moving forward to achieve the goal of becoming a developed country from the developing one. Because of the increasing number of banks and NBFIs along with the advanced facilities, now the financial sector can be considered as quite stronger than before (1990's). However, a significant positive change is required in the financial sector to become a developed country, as it is the foundation of the economy of Bangladesh. As banks contain the largest part of the financial sector, it is crucial to ensure the profitability of banks. While identifying the factors hamper the banks' and NBFIs', non-performing loans are found on the top; which are basically default loans (loans that are non-recovered). Both internal and external economic factors are responsible for the upward movement of NPLs. However, this study is focused on a few macroeconomic variables, which affect the NPLs most and the research is conducted based on data from 1972 to 2017 to get a more reliable finding.

Objective:

Among all the macro fundamental factors, some factors affect NPLs most and some factors affect less. The objective of this study is to determine which factors are more responsible for the movement of non-performing loans on a macro fundamental perspective.

Methodology:

This study is conducted using seven variables; out of which NPL is considered as the dependent variable and BM, DBD, DCP, RE and TO are independent. The unit root test (ADF, PP, and KPSS) is formulated for the purpose of finding stationarity in the time series variables. To determine the positive and negative effect of the independent variables on the dependent variable, the ARDL model is conducted along with ECM and OLS.

Findings:

A long-run relationship between the dependent variable and the other independent variables were found through the Linear ARDL Bound Test. According to the result of the ARDL model, BM was found to be the most significant positive influencer of NPL both in the long run and short-run because of having the largest coefficients; 9.63 (long run) and 1.96 (short-run). Moreover, FDV was found to have the most significant negative relationship with NPL because of having the largest coefficients; -7.91 (long run) and -4.86 (short-run). Most interestingly, except BM, all of the variables were found to have a negative relationship with NPL. In addition, an insignificant negative relationship was found between TO and NPL. The coefficients of TO are; -0.35 (long run) and -0.13 (short-run) express a very little impact on NPL.

According to the residual test, the findings say that these six independent variables are 95.8% responsible for the movement of non-performing loans, which ensures the most reliable outcome.

Real-Life Implications:

The result of this study can assist the Govt., FIs, and investors also. The strong positive relationship between BM and NPL reveals that NPL will tend to increase with the increment of money supply in the economy. Thus the findings of the study can be an alarm for the government to keep the money supply in a limit. The negative relationship between DBD, DCP, and NPL expresses that a decreased amount of domestic credit by the financial sector will increase NPL. So, this result can be helpful for the FIs to realize that there should not be a limit to providing domestic credits. According to the result, an increased amount of remittance decreases the NPL as people will prefer to take fewer loans. So, financial institutions may start to provide loans with less interest and different businesses can take the opportunity of having a huge amount of loans with less interest.

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List of Abbreviation

NPL	Non-performing Loan
BM	Broad Money
DBD	Domestic Credit by Financial Sectors
DCP	Domestic Credit to Private Sectors
FDV	Financial Volatility
RE	Remittance Inflow
TO	Trade Openness
GDP	Gross Domestic Product
ROE	Return On Equity
DSE	Dhaka Stock Exchange
BDT	Bangladeshi Taka
ADF	Augmented Dickey-Fuller
PP	Phillip Perron
KPSS	Kwiatkowski-Phillips-Shin
LM Statistics	Lagrange Multiplier Statistics
ARDL	Autoregressive Distributed Lag
OLS	Ordinary Least Square
ECT	Error Correction Term
RESET	Regression Specification Error Test
SIC	Schwarz Information Criterion
SCB	State-Owned Commercial Banks
DFI	Development Financial Institutions
PCB	Private Owned Commercial Banks
FCB	Foreign Commercial Banks
ROA	Return on Assets
ROE	Return on Equity
CPD	Center for Policy Dialogue
NBFI	Non-Banking Financial Institutions

TA	Total Asset
TL	Total Liabilities
IDLC	Industrial Leasing Company of Bangladesh
PLFS	People's Leasing and Financial Services
MFI	Micro Finance Institutions
NGO	Non-Government Organizations
GB	Grameen Bank
BRAC	Bangladesh Rural Advancement Committee
CPI	Consumer Price Index
LC	Letter of Credit
ATM	Automated Teller machine
BB	Bangladesh bank
VAR	Vector Autoregressive
GMM	Generalized Methods of Moments
GARCH	Generalized autoregressive Conditional Heteroskedasticity
LP	Local Projection Test
IMF	International Monetary Fund
WB	World Bank
BBS	Bangladesh Bureau of Statistics
ECM	Error Correction Model
VECT	Vector Error Correction Test
RER	Real Exchange Rate

CHAPTER I: INTRODUCTION

1.1 Background of the study

Since 1972 Bangladesh has been trying to be developed by ensuring economic growth. Gradually, its economy became strong and it is expected that within 2041, it will be marked as a developed country from the underdeveloped one. For various socio-economic needs, financial institutions have been running successfully by encompassing a huge range of business operations within the financial service sectors including commercial banks, insurance companies, securities firms, and investment banks, non-banking financial institutions, leasing companies, micro-financial institutions, etc. Excessive government intervention, corruptions, managerial inefficiency badly affect the economic development of Bangladesh (Nguyen, Islam, et al. 2011). However, non-performing loans might be a great threat to the development of the country, as economic development largely depends on the bank. Firms' long term sustainability is threatened because of the failure to generate earning from loan and recovering principal (Rifat 2016). Though the financial sector is small and underdeveloped, the banking industry is comparatively more developed and holds a huge percentage of dependency on economic growth.

For many years, banks have been working successfully as the intermediaries between the borrowers and the savers by earning enormous profit from the interest of loans. However, because of the reduction of liquidity and worst macroeconomic condition, sometimes firms and people become unsuccessful to pay and thus defaulting the loans, which are referred to as the Non-Performing Loans (NPL). An increasing amount of non-performing loans may be considered as a warning exponent for any financial industry of the world to impede the banking crisis. Though improper credit policy, lack of monitoring, choosing wrong borrowers are the reasons of arising non-performing loans, some studies prove that macroeconomic factors, which are out of control of the institutions, may have significant impact on the non-performing loans, which are found in the following researches- (Poudel 2013, Škarica 2014, Polodoo, Seetanah, et al. 2015, Soekapdjo, Nugroho, et al. 2018)

Dividend payments, interest rates, investments are affected a lot due to the increment of non-performing loans. Bangladesh Bank shows that Bangladesh's non-performing loans ratio reached 12% in September 2019, which was 11.7% in June, and in the previous year which was 11.9%. In March 2003, it was surprisingly stood at 28%. In this study, it has been tried to expose that how the non-performing loans of the financial sector in Bangladesh are affected by using the determinants- broad money, domestic credit to the private sector, domestic credit by the financial sector, trade openness, remittance, financial volatility.

Scams regarding non-performing loans in Bangladesh:

Sonali Bank is the largest commercial bank, which is owned by the government. Between 2010-2012, Sonali Bank (Ruposhi Bangla Hotel Branch) provided 26.86 billion takas to the Hallmark group, which was considered as illegal. Managing director of Hallmark group, manager of Sonali Bank and the chairman of Hallmark group were found to be as the culprits. Hallmark opened LC in Sonali Bank and some fictitious companies named- Anwara Spinning Mills, Max Spinning Mills and Star Spinning Mills were exposed by the Hallmark to the Sonali Bank whose were supposed to pay the LC amount later. These fictitious companies presented some fake papers to the bank and thus bank provided a huge amount as Hallmark was their reliable client. Later, as this repayment was not made, it became a non-performing or default loan of the bank and for which Sonali Bank suffered a lot. The fact is, still Sonali Bank is suffering. Now, 1210 branches are open, out of which the financial condition of 20 number of branches is repugnant because of having 84% bad loans. In addition, another 5 number of branches hold 54% NPL.

Starting in 1989, Basic Bank has been running successfully. However, it was not free from scandal. Between 2009-2013, 5000 crore taka was lost from Basic Bank, which can be considered as the biggest loan scam in Bangladesh. Loans were given to fictitious borrowers and thus the amount was not recovered. Among the borrowers; names of three institutions were found- M/S SPN Enterprise, A>B Trade Link and B Alam Shipping. These three institutions had withdrawn a huge amount of money from the bank by showing fictitious information regarding the own companies as well as the address of the

residence. Still, Basic Bank is suffering and cannot be able to make a profit. Till December 2018, NPL of Basic Bank stood at 9,114 crore taka.

BB has exposed a rule regarding loan limit to a single borrower, which is more than 50lakh shouldn't be given to a single client. But, Janata Bank used to break this rule most of the time. Between 2017-2018, 920crore taka was lost from Janata Bank. It is found that 87 exporters withdrew the huge amount of money within these two years. However, as the loans were not recovered, those became default loans. At the end of 2018, the default loan of Janata Bank reached 17,224 crore taka, which is found to be the highest among the NPL amount of all of the banks.

Before 2013, Rupali Bank lent taka 45.077 billion to only 20 clients, which was out of rules provided by the BB. Within 2013, only 1.04 billion takas had been collected and the rest of the amount remains in default. In 2016, the total default loan of Rupali Bank was taka 34. 84 billion. But within one year, this bank recovered a huge amount. Up to September 2017, Rupali Bank reduced non-performing loans by 260 crores. Since 3years, this bank has been trying to be technologically strong, enlarging the area by opening more branches countrywide, expanding new products and attracting investors. That's the reason why Rupali Bank is making a profit, while other government-owned banks are still behind.

According to the real perspective, non-performing loans have become the most fearsome issue because of these state-owned banks' management, as the level of the bad loans is very low in private banks. If these banks would have maintained proper bank rules and have strict management policies, maybe the whole bad loan issue will not arise. Because of the increased amount of default loans, capital shortage arises in the banks, which badly affects the financial performance of the banks. According to the previous descriptions of default loans of these state-owned banks, it is certain that some men looking animals outwitted the banks by not repaying the loan amount. Besides, they found the scope of cheating because of the weak management of banks. Most ridiculous fact is, after the scam of Sonali Bank, when the auditors and senior executives were asked by the investigators how such kind of crime happened in this renowned bank, then they replied that they were not informed about the matter; even they didn't know that such kind

of huge loan was provided to the Hallmark group. Thus the fact is quite clear how was the internal management of this bank. That's the reason why these state-owned banks lost huge customers and the private banks have achieved the belief of general people and have a very slight amount of non-performing loans compared to those banks. As the whole of Bangladesh is mostly dependent on banks for financial success, it is crucial for the state-owned banks to modify their internal management. However, because of having political power, a large group of people denies to pay the loans and thus default loans are created. Therefore, the government can play an important role to remove such kind of illegal works by exposing strict rules. For a few years, the Anti- Corruption Commission has been working to investigate such kind of illegal works and to punish the culprits.

This paper is organized as follows- Section2 exposes the review and summary of the previous studies regarding the concept of non-performing loans and its determinants, along with the industry analysis. Summarized findings of more than 30 studies have been mentioned there to introduce what other studies have already found regarding non-performing loans. Section 3 deals with the methodology of the research, which contains detailed information on the tests used in the study- Unit root test (ADF, PP, and KPSS), ARDL, ARDL Bound test, and all the variables as well. In Section4, the findings of the research have been expressed in a descriptive manner to clarify individually how the independent variables are effecting the dependent variable (NPL) and how strong the relationships are between all variables in both the long run and short run. Finally in Section5, the concluding statements are discussed.

1.2 Statement of the Problem

The purpose of the study is to find out how macro fundamental factors (Broad Money, Domestic credit by the financial sector, Domestic credit to the private sector, financial volatility, Remittance, Trade Openness) affect the non-performing loans of financial sectors in Bangladesh.

1.3 Objectives of the Study

The objective of the research is to determine which factor is more responsible for the non-performing loan from the perspective of macro fundamental factors based on the evidence of the financial sector of Bangladesh.

1.4 Theoretical Framework and Research Hypotheses

This study is not aimed to be a comprehensive study including all the determinants of bank-specific and macro fundamental, rather it is developed to show how only macro fundamental factors affect the non-performing loan in Bangladesh. The relationships between non-performing loans and 6 macro fundamental variables are established with the support of the Auto-Regressive Distributed Lag Model. Six hypotheses have been conducted in this study-

$H_{1A,\ B}$: Broad Money affects the Non-Performing Loans positively and vice versa.

$H_{2A,\ B}$: Domestic credit by the financial sector affects the Non-Performing Loans positively and vice versa.

$H_{3A,\ B}$: Domestic Credit to Private sector influences the Non-Performing Loans positively and vice versa.

$H_{4A,\ B}$: Financial Volatility affects Non-Performing Loans positively and vice versa.

$H_{5A,\ B}$: Remittance affects the Non-Performing Loans positively and vice versa.

$H_{6A,\ B}$: Trade Openness affects Non-Performing Loans positively and vice versa.

1.5 Definition of key terms:

- ✓ **Broad Money:** Available money in the economy for use including cash, money in bank accounts and other money available for banks to be used. Broad money is the measure of money supply in the economy.

- ✓ **Domestic credit by the financial sector (DBD):** Includes all credit to many sectors on a gross basis except the credit to the central government.
- ✓ **Domestic Credit by Private sector (DCP):** the number of financial resources provided by the financial corporations to the private sector in the form of loans, purchase of securities, trade credits, etc. and which constitutes a claim of repayment.
- ✓ **Unit root test:** Unit root test is a test to find out the stationarity in time series.
- ✓ **Augmented Dickey-Fuller Test (ADF):** Common statistical test used to test the null hypothesis that whether there is unit root exists in time series.
- ✓ **Phillips- Perron (PP):** Phillips- Perron test is a kind of unit root test which is used in the analysis of time series for the purpose of testing the null hypothesis that, a time series is integrated of order1.
- ✓ **Kwiatkowski-Phillips-Schmidt-Shin (KPSS):** KPSS test is used to test the null hypothesis that whether the required time series is stationary or non-stationary around a deterministic trend in the opposition of the alternative of a unit root.
- ✓ **Auto-Regressive Distributed Lag (ARDL)**: ARDL test is a test used to determine the cointegrating long run and short-run relationship among the variables, comparing each of the independent variables with the dependent variable.
- ✓ **Auto-Regressive Distributed Lag Bound Test:** A test that is like a proof that there is a long-run relationship among all the variables.
- ✓ **Remittance (RE)**: Amount of transferred money to a country from another country, which is sent by the people working abroad.
- ✓ **Trade Openness (TO):** Trade openness refers to the addition of imports and exports associated with GDP, which ultimately affects the economic growth of a nation. The trade to GDP ratio is often called the Trade Openness ratio, which is measured by a simple average of total trade relative to GDP.
- ✓ **Financial Volatility (FDV):** measurement of the variations in the asset price over time.
- ✓ **Gross Domestic Product (GDP):** It refers to the monetary value of products (both goods and services) within a national geographical border of a nation within a specific time period.

- ✓ **Linear ARDL Bound Testing:** It refers to the test of examining the presence of long-run relationships among the tested variables.
- ✓ **Ordinary Least Square (OLS):** It refers to one kind of linear least square method that estimates the relationship between the dependent and independent variable in a statistical method.

- ✓ **Coefficient of Determination (R^2):** It refers to the proportion of variance existed in the dependent variable that can be predicted by a particular independent variable.
- ✓ **Adjusted Coefficient of Determination (Adjusted R^2):** It refers to the proportion of variance existed in the dependent variable that can be predicted by multiple independent variables.
- ✓ **Standard Error of Regression:** It refers to how much deviation is presented between the observed values and predicted value considering the regression analysis.
- ✓ **F Squared Statistics ($F^2 statistics$):** It examines which model gives a better fit to the data- linear regression model with independent variable or model without an independent variable.
- ✓ **Autocorrelation:** It refers that when a variable is correlated with itself over many time intervals.
- ✓ **Heteroskedasticity:** It refers to the non-constant standard error of a variable and the presence of it can invalidate the significance of statistical tests.
- ✓ **Normality Test:** It refers to a test that is used to examine whether the sample data has been taken from a normally distributed population or not.
- ✓ **Regression Specification Error Test (RESET):** It refers to the test that examines the presence of non-linear relationships while analyzing a linear regression model.
- ✓ **Error Correction Term (ECT):** It refers to the speed of adjustment of the dependent variable to the equilibrium level after a short term shock of all the variables.
- ✓ **Schwarz Information Criterion (SIC):** It refers to an index that is used to choose a model from different models or lag selection.

CHAPTER II: REVIEW OF THE LITERATURE

2.1 Introduction

After the birth of Bangladesh, financial institutions involving banks and insurance companies were required to exercise social control over the country's resources. By creating capital formation, maintaining price level, banks are contributing a lot to the economies of the countries. After 1971, the Dhaka branch of State Bank of Pakistan was renamed as the Bangladesh Bank. Regulation of the currencies, controlling monetary and credit policy, controlling exchange rates, etc. are the basic functions of Bangladesh bank. Bangladesh Bank is considered to be responsible for formulating and implementing monetary and credit policies, regulating and monitoring financial intermediaries, issuing currencies, managing payment systems, and preserving all credit information.

All the financial institutions need to report to Bangladesh Bank about their functions and performance. This monitoring and regulations given by the central bank are very vital to control the unusual activities of financial institutions, so that general people don't get hurt by them. Even after taking many regulations, different Govt. owned bank has been engaged in different fraudulent activities by giving a huge amount of illegal loans to different persons and companies which ultimately increases the non-performing loans of Bangladesh. In the last decade, the trend of NPL is upward. Different reasons are behind this trend. Again, three times big crashes in the stock market make the market unreliable and inefficient to the investors. Many investors consider the stock market as the last investing option. Now if the people of a country don't have trust in the stock market, then that economy will never get a strong capital market. Thus, overall economic growth is never possible. Even, after passing so many years of independence, no Govt. was successful to establish a separate and strong bond market from where businesses can deal their debt financing smoothly.

In spite of having many weaknesses in the financial institutions, the emergence of the micro-finance industry is one revolutionary step of Bangladesh that engaged the rural people under the benefits of financial institutions which directly affect both the social life of those people and the overall economy of Bangladesh. The entry of private commercial banks under both domestic and foreign ownership, leasing companies, development

institutions, insurance companies have given an almost complete look at the financial industry of Bangladesh. Presently, the banking sector of Bangladesh includes the Bangladesh Bank as the central bank, state-owned commercial banks, specialized banks, private commercial banks, foreign commercial banks. Moreover, the financial sector of Bangladesh consisting of-

Table 1: Financial Sector of Bangladesh

1. Bangladesh Bank
2. Commercial Banks
3. Government-owned Development Financing Institutions (DFIs)
4. Government-owned Investment company
5. Finance and leasing companies
6. Insurance companies
7. Dhaka and Chittagong stock exchanges
8. Bangladesh Samabaya Bank
9. Bangladesh Rural Development Board
10. Bangladesh Post office savings bank
11. Microfinance institutions

2.2 Industry Analysis

After the birth of Bangladesh in 1971, the financial sector of Bangladesh improved a lot in terms of number, variety and asset growth of the institutions. Though the economic strength is mostly measured by the growth and performance of the banks, non-bank financial institutions also contribute largely to the development of the economy. To make the life of the people more secure and better, insurance companies are invented. Moreover, to improve the living standard, microfinance institutions have emerged in Bangladesh like the other developing countries, whose purpose is to provide loans to the unprivileged people based on mutual trust. In addition, leasing companies are now available for the general people and other business institutions to hire some necessary equipment rather than buying those.

However, Bangladesh is lagging behind compared to the other countries in terms of overall economic growth. For sustainable economic growth of the country, banks and other non-bank financial institutions should be conducted successfully; so that due to a slight change of economic condition, the performance of the institutions won't fluctuate that much. But the irony is that Bangladesh is still failed to develop a strong capital market from where the different financial institutions can easily collect their capitals and it is one of the main reasons why the growth of financial institutions cannot be considered as a significant one. Again, the increasing amount of non-performing loans and the continuous volatile stock market become the headache of Bangladesh's economy. Without taking any strong step regarding this issue may hamper the dream of Bangladesh to become a developed country within 2041. This study will develop the financial industry analysis basis on dividing the whole financial institutions into two broad categories- Banking Industry and Non-banking Financial Industry. This analysis will also present some of the main reasons which are suffering the overall growth of different industries under the financial industry.

2.2.1 Specification of Industry

Banking Industry:

The banking industry is quite larger compared to the other industries of Bangladesh, which ultimately controls the economic sector of the country. That is the reason why the number of banks and branches have been increasing dramatically. There are various categories of scheduled banks in Bangladesh-

Table 2: Categories of Schedule Banks of Bangladesh

1. State-owned Development Financial Institutions (DFIs)
2. Specialized Banks
3. Conventional Private Commercial Banks
4. Private Commercial Banks (PCBs)
5. Islami Shariah based PCBs
6. Foreign Commercial Banks (FCBs

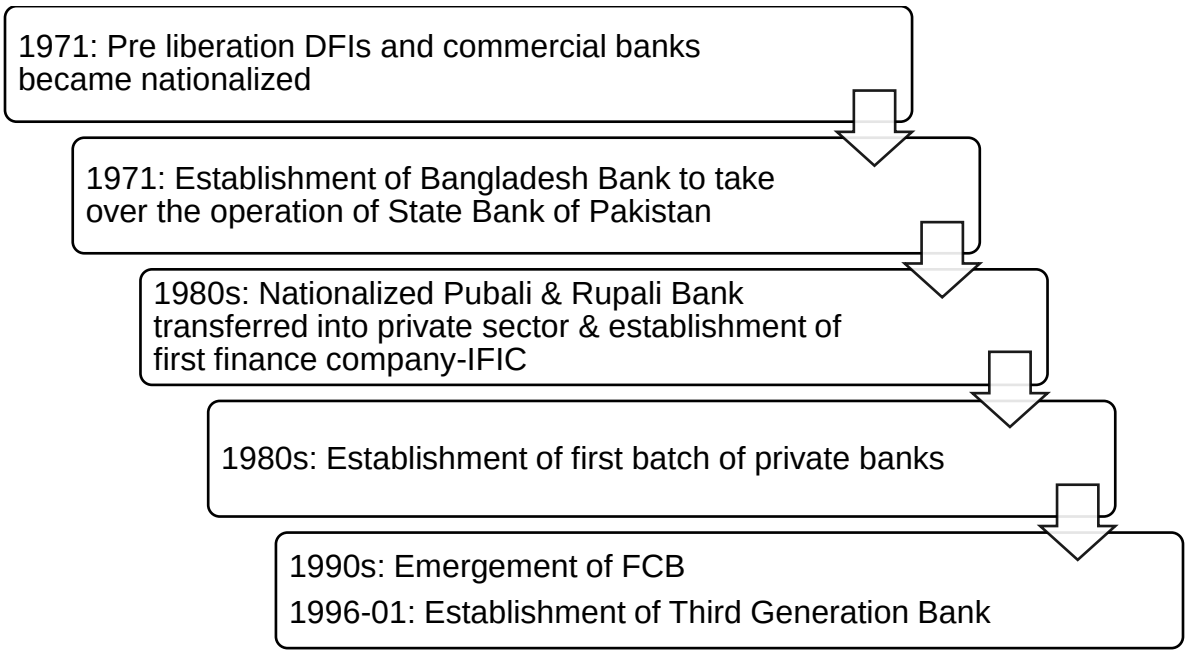
Currently, there are 59 scheduled banks in Bangladesh. Being the central bank of the country, Bangladesh Bank controls over all of the banks' management. However, the performance of banks uses to fluctuate often. Though most of the banks' liquidity management is better, inactivity in asset management is found (Moudud-Ul-Huq 2017). The volume of deposit was only 9.132 billion in June 1974, whereas it was almost 9874.89 billion in June 2018.

The process of growth and diversity came into light when Private Owned Commercial Banks (PCB) came into the scene in the early 1980s. With the hope of capturing the emerging market of Bangladesh, many Foreign-Owned Private Companies (FCB) commenced their business in Bangladesh in the 1990s which ultimately changed the overall banking industry scenario of Bangladesh. Once SCB enjoyed almost 95% of the total bank deposit, but in 2018; it fell down into only 27.35%. On the other hand, PCB

is now holding almost 66% bank deposit share. As banks under SCB could not upgrade themselves with the upgraded technologies and ongoing aggressive market strategy, SCB is gradually going out of the competition.

Since the banking industry is considered as the main element of the overall financial system of Bangladesh, so having a sound banking system is important for the continuous development of the economy. The main source of funds for the banks is the deposits taken from households and other private sectors. In 2017, of the total fund, 75.3% came from deposits. The other two sources of funds are capital & reserve (7% of overall deposits) and other liabilities (17.7% of total funds). On the other hand, it is obvious that loans and advances are considered as the main asset which was almost 61.6% of the total assets for the banks. Govt. bills; bonds, deposit with Bangladesh bank, Cash in hand and other assets cover the remaining 38.4% of the total assets. The performance of both domestic and foreign-owned commercial banks is the main reason why the banking industry is still contributing to GDP. The overall growth of the banking industry is given below,

Figure 1: Overall Growth of Banking Industry



According to the reports of Bangladesh Bank, total banks number and their performance data are given below along with a graph on NPLs of banks to clarify the actual view of banks in Bangladesh.

Table 3: Banking Industry Performance Indicators

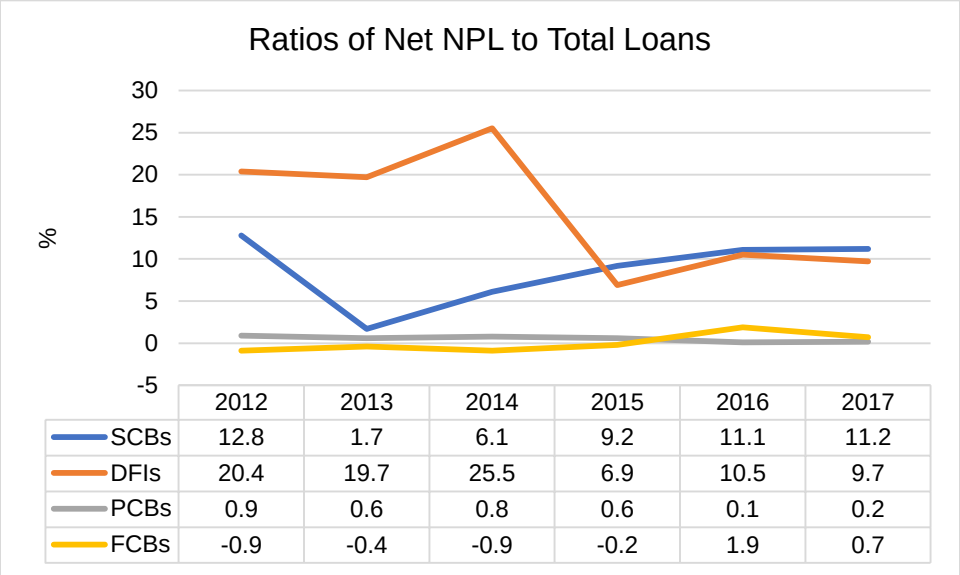
Bank Types	2017				2016				2015			
	Bank Number	Branches	Net NPL/ TL	ROE	Bank Number	Branches	Net NPL/ TL	ROE	Bank Number	Branches	Net NPL/ TL	ROE
SCB	6	3721	11.2	3.45	6	3710	11.2	3.45	6	3690	9.2	-1.5
DFI	2	1407	9.7	-3.07	2	1407	9.7	-3.07	2	1406	6.9	-5.8
PCB	40	4758	0.2	12.01	40	4467	0.2	12.01	39	4226	0.6	10.8
FCB	9	69	0.7	11.31	9	70	0.7	11.31	9	75	-0.2	14.6
Total	57	9955	2.2	10.60	57	9654	2.2	10.60	56	9397	2.3	10.5
	2014				2013				2012			
SCB	5	3553	6.1	-13.6	4	3520	6.1	-13.6	4	3478	12.8	-11.9
DFI	3	1500	25.5	-6.0	4	1494	25.5	-6.0	4	1440	20.4	-1.1
PCB	39	3917	0.8	10.3	39	3602	0.8	10.3	30	3339	0.9	10.2
FCB	9	70	-0.9	17.7	9	69	-0.9	17.7	9	65	-0.9	17.3
Total	56	9040	2.7	8.1	56	8685	2.7	8.1	56	8322	4.4	8.2

Note 1: SCB for State-Owned Commercial Banks, DFI for Development Financial Institutions, PCB for Private Commercial Banks, FCB for Foreign Commercial Banks, TL for Total liabilities, ROE for Return on Equity, NPL for Non-Performing Loan; **Note 2:** All the data have been taken from Bangladesh Bank website.

Table 4: Amount of Bank Facing Capital Deficit

Banks Facing Capital Deficit (Up to June 2018)			
Name of Bank	Amount of Deficit (Billion)	Name of Bank	Amount of Deficit (Billion)
Sonali Bank	66.013	Bangladesh Agricultural Bank	80.096
Basic Bank	31.062	Rajshahi Krishi Unnayan Bank	6.459
Janata Bank	21.953	ICB Islami Bank	15.250
Agrani Bank	14.193	Bangladesh Commerce Bank	3.019
Rupali bank	12.932	Social Islami Bank Limited	0.455
Source: Mawla (2018) Note: All the monetary value are is BDT			

Figure 2: Ratios of Net NPL to Total Loans



	2012	2013	2014	2015	2016	2017
SCBs	12.8	1.7	6.1	9.2	11.1	11.2
DFIs	20.4	19.7	25.5	6.9	10.5	9.7
PCBs	0.9	0.6	0.8	0.6	0.1	0.2
FCBs	-0.9	-0.4	-0.9	-0.2	1.9	0.7

Banks survive through receiving deposits and providing loans. So, when non-performing loans arise, it becomes a great burden for banks. In this graph, the percentage of non-performing loans out of the total loans within the years of 2012-2017 of various kinds of banks has shown, which ensures the poor performance of the banks. State-owned commercial banks are owned by the government fully or partly (maximum). In addition, development financial institutions are those institutions that stand for providing risk capital for various projects and these institutions are fully owned by the government. In general, it is always expected that government-owned institutions will run more successfully than the private-owned (like the other developed countries).

In the developed countries, the institutions which are owned by the government, are found to be always stronger than the privately-owned institutions in terms of profitability, assets, and regulations as well. But, the scenario (graph) says something opposite. The performance of the state-owned banks and development financial institutions are really in such condition to be criticized. Having such a large percentage of NPLs, it is next to impossible for banks to run successfully. Even the seven SCBs are facing capital deficit by a huge amount by June 2018. According to the June 2018 report of Central Bank, they used their core capital because of the high amount of non-performing loans. Looking into the PCB and FCB, as the percentage of NPL is low, so the

concluding fact is that still, the whole banking sector of Bangladesh is alive because of the privately owned banks. However, these percentages use to fluctuate over the years and non-performing loans are becoming a barrier for the economic growth of Bangladesh.

While further analyzing the reasons behind the poor performance of SCBs, Firstly; regulatory authorities are weak in controlling those banks and sometimes their decisions are also questionable. In the last few years, Govt. is providing capital to these institutions from the national budget and still, these institutions are not able to solve their problems. Based on the report of the Center for Policy Dialogue (CPD), almost 11.705 billion BDT had been provided to these institutions during the period from the fiscal year 2009-10 to 2016-17 (CPD 2018). Second, political influence is one of the main reasons behind it. Many big elephants are doing many fraudulent activities with the help of top executives that directly affects the performance of SCBs. Third, these SCBs are not enough concerned about upgrading themselves with modern technologies and marketing strategies like PCBs and FCBs. Four, inefficient and unstructured capital markets resist them to collect sufficient capital for better performance. Even after the 48 years of independence, no separate bond market has been established. These four reasons can be considered as vital reasons.

In the last two years, the central bank has taken many steps in order to make the SCBs more profitable and bring the commercial banks under different regulations. Adopting the aggregate micro-prudential soundness indicators consisting with earnings, liquidity, capital adequacy, asset management, and sensitivity to market risk is one of the vital steps under which all the banks need to maintain these ratios within a given fixed range for each accounting period and which will be directly supervised by the central bank authority. Other than this, individual bank assessment; monitoring and regulating the large borrowers whether they are maintaining the timely repayment or not; advising in order to strengthen the internal management control; monitoring stock investment; establishing risk management committee with new risk management guidelines and so on. For reducing the non-performing loans, Bangladesh Bank has adopted different measures such as loan classifications, write-off, loan rescheduling, and provisioning and also ordered to implement a new loan recovery mechanism for each of the banks.

Non-Bank Financial Institutions:

Non-bank financial institutions are those kinds of institutions, which are controlled and regulated by the Financial Institutions Act of 1993. For the economic development of Bangladesh, not only banks but also non-bank financial institutions contribute a lot by providing long term loans for agriculture or housing, leasing of equipment, insurance facilities, investment in shares, financing venture capital and utilize its capital to invest in companies. Currently, 34 NBFIs are operating in Bangladesh. Of them, 3 are Govt. owned, 12 are running as a joint venture with foreign companies, and the remaining 19 are domestic privately owned. The volume of investment was only 9.197 billion in June 1998, whereas it was almost 85.04 billion in June 2018. The categories of NBFIs are as follows-

a) Microfinance Institutions
b) Leasing companies
c) Insurance companies
d) Investment companies
e) House Finance companies
f) Modaraba companies
g) Venture capital companies
h) Corporate Development companies, etc.

NBFI started contributing to the economy largely in the early eighties when the Industrial Promotion and Development Company of Bangladesh (IPDC) and Industrial Leasing Company of Bangladesh (IDLC) were established as a joint venture company. Gradually, different types of NBFI such as Leasing Company, Insurance Company, merchant Bank, Investment Bank, and Micro-Finance Institutions came into light in Bangladesh and together, they changed the overall economy of Bangladesh. A recent

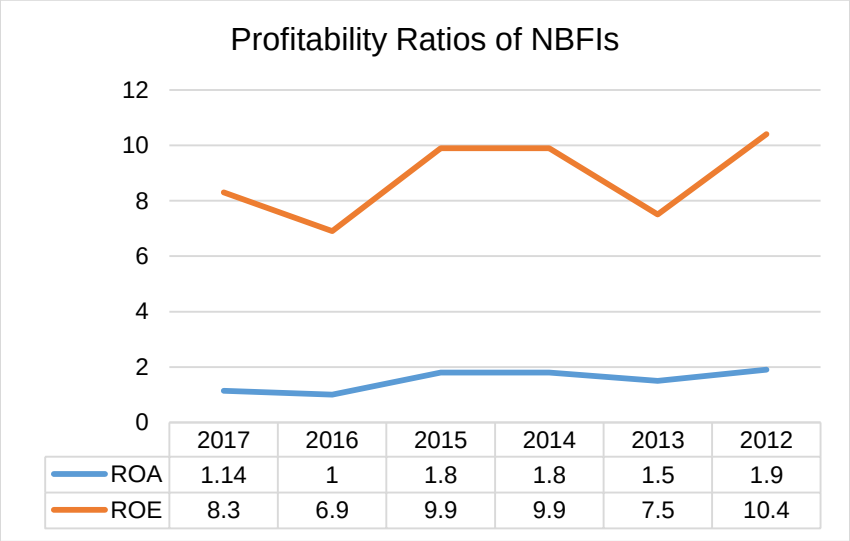
situation of the non-banking industry is given below in different table and figures from the year 2012 to 2017,

Table 5: NBFIs Performance Indicators

Particulars	Years					
	2017	2016	2015	2014	2013	2012
No. of NBFIs	34	33	32	31	31	31
TA	841	713	611	520	436	334
TL	725	606	509	424	350	274
L-A Ratio	86.36	84.95	83.3	81.5	80.3	82.2
TD	468	382	318	239	198	145
D as % of TL	64.41	63.1	62.5	56.2	56.6	53.0

Note 1: NBFIs for Non-Banking Financial Institutions, TA for Total assets, TL for Total Liabilities, L-A Ratio for Liability to Asset Ratio, TD for Total Deposits. D as % of TL for Deposits as percentage of Total Liabilities; **Note 2:** All monetary values are in BDT

Figure 3: Profitability Ratios of NBFIs



This above figure 3 exposes a better present situation of non-bank financial institutions in terms of profitability. There is a consistency among the percentages over the 6years. However, the noticeable fact is that both ROA and ROE have been decreasing at a slight percentage and the accumulation of these little amounts may result in a huge difference between the performance of NBFIs before and after 10years. Even in the graph, the visible fact is that ROE was 2.1% more in 2012 than in 2017. Thus, this fact might be an alarm for the NBFIs to focus on profitability more in order to survive successfully.

In spite of having a dependency on the banking sector, the contributions of the NBFIs to economic growth is unavoidable. The financial sector of a nation cannot be able to run without the existence of non-bank financial institutions. But, in such a developing country (Bangladesh), most of the time these institutions face ignorance from the general people, rather the banking industry is considered as the prime concern of the people.

There are some factors which can be considered as responsible for the slow growth of the industry- First of all, the government has imposed regulations to the leasing companies related to imports, and thus it has become difficult for the companies to expand. Secondly, nowadays, general people, as well as firms, are not found to feel the interest to go for insurance or to take a lease, rather they try to secure their assets with the support of technologies. Thirdly and most importantly, our capital market is not developed enough. When the capital market is inefficient and unstructured, the scope of raising capital becomes difficult. To become developed from the developing one, consciousness is required for all of the residents along with the government. It's not logical to focus on just the banks, keeping the NBFIs in the side of negligence. The growth of NBFIs broadens the product range available for individuals and institutions(Gupta, Afsana Yesmin, et al. 2013).

Micro Finance Institutions:

Being a developing country, since the 1980s, Bangladesh has been searching for the invention of new things to provide the general people a better, comfortable and secure life. But, it was a matter of regret that, the development was only confined to the urban areas of Bangladesh (before 1983), thus the rural people were left to receive loan facilities and other supports. As rural people cannot give any security against any loan or they don't have any fixed secured income, so traditional institutions were unwilling to lend money to them. So a huge amount of people were not able to bring economic success in their lives and ultimately success in the overall economy of Bangladesh. However, the situation started to change when different Non-Government Organizations (NGOs) came into light and following to them when different MFIs were established. Currently, 705 MFIs are operating in Bangladesh.

The origin of micro-credit financing dates back in 1974 when few concerned individuals set up different NGOs for the purpose of rehabilitation of a war-ravaged and flood-affected country. The primary purpose was to help those affected people. Thinking about the unprivileged people, Dr. Mohammad Yunus availed the micro-credit facilities to the general people based on mutual trust by establishing Grameen Bank in 1983. The term microfinance means providing financial services including credit, savings, insurance, and remittances to the individuals to meet household demands.

Over the last few decades, Bangladesh has made noteworthy progress in the socio-economic and economic segment, in which the contribution of microfinance is significant. Professor Muhammad Yunus initiated microfinance, which can be considered as a crucial development instrument to mitigate poverty, women empowerment and ameliorate entrepreneurship in this developing world. GB introduced a banking practice where people would get loans without any collateral and so, rural people get the opportunity to take part in the banking system. Even GB's main focus was on how to empower women. Because Bangladeshi women have different capabilities especially in handicrafts activities. If they get some financial supports, they can become businesswomen and turn their luck and that was the target of GB and they successfully

did that in the last few years. Professor Yunus won the Nobel Peace Prize with his Grameen Bank in 2006, because of the substantive outcome of implementing microfinance on the reduction of poverty and socio-economic development.

Gradually along with GB, different MFIs came out with different types of projects like giving the loan to beggars, funds given to meritorious and needy students, food against education and so many. One of the biggest contributions of these MFIs is climate change. Different MFIs came out with different innovative ideas in order to cope with climate change like saline tolerant crop farming, awareness building programs, and training, etc. In just simple words, MFIs reduce poverty from Bangladesh, engaged unemployed rural people into employment, and engaged them in contributing to the overall economy of Bangladesh. In spite of huge success, MFIs are facing a few challenges. Different fraud institutions are taking the popularity of MFIs as the weapon in order to do different fraudulent activities with the poor illiterate rural people. In the name of loans, they are taking their livestock and other assets. If the local authority can handle these situations, then people can be protected from fraudulent activities and people will trust more on MFIs.

In Bangladesh, there are various institutions which are engaged in microfinance activities-

Table 6: Types of Institutions Engaged in Microcredit

a) Grameen Bank (A member-owned specialized institutions)
b) Around 1500 Non-Government Organizations (BRAC, Proshika, ASA, BURO- Tangail, BEES, CODEC, SUS, TMSS, Action- Aid, etc.
c) State-owned commercial banks
d) Private commercial and Specialized Banks
e) Credit unions
f) Financial cooperatives
g) Specialized credit programs by various Ministry of Bangladesh.

Though thousands of institutions are now operating micro-credit programs, only 10 large microfinance institutions and Grameen Bank holds 87% and 81% savings and outstanding loans of the industry respectively. By June 2018, GB had almost 8.31 million loan takers. Besides, Grameen Bank follows a management model, which is supportive to minimize the risk of microfinance programs. In addition, because of the contribution of the staff and management of Grameen Bank, a positive impact is noticed in controlling the disbursement of the loan, which will ultimately reduce the default payment.

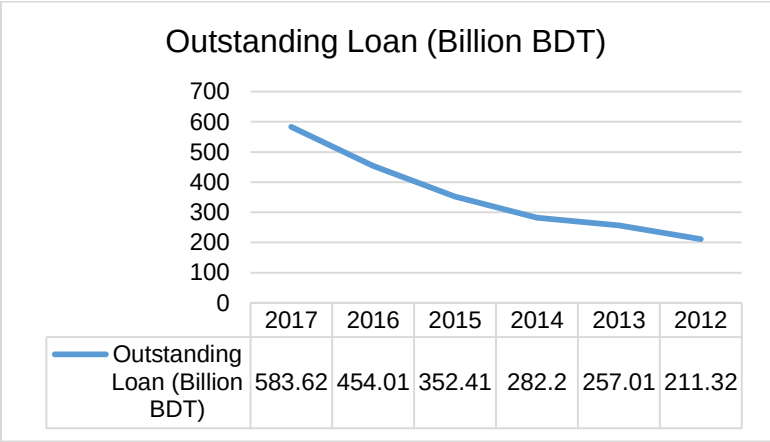
Following tables and charts will highlight the growth of MFIs in Bangladesh,

Table 7: MFIs Performance Indicators

Particulars	Year(Ends on June 30)					
	2017	2016	2015	2014	2013	2012
No. of MFI	699	680	697	697	649	590
Members (Million)	29.90	27.58	26	25.11	24.60	24.64
Loan Takers (Million)	25.98	23.11	20.35	19.42	19.27	19.31
Member Saving (Billion BDT)	216.71	170.67	135.41	106.99	93.99	75.25
Source: (MRA 2012-2018)						

Note 1: MFI for Micro Finance Institutions; **Note 2:** All the data have been taken on the last of the fiscal year which is June 30; **Note 3:** All monetary values are in BDT

Figure 4: Outstanding Loan of MFI

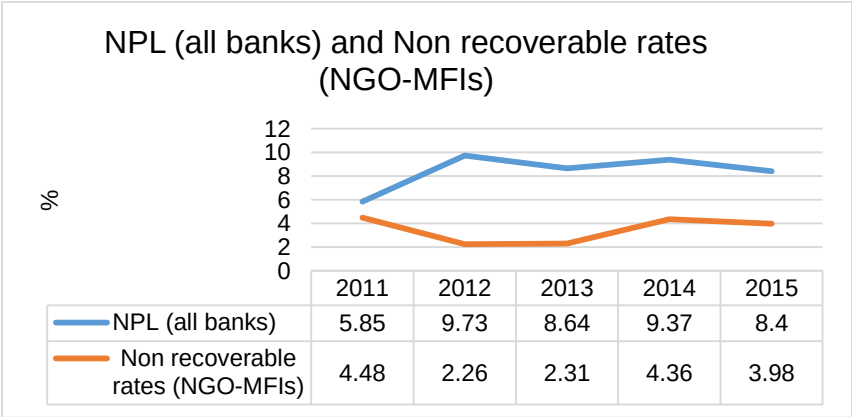


	2017	2016	2015	2014	2013	2012
Outstanding Loan (Billion BDT)	583.62	454.01	352.41	282.2	257.01	211.32

From the above table and chart, it can be clearly stated that the growth of the micro-finance industry is upwards. The total amount of loan outstanding was only 114.75 billion BDT in 2005, whereas it was almost 583.62 billion BDT in 2017. It clearly indicates more people are taking microcredit from these institutions and the rate of recovery is also giving the evidence of successful operations of MFIs. These MFIs are playing a vital role in the overall economy of Bangladesh.

However, while measuring the amount of non-performing loans in the microfinance industry in Bangladesh, the true fact is that the percentage is quite tiny compared to the banking industry. As NPLs estimations are unavailable for the microfinance industry in Bangladesh, the non-recoverable rate is used for comparison, in spite of having a similar meaning. These two terms are perilous for the financial stability of the particular industry.

Figure 5: NPL and Non-Recoverable Rates of MFIs



	2011	2012	2013	2014	2015
NPL (all banks)	5.85	9.73	8.64	9.37	8.4
Non recoverable rates (NGO-MFIs)	4.48	2.26	2.31	4.36	3.98

Source: (mia 2018)

According to figure 5, the visible fact is that non-recoverable rates of the MFIs are quite lower than the banks. That's the reason why the banks' situation comes on the top when the matter of non-performing loan arises. However, the non-recoverable rates over the mentioned 5 years are inconsistent, which gives the uncertainty of future percentages.

Insurance Companies:

As the future is always uncertain and risks remain in the protection of life and other equipment, the reduction of risk has become a crucial need for people. In another way, it can be stated that for economic development, higher return from all types of financial institutions is highly desirable. However, if there is a chance of a return, there must have the presence of risk and if the risk cannot be controlled at a minimum level, it can hamper the overall growth and insurance is such a tool that helps the institutions or households to control these risks. On a bigger scale, it can also reduce the financial burden of Govt. in many ways. In simple terms, insurance covers some level of losses arriving from different types of investments and financing. That is the reason why insurance companies are always active to reduce risk by receiving premiums (Siddikee, Siddiqua, et al. 2018).

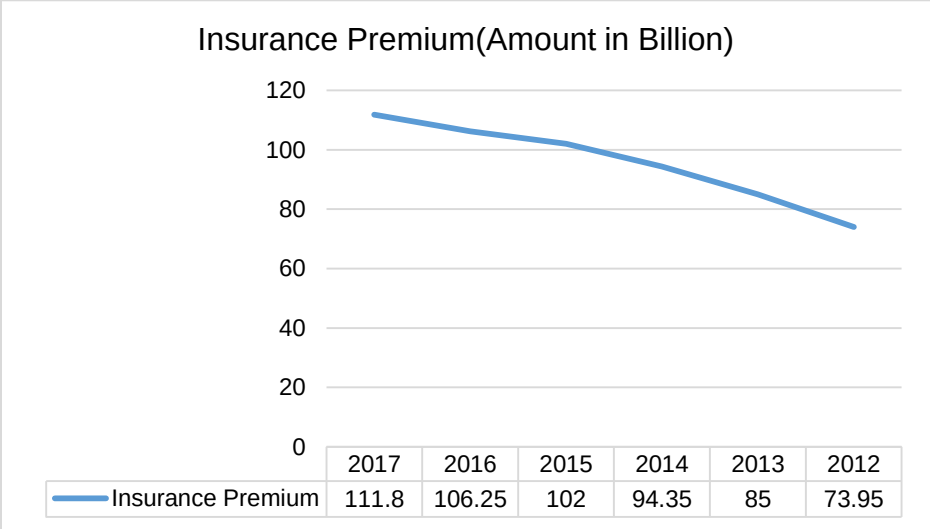
After 1971, Bangladesh expanded with 2 nationalized insurance companies- 1 life and 1 general and 1 foreign insurance company. The expansion of insurance companies started after the 1980s and thus the insurance industry became larger. Nowadays, 62 companies are functioning in Bangladesh. Of them, 18 belong to Life Insurance Company and the rest of 44 belong to General Insurance Company.

After the independence of Bangladesh, all the pre-liberation insurance companies were merged into 5 nationalized insurance company in 1972 and among them, Jatiya Bima Corporation was the controller of other. In 1973, these 5 corporations were abolished and instead of that, 2 corporations have come in light such as Sadharan Bima Corporation and Jiban Bima Corporation. However, after 1984, private insurance companies got the license to do business and at that time, 60 privately owned insurance companies started functioning (Chaudhuri 2013). Till now, Sadharon Bima Corporation is the sole insurance company which is owned by Govt. of Bangladesh. Other than this, no

other private insurance companies are allowed to insure any public property. Insurance Development and Regulatory authority of Bangladesh is the controller of all the insurance companies.

Although insurance companies were started with the hope of capturing the insurance coverage opportunities in many sectors of Bangladesh, still the insurance market is fragmented. For different reasons, the concept of insurance doesn't get popularity especially in the context of an individual. Insurance companies are run by giving services to different businesses, especially which are engaged in export-import. In spite of having several problems, total insurance premiums have been increasing for the last few years which is shown in the following table.

Figure 6: Amount of Insurance Premium



(PWC 2019)

Based on the insurance premium earnings, it can be stated that insurance companies are showing growth in the last few years. However, this is not the actual scenario of the insurance company, because the penetration rate or contribution in GDP is only 0.55% from the insurance industry in 2017 which indicates the very poor situation of this industry. In 2009, penetration was 1.20% which indicates that insurance overall performance of insurance companies is not up to the mark. Compared to other South Asian countries, Bangladesh is holding the lowest penetration rate.

The financial performance of the insurance companies is effected most by corporate governance(Datta 2018). Syed Hammadul Karim, general manager of MetLife Bangladesh said that *"Because of the lack of awareness and understanding about life insurance, still insurance is not a priority financial management tool."*

While analyzing, several problems have been identified behind this. First, the people of Bangladesh have a very low level of trust in insurance companies because of the gap between promise and delivery given by the insurance companies. Second, technological incapacities are also keeping them behind. Similar to other global insurance companies, digitalization is totally absent from insurance companies in Bangladesh. Customers of the banking industry can take many advantages from ATM services like withdrawing money and also depositing money. However, policyholders have no such opportunity to use ATM to pay premiums without any hassles. Third, insurance agents are not enough trained and efficient to attract more customers. Sometimes, they are also engaged in fraudulent activities. Without giving money receipts, they take the insurance premium from policyholders, especially those who have less knowledge about it. This kind of activity directly violating the trust between policyholders and insurers. Forth, people are not much aware of the benefits of insurance for the lack of marketing strategies taken by insurance companies. Fifth, a claim settlement system is very long and time consuming for the policyholders. Even after verification and investigations, some policyholders don't get their rights. By removing these problems, insurance companies can be another strong pillar of Bangladesh's economy as they will be able to give more loans to different institutions from their increased amount of premiums.

From the outer part, it seems that the contribution of insurance companies may not be too much just like other financial industries of Bangladesh. This argument can be eliminated by taking the example of the agricultural industry. Every year, Bangladesh faces different natural calamities and agricultural sectors are affected the highest. If the agricultural sectors can be brought under the umbrella of insurance coverage on a larger scale, then the contribution from the agricultural sector will be higher in the overall GDP of Bangladesh. Even, it will reduce the expense of Govt. In 2007, because of the damages caused by Cyclone Sidr, Bangladesh Govt. had to spend a lot for recovering the damages

of agricultural sectors. Thus, taking the right steps by both Govt. and insurance regulatory authority can make the insurance sector stronger.

Leasing Companies:

There is no ceiling to the needs of people. With the fulfillment of one need, another need replaces. However, the general people of the developing countries like Bangladesh are often found as unable to buy all the desired things because of the financial limitations. That's the primary reason for establishing the leasing companies with the purpose of providing necessary instruments to the people with a periodic payment instead of selling. Leasing companies are one kind of non-bank financial institution, which is licensed by Bangladesh Bank under the Financial Institutions Act, 1993. Leasing refers to an agreement between two individuals, in which the owner of an asset or property provides an offer to a firm or a person the use of service of the asset for a particular period, for an agreed amount of money. That means lease enables a business to use the service of an asset without buying it.

Starting in 1986, leasing companies are running successfully in Bangladesh with tremendous growth. Leasing got popularity as an alternative form of financing in 1995, when there was just one leasing company (Islam, Islam, et al. 2014), but gradually the number reached 22 in 2012, and it is found to be 24 in 2019. Among all the leasing companies in Bangladesh, Industrial Development Leasing Company (IDLC), United Leasing, Phoenix Leasing Co. Ltd are the most common. For strengthening the financial market, lease financing is found to contribute a significant percentage(Faisal and Elahi 2016). Leasing has become attractive to the people because of its several facilities- the scope of using expensive equipment without buying it, receiving tax exemptions and advantages of the periodic payment.

However, like the other financial companies, leasing companies face complexion to increase funds by short or long term borrowing from capital markets. Though the lease financing sector developed a lot, still it is found that in recent years (after 2012), the growth rate is low comparatively. First, more than 60% funding of lease companies come from

commercial banks and the recent vulnerable conditions of banks make it difficult for the leasing companies to collect fund. The rest of the funds come from fixed deposits. The increase of non-performing loans also makes it difficult for the banks to issue funds to the leasing companies. Even some of the leasing companies are fully dependent on banks. Second, depositing systems like leasing companies cannot take deposits for less than three months; transactions through banks, no issuing of checkbooks make it difficult for them to fight against the liquidity crisis. Because these systems are the main reasons why general people are not interested to keep deposits in leasing companies. Third, inefficient and unstructured capital markets don't allow to raise capital easily.

The situation is so bad that one of the oldest leasing companies named People's Leasing and Financial Services (PLFS) has gone under liquidation very recently. Even the people are interested to withdraw their deposits from leasing companies, but they are not able to give the depositors' money back because of a liquidity crisis. Without proper steps taken by Bangladesh bank and government, an emerging industry can face overall liquidation.

Concernment of Establishing Derivative Market

Though derivative is a new concept for us, the invention of derivatives markets occurred officially before the 1900s'. Even India, our neighboring country started the trade of derivatives before 20years from now in 2000. However, still, the derivative contracts and its functions are confined to the study materials of Bangladesh. Derivatives impose a strong and significant impact on modern finance because of providing crucial advantages- firstly, by deriving the value of an underlying asset, derivatives contract reduces risk. Besides, both of the parties in the contract shouldn't have to bear any loss. Secondly, asset price estimations can be made easily through the derivatives. For instance, the approximate commodity price can be forecasted through the spot prices of the futures. Thirdly, the efficiency of financial markets strengthened by derivative contracts. Often underlying asset prices and derivatives remain in the equilibrium, which reduces the arbitrage opportunities. Finally, by conducting interest rate swaps, a business

group may gain favorable interest rates compared to the rates in the market which is available for all.

Among all the financial institutions, the banking industry is moving forward and the development in the banking sector strengthens the financial performance of the financial industry and the economy as well. NPL hurts the banks' performance. So the economy also suffers, which shouldn't be continued. The capital market of Bangladesh should be developed to become an alternative sector of banks. Stock price fluctuations often hurt investors, which should be modified. Hopefully, a strong and efficient economy can be built with the establishment of the derivative market.

2.2.2 External factors

Finance is considered as the blood of trade and financial institutions, without which a single person cannot survive. Especially banks utilize the finance sector and make the flow of the resources. As the growth of the economy of Bangladesh largely depends on banks, so the development of the banks is obvious for the socio-economic developments of the country. To run successfully, the profitability of the banks is needed. There are some external factors that influence the performance of banks.

a) **The sensitivity of the industry to economic fluctuations:** The banking industry stands on the monitory function of a country. This industry is closely connected to economic activity. Thus because of the economic fluctuations, such as- GDP growth rate, inflation rate, money supply, interest rate, exchange rate, etc.; this industry responds sensitively. According to previous studies, Bangladesh has a less volatile economic environment. From 1980-2014, the GDP growth was consistent with the percentage of 0.54 and 0.30, which indicates a stable economic environment. However, higher GDP not always support the strong economy. The external economic factors (excluded from the research) are described below:

   i. **Consumer Price Index (CPI):** CPI is the measure of inflation, which indicates the upward movement of price. When the price of the goods rises, people will prefer to buy less and also have fewer savings on banks, and so, they will be able to save less in different banks and ultimately, banks will not be able to provide sufficient loans to different institutions. If providing loan which is considered as the main function of banks is affected because of increased CPI, then it will negatively affect the profitability of the banking industry.

   ii. **Gross Domestic Products (GDP):** GDP is considered a strong economic indicator, which is the reflection of the economic performance of a nation. Higher GDP growth reveals the strength of the economy and indicates that the nation is moving forward. As a positive relation exists between GDP and private savings, it will create a significant positive impact on the banks'

capital. Different investors become motivated in more investment in such an excellent economy and for that, they take larger loans from the banks which ultimately positively affects the profitability. A high level of GDP attracts many companies to start a new business to grab the opportunity from a high GDP based economy. For starting the business, they need financing and the banking industry can supply that fund which can increase their performance.

iii. **Interest rate:** The interest rate is considered as the primary determinant of banks' profitability. Interest rates are fixed by the Bangladesh Bank and the fluctuation of interest rate may hurt the banks' success. Recently the government has announced that by April 2020, the interest rate of all the commercial banks will come down at a single digit, which may affect the banks' profitability. So if the Govt. allows a higher interest rate for the banks for giving loans, it becomes profitable to them. Because banks are a major source of a fund providing to different companies and companies will be bound to take the loan with higher interest rates and which will ultimately increase the profits of banks.

iv. **Exchange rate:** The exchange rate is considered as the powerful influencer of the economic condition of a nation. The depreciation of exchange rates pushes the prices of commodities to be high. Thus, the high price of goods may lower the savings of the people, which ultimately affects the banks' capital. Moreover, the fluctuation of exchange rates lets the economy to suffer because of the lack of currency controls and difficulties in export-import.

v. **Money Supply:** If there is an increase in the money supply in the economy of Bangladesh, people will have more money in the hand and they will be able to save more in the banks after their expenditures and so, banks will have more money supply. Having more money supply in banks will force the banks to lower the interest rates to attract more lenders. So different institutions can lend more money from banks at a lower rate. Again, a decrease in the money supply will give less money in the hand of people

and so, they will be able to save less in the banks. Because of less supply of funds, different institutions will have to lend less amount at a higher interest rate. In both the situation, there is a chance of both increase and decrease in profit. It will depend on the management of the bank how they will handle the situation in a profitable way.

vi. **Remittance Inflow:** In an economy like Bangladesh, a huge amount of remittance comes into this country every year which ultimately increases the money supply in the overall economy. People will save an excessive amount of money in the bank by which banks can extend their business in a profitable way.

vii. **Trade Openness:** Increased amount of export and import always increase the profitability of the banking industry. In Bangladesh, most of the trade is still done based on the letter of credit (LC) and from that, banks earn a significant amount for opening the LC and also for making the connection between the traders. Again, for matching with an increased amount of trade with foreign companies, companies need to take large loans from banks which can increase profitability.

b) Inefficient and Unstructured capital market: While the capital market holds a huge percentage to measure the strength of the economic condition, the bitter fact is that the capital market of Bangladesh is not developed. Fluctuations in stock prices have now become a common phenomenon, which creates impacts on banks' capital. Three major crash lose the confidence of investors from stock markets. Even it happens that, the new company needed to sell the Initial Public Offerings (IPO) at less than their face value. Again, there is no separate bond market from where they can deal with debt financing. In developed countries, where derivative markets have become attractive to the people, in our country it has not established yet.

c) Consumer perception: Consumer perception creates an impact on banks' profitability. Because of the poor services of the banks owned by the government, most of the people lost their interest to trust on banks and thus they don't go for

any dealings with the government-owned banks. Though nowadays private banks gained huge success due to consumers' response and trust, a nation's development is often incomplete without the development of government-owned banks. But, because of losing trust, these banks couldn't hold expected capital, which ultimately hurts the profitability

d) **Political factors:** political factors are the most mooted issues in terms of banking transactions. Especially the government-owned banks face these problems a lot. Through political power, some people don't repay the loans and which ultimately creates the non-performing loans. Day by day, the total amount of NPL is increasing in the banking industry which negatively affects the profitability of banks. Again, the different political crisis also affects performance. Crashes among the different political parties affect the daily functions of banks.

e) **Technological factors:** In this modern age, people are fond of new instruments to make life easier. That's the reason why ATM booths have been availed by the banks to keep the customers satisfied. The concept of the debit card, credit card, and prepaid card came into the market because of the upgraded technologies. Even with the help of technologies, many rural people have been undertaken into banking services in Bangladesh. With the help of mobile banking, they can receive or send money even from the villages. These modern services have increased the overall growth of banks which ultimately positively affects profitability. Moreover, banking transactions can be done through the internet and mobile too. But, private banks are found to be technologically quite strong than the government-owned banks. Still, now, there is a lack of fast service in the banks which are owned by the government. That can be one of the most crucial reasons why people are losing interest to deal with these banks and which hits the profitability of those banks.

f) **Tax Policy:** Tax-related policies taken by Govt. directly affects the profitability of the banking industry. The increase of corporate tax decreases the profits and a decrease in corporate tax rate increases the profits of banks. Before announcing the financial budget of 2019-2020, the tax rate was 40% for the listed banks and 42.5% for the non-listed banks. In this fiscal year, Govt. has reduced 2.5%

corporate tax for all types of banks which will certainly increase the profits as banks will have to spend less tax expense.

g) **Competition:** The above-given industry analysis has highlighted that SCBs are lagging much behind the commercial private banks because they are not able to compete with the intensive competition. Private Banks are introducing new marketing strategies that cannot be adopted by SCBs. They are still maintaining their business in traditional ways. Again, PCBs are facing challenges to fight with FCBs because of a larger amount of capital investment by FCBs. However, this intense competition ultimately helps the banking industry to grow. Banks are forced to take new steps to compete with the growing banks.

2.2.3 Barriers to Entry

Banks cover a large economic dependency of Bangladesh. In recent years, the banking industry is provoked with corruption, overstaffing, lack of proper credit system, etc. In 2019, 80 applications were filed in Bangladesh bank in order to get permission for opening a new bank. Different people or organizations nowadays want to open money to maintain a smooth circulation of funds for their other businesses from that bank. Among all 80 applications, only 3 organizations got permission to open new banks. In order to save the banking industry, different requirements are set that need to be fulfilled before entering into the banking industry.

- ✓ The first vital condition is to have a minimum of 4 billion BDT as paid-up capital provided by the sponsors of the bank. Even in 2019, the three banks which got permission for the opening bank were asked to have a minimum of 5 billion BDT as paid-up capital based on the present size of the economy and interests of the depositors. Again, the maximum shareholding stake of each sponsor cannot be more than 10% of the bank's total share capital.
- ✓ From the very beginning, it must be established as a public limited company. The bank has to issue the IPO within three years of commencement.

- ✓ Any director or any person who is appointed as advisor of another bank cannot be the director of the proposed bank. The member of the Board of Directors should not be more than 13.
- ✓ Different proper documents need to be submitted like a bank draft of BDT 1 million, feasibility report, biographical reports, written agreement with shareholders, business plan, risk management techniques report, memorandum of association (MOA), articles of association (AOA), certificate of incorporation, registration certificate under Joint Stock companies, etc.
- ✓ The branching ratio for an urban and rural place should be 1:1 or any other special instructions are given by Bangladesh Bank.
- ✓ Within six months of commencing the business, banks need to arrange the statutory meeting and also provide the statutory report to the Bangladesh Bank. Otherwise, that bank will be forced to liquidation.
- ✓ Without taking permission by showing the proper documents, no bank can open a new branch in any place of Bangladesh.
- ✓ After the immediate commencement of the business, banks must maintain a minimum of 5.5% as cash reserve ratio. It may seem quite difficult for newer banks to enter into the industry after fulfillment of all the required conditions of Central bank (BB 2019).

2.3 Literature Survey

Table 8: Summary of Literature Survey

Author	Country	Variables	Methodologies	Findings
Klein (2013)	Central, Eastern and South-Eastern Europe (CESEE)	**Four Explanatory Bank-level variables**: ✓ Equity-to-assets ratio ✓ Return on equity (ROE) ✓ Loan-to-Assets ratio ✓ The Loans growth rate **Three country-specific variables:** ✓ Inflation, ✓ The change in exchange rate vis-à-vis the euro,	✓ Fixed effects model ✓ Difference GMM ✓ System GMM ✓ Panel VAR methodology	NPLs level can be assigned to both macroeconomic conditions and the bank's specific factors, while macroeconomic factors are found to be more influential. The level of NPLs increase when unemployment rises, the exchange rate depreciates and inflation is high. In addition, the paper also finds that higher quality of the banks' management leads to lower NPLs; on the other side, moral hazard incentives push the NPLs to be high.

		✓ The change in the unemployment rate **Two Global variables:** ✓ The Euro zone's GDP growth ✓ The global risk aversion		
Tanasković and Jandrić (2015)	Central and Eastern European Countries (CEEC), Southeastern Europe (SEE): Albania, Bosnia and Herzegovina, Bulgaria,	✓ GDP ✓ Inflation ✓ The ratio of Foreign currency loans to total loans ✓ Average lending rate for new loans ✓ Stock Prices	✓ Static Panel Model Approach ✓ Random Effects Approach	There is a negative relationship between GDP and NPL ratio while a positive relation lies in the Foreign currency loan ratio and the level of the exchange rate and NPLs. The findings assure that the countries in which domestic currency is not the main medium of credit placements will have more problems with the level of NPLs.

	Croatia, Hungary, Lithuania, Montenegro, FYR Macedonia, Romania, Serbia, and Slovenia	✓ NPL to Total loans (dependent variable)		
Beaton and Myrvoda (2016)	Eastern Caribbean Currency Union (ECCU)	✓ Private credit ✓ GDP Growth ✓ CPI ✓ FDI ✓ NPL (dependent variable)	Panel VAR approach	Strongly profitable banks and the banks which have lower exposure to the construction sectors and household loans, tend to have lower NPLs. In addition, GDP growth and FDI have a significant negative relationship with NPL, while private credit is positively linked to the NPL.
Abid, Ouertani et al. (2014)	Tunisia	**Macroeconomic Variables:** ✓ GDP Growth ✓ Inflation Rate	✓ Baseline Model	Macroeconomic variables and bank-specific variables have an effect on the level of NPLs. GDP has a significant negative

		✓ Real lending Rate **Bank specific variables:** ✓ ROE ✓ Solvency Ratio ✓ Inefficiency ✓ Size NPL (dependent variable)	✓ Dynamic Panel data Method	relationship with NPL, while inflation and lending rate are positively related. In addition, it is also proved that the performance measurements and inefficiency are the key indicators of rising future NPL.
Rajha (2016)	Jordan	**Bank specific Factors:** ✓ Loans to asset ratio ✓ Lagged NPLs ✓ Bank size ✓ Leverage ratio ✓ Liquidity ratio ✓ Return on Equity	Panel data regression approach	According to their findings, the lagged NPLs and the ratio of loans total asset were the most crucial factors which affect the Non-Performing Loans positively. Moreover, it is also found that economic growth and inflation rate create a negative effect on Non-Performing loans.

		✓ Return on Asset ✓ Capital adequacy **Macroeconomic Factors:** ✓ Inflation rate ✓ Lending rate ✓ Economic growth NPL (dependent variable)		
Makri, Tsagkanos et al. (2014)	European countries	**Bank specific variables:** ✓ Aggregate non-performing loans to total gross loans (NPL) ✓ Bank capital and reserves to	✓ Difference Generalized Method of the Moments (GMM difference) ✓ Econometric model ✓ Descriptive statistics	Strong correlations exist between NPL and various economic and bank-specific factors. More specifically, NPLs are influenced more positively by the rate of non-performing loans of the previous year and negatively affected by the capital ratio and ROE. Along with the bank-specific factors, macroeconomic variables-

		total assets (CAP) ✓ Loans to deposit ratio ✓ Return on assets (ROA) ✓ Return on equity (ROE) **Macroeconomic variables:** ✓ Public debt as % of GDP(DEBT) ✓ Government budget deficit or surplus as % of GDP(FISCAL) ✓ The annual percentage growth rate of GDP(GDP)		unemployment, public debt are found to be positively related, while GDP creates a negative effect on the level of NPLs.

		✓ Annual average inflation rate (INFL) ✓ % of unemployment (UNEMP)		
Hà and Diệp (2014)	Vietnam	✓ GDP growth ✓ Inflation, ✓ unemployment, ✓ lending rates as well as the exchange rate ✓ Consumer price index	✓ Conventional approach ✓ Value at risk approach ✓ Panel regression model	GDP has negative and the Lending rate has a positive relationship with non-performing loans. Besides, inflation and exchange rates are not found to be crucial determinants of NPLs.
Shingjergji (2013)	Albania	✓ GDP ✓ Inflation rate ✓ Base Interest rate	Ordinary Least Squares regression (OLS) model	After the analysis, it has been found that a positive relationship exists between GDP growth and NPLs; which is totally the opposite findings from the other research

		✓ Foreign exchange rate ✓ NPL (dependent variable)		paper. Moreover, NPLs and interest rates, exchange rates -all are positively related.
Morakinyo and Sibanda (2016)	✓ Mexico ✓ Indonesia ✓ Nigeria ✓ Turkey	✓ Official exchange rate ✓ GDP Growth rate ✓ Money supply growth rate ✓ Inflation rate ✓ Total bank credit to the domestic economy ✓ Bank liquidity ratio ✓ Bank capital adequacy ratio ✓ Return on Asset	✓ Static Panel model ✓ Dynamic panel model	Nominal exchange rate, money supply growth, lending rate, bank credit- influence NPLs positively, while a negative relationship exists between return on asset, liquidity ratio, capital adequacy ratio, and NPLs.

		✓ Return on Equity ✓ Lending rate ✓ NPL (dependent variable)		
Haniifah (2015)	Malaysia	✓ Inflation rate ✓ Exchange rate ✓ Interest rate ✓ GDP Growth ✓ NPL (dependent variable)	Multiple linear regression model	According to the regression analysis, an insignificant negative relationship exists between GDP, interest rate, exchange rate, inflation rate, and NPLs.
Mondal (2016)	Bangladesh	✓ GDP Growth rate ✓ Inflation rate ✓ Interest rate spread ✓ Unemployment rate ✓ NPL(dependent variable)	✓ Unit Root Test ✓ Pearson Correlation Matrix ✓ Granger Causality Test ✓ Regression Analysis	According to the econometric analysis, a positive relationship exists between NPLs and GDP, unemployment rate. On the other hand, the inflation rate and interest rate are negatively related to NPLs.

Rifat (2016)	Bangladesh	**Bank specific variables:** ✓ Loan Growth rate ✓ Loan to total asset ratio ✓ Relative market share of the bank ✓ Return on asset **Macroeconomic variables:** ✓ Real GDP Growth ✓ Inflation ✓ Broad money NPL (dependent variable)	✓ Summary statistics ✓ Correlation matrix ✓ Fixed effect regression analysis	GDP growth rate and inflation rate are not very significant determinants of NPLs, rather firm-specific variables are more crucial in explaining non-performing loans. However. A significant negative relationship was found between broad money and NPL.

Polodoo, Seetanah et al. (2015)	Mauritius	**Macroeconomic factors:** ✓ GDP Growth ✓ Real Exchange rate ✓ Share prices ✓ Unemployment rate ✓ The real rate of interest **Bank specific factors:** ✓ Bank risk-taking ✓ Size ✓ ROE ✓ Credit concentration ✓ Capital ratios ✓ Investment ratios **Global factors:**	✓ Fixed Effects Estimation ✓ differenced GMM ✓ System GMM ✓ Random Coefficient Estimates	Macroeconomic and global factors create a significant influence on non-performing loans. A rise in cross border loans affects the rise of NPLs most positively. In addition, global indicators are found to be insignificant for the NPLs level.

		✓ EUR unemployment ✓ EUR GDP growth rate		
De Backer, Du Caju et al. (2015)	Belgium	✓ Bank size ✓ GDP Growth ✓ Unemployment ✓ NPL ratio ✓ Interest rate	Tobit Model	Credit supply and other economic activities are affected because of the rising level of NPLs. Structural variables such as bank size credit characteristics influence NPLs most.
Ekanayake and Azeez (2015)	Sri Lanka	**Bank specific variables:** ✓ Efficiency ✓ Risk profile ✓ Bank size ✓ Loans to assets ✓ Loan growth **Macroeconomic variables:** ✓ GDP Growth ✓ Inflation	Fixed effect panel data regression	Larger banks with a high level of credit growth reduce the amount of NPLs compared to smaller banks. GDP and inflation rate are negatively related to NPLs, whereas, NPLs are positively related to the lending rate.

		✓ Unemployment rate ✓ Lending rate NPL(dependent variable)		
Ghosh (2015)	US States	**Banking Industry-specific variables:** ✓ Capitalization ✓ Credit Growth ✓ Credit quality ✓ Diversification ✓ Operating Efficiency ✓ Return on Asset ✓ Industry size **Regional Economic conditions:** ✓ State real GDP Growth ✓ Inflation	✓ System GMM Estimation ✓ Panel unit root test ✓ The fixed effect estimation model	Poor credit quality, banking industry size, liquidity risks enlarge the amount of NPLs. On the other hand, strongly profitable banks lower the NPLs amount. Besides, a higher GDP rate, income growth rate reduces NPLs, while inflation, public debt increase NPLs most.

		✓ Unemployment rate ✓ State real personal income growth ✓ Housing price Index ✓ State Homeownership rate ✓ State Housing starts **National Economic conditions:** ✓ Real interest rates ✓ Deficit -to- GDP ✓ Debt -to -GDP NPL(dependent variable)		

Amuakwa–Mensah and Boakye–Adjei (2015)	Ghana	**Bank Specific variables:** ✓ Previous year's NPLs ✓ Bank size ✓ Net Interest Margin ✓ Current year's loan growth **Macroeconomic variables:** ✓ Previous year's inflation ✓ Real GDP per capita growth ✓ Real effective Exchange rate NPL(dependent variable)	✓ Panel Regression Model ✓ Hausman test	Large banks' NPLs are affected by bank-specific and macroeconomic variables, while NPLs of small banks are not affected that much by macroeconomic factors. So, when providing loans, small banks should focus more on bank-specific variables and large banks should focus on both macro and bank-specific variables in order to restrain the level of NPLs.
Jiang, Kanas et al. (2018)	United States	✓ Real Estate Loans	Markov switching framework	Prompt Corrective Action (PCA) and the Troubled Asset Relief

		✓ Non-Performing Loans ✓ Prompt Corrective Action ✓ Troubled Asset Relief Program ✓ Real GDP Growth ✓ SP 500 index ✓ Housing price index ✓ Nominal effective exchange rate ✓ Federal funds rate ✓ Money market interest rate ✓ Mortgage rate ✓ Unemployment		Program TARP influence the scope of switching from non-stationary regimes to stationary regimes and reduce the level of non-performing loans and Real estate non-performing loans.

		✓ The average wage growth rate		
Soekapdjo, Nugroho et al. (2018)	Indonesia	✓ Financing Debt Ratio (FDR) ✓ Capital Adequacy Ratio (CAR) ✓ Operational Expense Ratio ✓ Exchange Rate ✓ Inflation ✓ Real National Income Non Performing Financing (dependent variable)	Multiple Regression method	Variables such as Debt ratio, Capital Adequacy ratio, Operational Expense ratio against Operation Income, Inflation, etc. affect the Non-performing Financing.
Louzis, Vouldis et al. (2012)	Greece	**Macroeconomic factors:** ✓ GDP Growth	✓ Baseline Model	Compared to the bank-specific variables, macroeconomic variables, such as- GDP,

		✓ Unemployment rate ✓ Lending rates **Bank specific factors:** ✓ Debt ✓ Return on Equity ✓ Solvency ratio ✓ Inefficiency ✓ Size ✓ Non-interest income ✓ The leverage ratio and size ✓ Ownership concentration	✓ Dynamic panel data estimator ✓ GMM estimations	unemployment, public debt, interest rates, etc. affect the NPLs level in the Greek banking system, while GDP and unemployment are negatively linked with NPL. However, positive and significant relationships are found among NPL, public debt and lending rates.
Akter (2017)	Bangladesh	✓ Classified loan to Total loan ✓ Interest Margin	✓ Correlation ✓ Regression analysis ✓ ANOVA	The listed companies of DSE hold 50% of the total nonperforming loans, which creates a significant

		✓ Loan to Deposit ratio ✓ Bad Debt ✓ Net Profit Margin		negative impact on banks' net profit margin.
Messai and Jouini (2013)	Italy Greece Spain	✓ GDP ✓ Unemployment rate ✓ Real Interest Rate ✓ Return on Asset ✓ Loans ✓ Bank Size NPL(dependent variable)	Multiple Regression analysis	GDP growth rate and profitability of banks' assets are negatively related to the level of NPLs. On the other hand, the unemployment rate, real interest rates are positively related to NPLs.
Kjosevski and Petkovski (2017)	Baltic States	**Bank specific determinants:** ✓ Equity to total asset ratio ✓ ROA ✓ ROE	Panel Data Analysis	NPLs' level is mostly affected by macroeconomic factors than the bank-specific factors. GDP has a significant negative relationship with NPL, Inflation and Domestic credit to the private sector have a

		✓ Growth of gross loans **Macroeconomic determinants:** ✓ Unemployment ✓ Percentage of total labor force ✓ GDP Growth ✓ Inflation ✓ Consumer prices ✓ Domestic credit to private sector NPL to total gross loans (dependent variable)		positive relationship. Besides, return on assets, return on equity, Growth of gross loans also influence NPLs. Without a sound and proper banking system, sustainable economic growth is not possible.
Dimitrios, Helen et al. (2016)	European countries (Not mentioned)	✓ Return on Equity ✓ Return on Asset	GMM Estimation	Tax on personal income and output gap create a strong positive and negative impact on NPL

		✓ Unemployment ✓ Income tax ✓ Inflation rate ✓ Government debt ✓ Loans to deposit ratio ✓ Output gap ✓ Ratio of NPL to total loans (dependent variable)		respectively. ROA and ROE are found to be negatively related to NPL. Moreover, unemployment is also a significant influencer of NPL.
Isik and Bolat (2016)	Turkey	**Bank Specific variables:** ✓ Bank size ✓ Bank capital ✓ Profitability ✓ Lending activity ✓ Credit quality ✓ Revenue Diversification	Panel Data Analysis Method	Higher profitability, revenue diversification reduces non-performing loans rate, while NPLs increases by greater capital and loan loss provisions. Among the macroeconomic variables, the GDP growth rate is found to be most significant, which influences the NPL negatively.

		Macroeconomic variables: ✓ GDP Growth ✓ Inflation rate ✓ Unemployment ✓ Economic growth rate **Crisis Control Variable:** ✓ Global economic crisis NPL (dependent variable)		
Poudel (2013)	Nepal	✓ Inflation ✓ Money supply ✓ Business cycle ✓ Market interest rate ✓ Foreign exchange rate ✓ GDP	Multiple regression analysis	An insignificant and positive relationship was found between the GDP, market interest rate and NPL, while a negative relationship was found between the money supply and NPL. However, inflation has a strong negative impact on NPL. In addition, it is found that, except these

		✓ Credit risk of banks (dependent variable)		macroeconomic factors in the analysis, other macroeconomic factors, which are excluded in the paper, influence credit risks or non-performing loans of financial institutions most.
Accornero, Alessandri et al. (2017)	Italy	✓ Net NPL Ratio ✓ Bank size ✓ ROE ✓ Share of overdraft ✓ Share of Total granted ✓ New Bad loan rate Log change in credit growth (dependent variable)	Multiple regression analysis	The profitability of the firms, opportunities for investment and credit demands are responsible for raising the NPL. Bank's lending activities are not that much affected because of the increasing level of NPL.
Anjom and Karim (2016)	Bangladesh and other SAARC Countries	**Macroeconomic Factors:** ✓ GDP	✓ Multiple Regression Analysis	Macroeconomic and Bank specific factors influence most of the non-performing loans of Bangladesh. GDP growth, interest rate, total

		✓ Real Interest Rate ✓ Inflation ✓ Public Debt **Bank Specific Factors:** ✓ Loan Growth ✓ Return on Equity ✓ Return on Asset ✓ Loan to Asset ratio ✓ Loan to Deposit Ratio ✓ Total Capital to Total Asset Ratio ✓ Non-Interest Income to Total Income Ratio ✓ Operating expense to	✓ Correlation Matrix Analysis	capital to total asset ratio, operating expense to operating income ratio and total liabilities to total asset ratio impose positive influence on NPL and Inflation, ROA, ROE, public debt are negatively related to NPL.

		Operating Income Ratio ✓ Total Liabilities to Total Asset Ratio NPL (dependent variable)		
Dinçer, Yuksel et al. (2018)	African Countries	✓ GDP Growth ✓ Industry Volume ✓ Non-Performing Loans Ratio	✓ Dumitrescu Hurlin Panel Causality Tests ✓ Levin, Lin, and Chu (LLC) panel unit root test	Industry volume and economic growth are found to be responsible for rising NPL. Because of decreasing economic growth, the level of non-performing loans is increasing and when industry volume is decreased, economic growth will be decreased as well.
Škarica (2014)	✓ Bulgaria ✓ Croatia ✓ Czech ✓ Hungary ✓ Latvia ✓ Romania	✓ GDP rate ✓ Unemployment ✓ Inflation rate ✓ Nominal Effective Exchange rate	✓ Difference GMM Model ✓ System GMM Model	A significant negative relationship was found between GDP and NPL and inflation is positively related to NPL. In addition, NPL responds negatively with the appreciation of exchange rates.

	✓ Slovakia	✓ Consumer Price index ✓ Share Price Index ✓ Money Market interest rate ✓ The ratio of NPLs to total loans (dependent variable)		
(Akinlo and Emmanuel 2014)	Nigeria	✓ Inflation ✓ Lending rate ✓ Exchange rate ✓ Money supply ✓ Total credit to the private sector ✓ Unemployment rate	✓ Descriptive statistics ✓ Unit root test ✓ Error Correction Model	NPL hits the economic growth of Nigeria too much. In addition, NPL is influenced most positively in the long run by unemployment, credit to the private sector and exchange rate. However, the exchange rate, lending rate, stock market index and credit to the private sector are found to be the most influential factors of non-performing loans in the short run.

		✓ The stock market price index ✓ Gross Domestic Product ✓ Non-Performing Loan (dependent variable)		
(Turan and Koskija 2014)	Albania	✓ Unemployment rate ✓ Loan interest rate ✓ Real GDP ✓ Inflation ✓ Remittance ✓ Non-Performing Loan (dependent variable)	✓ Unit root test(ADF) ✓ Descriptive statistics ✓ Johansen co-integration test	Because of the carelessness of banks of Albania on giving loans, an economic crisis happens. Unemployment, inflation, loan interest rate are positively related to NPL, while Real GDP and remittance effect the NPL negatively. However, the co-integration among the variables is found to be weak.

(CLICHICI44 and COLESNICOVA45 2014)	Republic of Moldova	✓ Exports ✓ GDP ✓ Remittance ✓ Unemployment ✓ Private indebtedness ✓ Non-Performing Loan (dependent variable)	✓ Econometric multivariate linear regression analysis	NPLs are influenced by both banks' internal and macroeconomic environment. GDP, exports and remittances are negatively related to NPL; while unemployment and private indebtedness affect the NPL positively.
(Ahmad and Bashir 2013)	Pakistan	✓ Real exchange rate ✓ Annual growth in GDP ✓ Consumer Price Index ✓ Industrial production ✓ Foreign Direct Investment	✓ Unit root test ✓ Correlation matrix ✓ OLS	GDP, inflation rate, interest rate, exports, CPI and industrial production create a significant impact on NPL; in which GDP, inflation rate, industrial production, interest rate, and exports have negative and CPI has a positive effect on NPL. On the other hand, the exchange rate, unemployment, and FDI are found to be insignificantly related to the

		✓ Real interest rate ✓ Unemployment rate ✓ Inflation rate ✓ Non-Performing Loan (dependent variable)		NPL. These variables somehow affect the non-performing loan most, which is responsible for financial vulnerability.

For the last few decades, Non-Performing Loans (NPLs) (default loan or near being in default) have become a troublesome and one of the most critical issues in the whole world, because of which banks' profitability and liquidity hamper. Overall economic growth is negatively affected by the increased amount of non-performing loans. NPLs respond to macroeconomic, bank-specific and other global factors. Moreover, wrong customer selection, strong competition, poor management, lack of supporting facilities, poor cash flow, delayed disbursement of funds, absence of proper monitoring- are the general reasons behind the NPLs. In addition, macro fundamental factors such as- lower GDP, unemployment rate, inflation rate, interest rate, the exchange rate can be considered as the root causes of NPLs. However, because of bank-specific factors (credit growth, bank size, risk-taking, return on asset, return on equity, solvency, inefficiency, liquidity) and global factors, NPLs arise.

The increasing amount of NPL has become a headache for the overall world. In overall Asia, 6.02% is the non-performing loan of the total gross loan amount in 2017 (Rosenkranz and Lee 2019). Due to the increased amount of NPLs, many studies have been made throughout the world to find out the determinants of NPLs. According to all of those analyses, different conclusions have found out regarding NPLs. Macroeconomic and bank-specific variables- both affect the amount of non-performing loans (Klein 2013, Abid, Ouertani, et al. 2014, CLICHICI44 and COLESNICOVA45 2014, Makri, Tsagkanos, et al. 2014, Amuakwa–Mensah, and Boakye–Adjei 2015, De Backer, Du Caju et al. 2015, Anjom and Karim 2016, Isik and Bolat 2016, Morakinyo and Sibanda 2016, Rajha 2016). As external economic factors are uncontrollable and effects the overall performance of the financial institutions, so compared to the bank-specific factors, NPLs react most by the macroeconomic factors (Louzis, Vouldis, et al. 2012, Klein 2013, Polodoo, Seetanah, et al. 2015, Kjosevski and Petkovski 2017), while opposite conclusions were made by-(Amuakwa–Mensah, and Boakye–Adjei 2015, Haniifah 2015, Dimitrios, Helen, et al. 2016, Rifat 2016). In the European countries, NPLs found to increase when unemployment rises, the exchange rate depreciates and inflation is high (Louzis, Vouldis, et al. 2012, Klein 2013, Škarica 2014, Turan and Koskija 2014). However, opposite findings are found in-(Shingjergji 2013). The insignificant relationship has found out between GDP, interest rate, inflation, exchange rate and NPLs (Haniifah 2015). In general

sense, GDP and NPLs should be strongly negatively related, because higher GDP mostly expresses a strong economic condition of the particular country and non-performing loans cannot exist too much in the countries having strong economic conditions. (Ahmad and Bashir 2013, Messai and Jouini 2013, Abid, Ouertani et al. 2014, CLICHICI44 and COLESNICOVA45 2014, Hà and Diệp 2014, Makri, Tsagkanos, et al. 2014, Škarica 2014, Turan and Koskija 2014, Ekanayake and Azeez 2015, Ghosh 2015, Haniifah 2015, Tanasković and Jandrić 2015, Beaton and Myrvoda 2016, Isik and Bolat 2016, Rajha 2016, Kjosevski and Petkovski 2017, Dinçer, Yuksel, et al. 2018). On the other hand, a positive relationship has been found out between GDP and NPLs (Poudel 2013, Shingjergji 2013, Anjom and Karim 2016). Moreover, banks' profitability also influences the NPLs to some extent. Banks that are profitable and have lower exposure to the household sectors tend to have lower NPLs (Beaton and Myrvoda 2016, Isik and Bolat 2016). Money supply (broad money) is also found to be a strong influencer of NPL, but its impact is ambiguous; as it can create both positive and negative impacts on NPL. Thus, though money supply is used in a few papers as independent variables, dissimilar results are found (Poudel 2013, Morakinyo and Sibanda 2016). Because of rising domestic credit to the private sector (loans, purchases of securities, trade credits, account receivables), the probability of increasing NPL exits. So, must be there is a positive impact of credit to the private sector on NPL (Akinlo and Emmanuel 2014, CLICHICI44 and COLESNICOVA45 2014, Beaton and Myrvoda 2016, Kjosevski and Petkovski 2017). On the other hand, NPL use to response negatively with remittance, as remittance inflow lets the general people not to take excessive loans from banks and the decreased amount of loans tend to decrease the NPLs. Thus, NPL is negatively related with remittance (CLICHICI44 and COLESNICOVA45 2014, Turan and Koskija 2014). In a nutshell, various papers of the world (Asia, Africa, Europe, America) found out that sometimes banks management, performance (profitability) and other internal specific factors and sometimes external economic determinants (GDP, Inflation, money supply, private credit, remittances, exchange rates) are responsible for the rising level of NPL, which is now a most mooted factor of the world (Klein 2013, Abid, Ouertani, et al. 2014, Hà and Diệp 2014, Makri, Tsagkanos, et al. 2014, Amuakwa–Mensah and Boakye–Adjei 2015, Ghosh 2015, Polodoo, Seetanah et al. 2015, Tanasković and Jandrić 2015, Beaton and Myrvoda

2016, Dimitrios, Helen et al. 2016, Morakinyo and Sibanda 2016, Accornero, Alessandri et al. 2017, Jiang, Kanas et al. 2018).

NPL has been one of the most notable issues of the banking sector in Bangladesh for a couple of decades and it is facing challenges to control the level of NPL. Being a developing country, certainly increased amount of NPL is most frightening. As our economic growth is mostly dependent on banks, when NPL increases, banks' profitability reduces, which may hamper economic growth. Due to excessive competition, incomplete documentation, illogical credit approval, political influence; NPL is rising which is unfavorable. However, both macroeconomic and bank-specific variables can be considered as responsible for NPLs. The inflation rate has positive and the interest rate has a negative relationship with NPLs ratio. On the other hand, the GDP growth rate and unemployment rate are proved as insignificant to the NPLs (Mondal 2016). Other than the macroeconomic variables, firm-specific variables (loan growth, loan to asset ratio, return on asset, size of the firm) are found to be more significant. In addition, the banks which are more aggressive in the credit market of Bangladesh, tend to have lower NPLs compared to less aggressive banks. Broad money is found to be the most significant factor for rising NPL (Rifat 2016). Unlike the other studies, a positive relationship is found between NPL and GDP, which reveals that an increased amount of GDP pushes the NPL to rise (Anjom and Karim 2016). Considering all the listed banks in Dhaka Stock Exchange, the ratio of non-performing loans is very high and it contains 50% of the total non-performing loans in the country. To run successfully in the market, lending must be the most powerful instrument for commercial banks and thus the increased amount of non-performing loans affects the banks' profitability (Akter and Roy 2017).

CHAPTER III: RESEARCH METHODS

3.1 Variable Definition and Sources

a) **Non-Performing Loans:** When a loan taker or borrower fails to repay interest or principal on a loan, then the loan is considered as the default loan; and the default loan is viewed as the non-performing loan. NPLs affect the profitability of banks as it minimizes banks' capacity to give new loans. For finding out the determinants which influence NPLs most, several researchers adopted different models. As panel data provide more variability, information, efficiency; Panel Data Analysis is used in many papers in which, NPL is found to be the dependent variable- (Abid, Ouertani, et al. 2014, Tanasković and Jandrić 2015, Isik and Bolat 2016, Morakinyo and Sibanda 2016, Rajha 2016, Kjosevski and Petkovski 2017). In some studies, VAR approach and GMM Estimations are found to be applied in order to get the influential determinants of NPLs- (Louzis, Vouldis, et al. 2012, Klein 2013, Makri, Tsagkanos, et al. 2014, Škarica 2014, Ghosh 2015, Polodoo, Seetanah et al. 2015, Beaton and Myrvoda 2016, Dimitrios, Helen, et al. 2016). In this study, the ARDL approach is followed, along with unit root test to expose which macro-economic factors impacts NPLs most.

b) **Broad Money:** Broad Money is considered as the indicator of money supply, which refers to total usable money available in the economy, including cash, money in a savings account, short time deposits, etc. As an economic indicator, broad money assists to determine the liquidity of an economy. In this study, Broad Money is used as an independent variable, which affects the NPLs. BM can affect the NPL both positively and negatively. BM influences NPL negatively in two probable ways- Firstly, the increased amount of money supply enhances the general people's ability to spend more. When there is adequate money in the economy, the probability of taking loans from banks tends to decrease. Thus NPL will decrease because of the decreased amount of loans. Secondly, as people have adequate money to survive, so they can easily repay the previous loans, by which the number of default loans decreased. On the contrary, NPL can be affected positively by BM too. Because of the increased amount of money in the economy,

people will prefer to save the excess amount rather than spending the whole. Because of the huge savings in the banks, banks will try to provide loans at a lower interest rate. Lower interest rate attracts the investors to take loans, by which non-performing loans response positively. BM is found to be an independent variable, included in fixed-effect regression analysis, panel model pooled regression analysis in some studies respectively- (Morakinyo and Sibanda 2016, Rifat 2016, THUO 2017).

c) **Domestic credit to Private sector:** Domestic credit to private sector includes all the financial resources given to the private sector of a country through trade credits, loans, account receivables, purchases of securities by other financial corporations with a condition of repayment of the credit. When the private sector; including business, households and other institutions receive domestic credits, they will prefer to utilize it by repaying the previous loans taken from another international source. In addition, trade credit facilities enable borrowers, especially business to make short term financial growth. Because of no interest payments on trade credit, the private sector uses this opportunity and can create a robust internal economic environment. This credit can be easily paid back and the non-performing loans will tend to decrease. Moreover, the private sector can sell the account receivables to get immediate cash, which is also considered as domestic credit. By doing so, institutions can generate cash flow and can make successful investments. Later, money can be easily paid. On the other hand, DCP can affect the NPL positively in such a way that, the increased level of credits pushes the default loans to be higher. Though it is a very rare case, political factors can be a great influencer of this positive relations. This variable was used in a paper as an independent variable-(Kjosevski and Petkovski 2017)

d) **Domestic credit by the financial sector:** The financial sector includes banks, insurance companies, leasing companies, microfinance institutions, monetary authorities. Domestic credit by the financial sector refers to all credit to several sectors on a gross basis, including the credit to the central government. Along with the private sector, the government also takes domestic credits to invest in different development projects. Like the credit to the private sector, the impact of domestic

credit by the financial sector on NPL is almost the same; the difference is just having the involvement of the government. This variable is found to be an independent variable in this study-(Morakinyo and Sibanda 2016).

e) **Financial Volatility:** Volatility is simply a concept to expose fluctuation in prices. Here, financial volatility refers to a measurement that how much rising and falling happens in the stock prices. The more fluctuations in the price, the more volatile the stock market is. The stock price was found to be used in a study as an independent variable- (Tanasković and Jandrić 2015). Too much movement in stock prices is often tremendous for an economy. So when huge fluctuations happen in stock prices, the investors, who took loans from the banks, may become a defaulter because of losing money in the stock market. This is how volatility influences NPL positively. However, because if the stock prices are found to be more volatile, stock market investors will take fewer loans from the banks and thus the amount of non-performing loans will be decreased. This is how NPL can be effected both positively and negatively by Financial volatility.

f) **Remittance Inflow:** Remittance refers to the amount of money that is transferred to the home country from the individuals working in the outside countries. Remittance is positively related to money flow but creates both adverse and positive impacts on non-performing loans. Because when people get the remittances, they will like to utilize that money rather than taking loans; and when the loan amount decreases, certainly non-performing loans will decrease as well. This negative relationship was also found in a study, where remittance was considered as an independent variable-(CLICHICI44 and COLESNICOVA45 2014, Turan and Koskija 2014). However, when people have more money in their hands, they can prefer savings as well. Then banks will try to provide loans because of the gathering of huge deposits. Investors can be attracted to take loans at a lower interest rate. Thus, NPL will increase along with the increased amount of loans. This is how NPL can be influenced both positively and adversely with remittance.

g) **Trade Openness:** Trade openness is nothing but the summation of imports and exports connected with GDP. More specifically, trade openness is considered as a disclosure of how open or strict trade relationship exists with one country with the other countries of the world. The trade to GDP ratio is often called the Trade Openness ratio, which is measured by a simple average of total trade relative to GDP. Like the other factors, trade openness can also have a positive and negative impact on NPL. However, the impact should be negative mostly, because often the international transactions make the economy more strong. When the export-import is more, banks' capital will be increased as well and thus NPL decreases. But the relationship may be different because of other uncontrollable external factors, especially political influences. Trade openness is found to be as an explanatory variable to determine the financial stability, where GMM estimation was used in a paper- (Creel, Hubert, et al. 2015)

Table 9: Variable Definitions

Variables	Definition	Expected signs
Dependent Variable		
Non-performing Loans (NPL)	Non-performing loans arise when loan takers fail to repay the interest or principal on loans, which negatively affect the banks' performance.	
Independent Variables		
Broad Money (BM)	Broad Money includes total money available in the economy (cash, money in a savings account, short time deposits, etc)	(+)(−)
Domestic credit By Financial sector (DBD)	Domestic credit by the financial sector refers to all credit to several sectors on a gross basis, except the credit to the central government.	(−)
Domestic Credit by Private sector (DCP)	Domestic credit to the private sector includes all the financial resources given to the private sector of a country through trade credits, loans, purchases of securities by other financial corporations.	(−)
Financial Volatility (FDV)	Financial volatility is a degree to express how much rising and falling happens in the stock prices. The more fluctuations in the price, the more volatile the stock market is.	(−)
Remittance inflow (RE)	Remittance refers to the amount of money that is transferred to the home country from the individuals working in the outside countries.	(−)
Trade Openness (TO)	Trade openness is considered as a disclosure of how open or strict trade relationship exists with one country with the other countries of the world.	(−)

3.2 Methodology

3.2.1 Unit Root Test

To identify whether the time series variables are stationary or not, the unit root test is applied. When a shift in time causes no impact in the shape of variable, then the time series variable is considered to be stationary; otherwise, it will be assumed as non-stationary. After the initial development of unit root by John von Neumann, James Durbin and Geoffrey Waston; the use of unit root test in autoregressive models was further developed by Denis Sargon and Alok Bhargava. Among the various kinds of unit root test, Dickey-Fuller Test, Augmented Dickey-Fuller Test, Zivot –Andrews Test, ADF-GLS Test, Phillips Perron test, KPSS Test, etc. are most common. When the time series variables are stationary, it becomes easy to forecast future outcomes; as mean, variance and covariance remain constant.

However, a complication arises in the case of non-stationary time series. Thus, the absence of a unit root is often expected. When a unit root is found in the time series variable, d (order of integration), will change the time series variable into stationarity. This is how the non-stationary time series variables can be transferred to stationary for ease of further calculations. Generally, I(0) or I(1) can be enough as the order of integration. I(2) or more are rarely visible. To get the most reliable outcome it is obvious to conduct a unit root test before going to the further test.

Augmented Dickey-Fuller Test (ADF):

In 1979, the two statisticians named, David Dickey and Wayne Fuller developed the Dickey-Fuller Test, which was the most common and simplified method of testing the null hypothesis that whether a unit root is present in the time series variables. But, the Dickey-Fuller Test was just confined to a small number of samples. That is the reason why within a few years, in 1984, this test was modified and became more powerful and then it became able to work with larger and more complex time series variables and can allow higher-order autoregressive processes. Thus this new test was named as Augmented Dickey-Fuller Test. The ADF test is now applied to complex models, which include unknown orders. This test is not only confined to statistics, but also applied a lot

in mathematics, econometrics, and computer science. Like the Dickey-Fuller Test, the null hypothesis in the ADF test expresses the presence of unit root and the alternate hypothesis indicates the absence.

Examining the stationary properties in the long-run relationship of time series variables can be determined by the following equation,

Equation 1: ADF Test

$$\Delta Y_t = \alpha_0 + \alpha_1 Y_{t-1} + \sum_{j=1}^{k} d_j \Delta Y_{t-j} + \varepsilon_t$$

Here, Y_t is a time series, Δ is the first difference operator, α_0 is the constant, k is the optimum number of lags of the dependent variable and, ε_t is the pure white-nose error term. To accept or reject the null hypothesis, it is needed to compare the P values of the required time series variable with the significance level. The higher amount of P-value than the significance level indicates the acceptance of the null hypothesis. So, the concluding fact is that the more negative the P-value is, the stronger will be the rejection of the null hypothesis. For running the test, it is obvious to select the lag length. But, when the lag differences start to increase, the ADF test is found to be unable to distinguish between I(1) and any kind of fractional I(d) process (Hassler and Wolters 1994). Though the ADF test is relatively more powerful than the DF test, it contains the type 1 error rate.

Phillips-Perron Test (PP):

Phillips-Perron Test is another kind of procedure to test unit root in time series variables, which was proposed in 1987 by an econometrician Peter C.B. Phillips. This test was actually the result of Ph.D. studies of a Canadian econometrician Pierre Perron under Peter C. B. Phillips. Phillips- Perron Test is a non-parametric approach, which allows for a very large range of time series variables to test the unit root. This test contains significant benefits when in the time series, there is the presence of moving average components (Phillips and Perron 1988). Like the ADF test, the PP test also stands for testing whether a variable has unit root or not. Here, the null hypothesis is that the variable includes unit root and the alternative is the time series variable is stationary.

PP unit root test is used by the following equation,

Equation 2: PP Test

$$\Delta Y_t = \alpha + \rho * Y_{t-1} + \varepsilon_t$$

Here, $\rho *$ is the estimated coefficient. Phillips –Perron Test is found to be stronger than the DF and ADF test when there is inexplicit autocorrelation heteroscedasticity in the errors. Moreover, this test emendates the test statistics.

Kwiatkowski- Phillips-Schmidt-Shin Test (KPSS):

KPSS stands for testing the presence of unit root in the time series variables, which was proposed by Denis Kwiatkowski, Peter C.B. Phillips, Peter Schmidt and Yongcheol Shin in 1992. Unlike the ADF and PP tests, here the null hypothesis expresses the time series variables to be stationary and thus the alternative hypothesis indicates the presence of unit root. This test is the summation of three parts- a deterministic trend, a random walk and a stationary error (Kwiatkowski, Phillips, et al. 1992).

The equation that it follows can be derived by three parts,

Equation 3: KPSS Test

$$\Delta Y_t = r_t + \beta_t + \varepsilon_t$$

Here, r_t is the random walk, β_t is the deterministic trend and ε_t is a stationary error. It is often seen that the null hypothesis in this test is most of the time rejected, which means it also holds a type 1 error. But, the combination of both KPSS and ADF tests can reduce the problem of rejecting the null hypothesis.

3.2.2 ARDL and Linear ARDL Bound Testing

In 1999, the autoregressive distributed lag model was proposed firstly by M. Hashem Pesaran and Yongcheol Shin. It is an economical lag distributed model, which deals with infinite numbers of parameters. For a few decades, the ARDL method has been using in econometrics only. But in recent years, it has found to be used in analyzing the cointegrating relationships among the variables. In this study, the ARDL approach is used because of finding the relationship between the NPL and the other macro

fundamental factors (BM, DBD, DCP, FDV, RE and TO). ARDL method is found to be efficient because of the following reasons- firstly, it does not require only large samples. Secondly, it contains the ability to estimate both long-run and short-run components. Finally, dependent and independent variables can be differentiated by this method (Pesaran and Shin 1998). However, there are some specific assumptions of the model- there should not be any autocorrelation among the error terms, variance and covariance must be constant, if stationary of the variable is found in I(2), this model won't work. Several papers applied the ARDL approach to finding out the effect of the determinants of non-performing loans- (Adebola, Yusoff, et al. 2011, Badar and Javid 2013, Inekwe 2013, Nikolaidou and Vogiazas 2013, Morakinyo and Sibanda 2016).

Linear ARDL bound test is an approach developed by Pesaran in 2001, to find out whether a long-run relationship exists between the dependent and the other independent variables. The bound test is considered as a test for cointegration among the variables with the integration of different orders, not more than I(1). According to the study of (Alimi 2014), ARDL bound testing approach provides more reliable results when the sample size is small and this method can simultaneously estimate the short-run and long-run parameters. In this study, NPL is selected as the dependent variable and the other six independent variables are- BM, DBD, DCP, FDV, RE, and TO. By applying the bound test, accurate results can be found. By considering each of the variables as dependent variable each time, it has been tried in this research to find out the most appropriate model for future analysis with the formulation of the Unrestricted Error Correction Model (UECM), which is stated below-

Equation 4: Linear ARDL Bound Test

$$\begin{bmatrix} \Delta\, ln(NPL)_t \\ \Delta\, ln(BM)_t \\ \Delta\, ln(DCP)_t \\ \Delta\, ln(DBD)_t \\ \Delta\, ln(FDV)_t \\ \Delta \ln(RE)_t \\ \Delta\, ln(TO)_t \end{bmatrix} = \begin{bmatrix} \delta_1 \\ \delta_2 \\ \delta_3 \\ \delta_4 \\ \delta_5 \\ \delta_6 \\ \delta_7 \end{bmatrix} + \begin{bmatrix} \Delta\, ln(NPL)_{t-1} \\ \Delta\, ln(BM)_{t-1} \\ \Delta\, \ln(DCP)_{t-1} \\ \Delta\, ln(DBD)_{t-1} \\ \Delta \ln(FDV)_{t-1} \\ \Delta \ln(RE)_{t-1} \\ \Delta\, ln(TO)_{t-1} \end{bmatrix} \begin{bmatrix} \theta_{11}\ \theta_{12}\ \theta_{13}\ \theta_{14}\ \theta_{15}\ \theta_{16}\ \theta_{17} \\ \theta_{21}\ \theta_{22}\ \theta_{23}\ \theta_{24}\ \theta_{25}\ \theta_{26}\ \theta_{27} \\ \theta_{31}\ \theta_{32}\ \theta_{33}\ \theta_{34}\ \theta_{35}\ \theta_{36}\ \theta_{37} \\ \theta_{41}\ \theta_{42}\ \theta_{43}\ \theta_{44}\ \theta_{45}\ \theta_{46}\ \theta_{47} \\ \theta_{51}\ \theta_{52}\ \theta_{53}\ \theta_{54}\ \theta_{55}\ \theta_{56}\ \theta_{57} \\ \theta_{61}\ \theta_{62}\ \theta_{63}\ \theta_{64}\ \theta_{65}\ \theta_{66}\ \theta_{67} \\ \theta_{71}\ \theta_{72}\ \theta_{73}\ \theta_{74}\ \theta_{75}\ \theta_{76}\ \theta_{77} \end{bmatrix} +$$

$$\sum_{s=1}^{q} \begin{bmatrix} \mu_{11s}\ \mu_{12s}\ \mu_{13s}\ \mu_{14s}\ \mu_{15s}\ \mu_{16s}\ \mu_{17s} \\ \mu_{21s}\ \mu_{22s}\ \mu_{23s}\ \mu_{24s}\ \mu_{25s}\ \mu_{26s}\ \mu_{27s} \\ \mu_{31s}\ \mu_{32s}\ \mu_{33s}\ \mu_{34s}\ \mu_{35s}\ \mu_{36s}\ \mu_{37s} \\ \mu_{41s}\ \mu_{42s}\ \mu_{43s}\ \mu_{44s}\ \mu_{45s}\ \mu_{46s}\ \mu_{47s} \\ \mu_{51s}\ \mu_{52s}\ \mu_{53s}\ \mu_{54s}\ \mu_{55s}\ \mu_{56s}\ \mu_{57s} \\ \mu_{61s}\ \mu_{62s}\ \mu_{63s}\ \mu_{64s}\ \mu_{65s}\ \mu_{66s}\ \mu_{67s} \\ \mu_{71s}\ \mu_{72s}\ \mu_{73s}\ \mu_{74s}\ \mu_{75s}\ \mu_{76s}\ \mu_{77s} \end{bmatrix} \begin{bmatrix} \Delta \ln(NPL)_{t-1} \\ \Delta\, ln(BM)_{t-1} \\ \Delta\, \ln(DCP)_{t-1} \\ \Delta\, ln(DBD)_{t-1} \\ \Delta\, ln(FDV)_{t-1} \\ \Delta \ln(RE)_{t-1} \\ \Delta\, ln(TO)_{t-1} \end{bmatrix} + \begin{bmatrix} \varepsilon_{1t} \\ \varepsilon_{2t} \\ \varepsilon_{3t} \\ \varepsilon_{4t} \\ \varepsilon_{5t} \\ \varepsilon_{6t} \\ \varepsilon_{7t} \end{bmatrix}$$

Where Δ refers to the first difference operator, $\delta_1\ to\ \delta_7$ refers to constant terms, $\theta_{11}\ to\ \theta_{77}$ refers as long-run coefficients, $\mu_{11}\ to\ \mu_{77}$ refers to short-run coefficients. F test needs to be conducted for fulfilling the bound test. Critical values regarding the F test can be obtained from Pesaran, Shin et al. (2001). By comparing the upper and lower bound critical values with the value of f-statistics, the final decision can be taken. For doing that, the following hypothesis has been considered,

$$H_0(Null\ Hypothesis) = \begin{Bmatrix} \theta_{11} = \theta_{12} = \theta_{13} = \theta_{14} = \theta_{15} = \theta_{16} = \theta_{17} \\ \theta_{21} = \theta_{22} = \theta_{23} = \theta_{24} = \theta_{25} = \theta_{26} = \theta_{27} \\ \theta_{31} = \theta_{32} = \theta_{33} = \theta_{34} = \theta_{35} = \theta_{36} = \theta_{37} \\ \theta_{41} = \theta_{42} = \theta_{43} = \theta_{44} = \theta_{45} = \theta_{46} = \theta_{47} \\ \theta_{51} = \theta_{52} = \theta_{53} = \theta_{54} = \theta_{55} = \theta_{56} = \theta_{57} \\ \theta_{61} = \theta_{62} = \theta_{63} = \theta_{64} = \theta_{65} = \theta_{66} = \theta_{67} \\ \theta_{71} = \theta_{72} = \theta_{73} = \theta_{74} = \theta_{75} = \theta_{76} = \theta_{77} \end{Bmatrix} = 0$$

$$H_1(Alternative\ Hypothesis) = \begin{Bmatrix} \theta_{11} \neq \theta_{12} \neq \theta_{13} \neq \theta_{14} \neq \theta_{15} \neq \theta_{16} \neq \theta_{17} \\ \theta_{21} \neq \theta_{22} \neq \theta_{23} \neq \theta_{24} \neq \theta_{25} \neq \theta_{26} \neq \theta_{27} \\ \theta_{31} \neq \theta_{32} \neq \theta_{33} \neq \theta_{34} \neq \theta_{35} \neq \theta_{36} \neq \theta_{37} \\ \theta_{41} \neq \theta_{42} \neq \theta_{43} \neq \theta_{44} \neq \theta_{45} \neq \theta_{46} \neq \theta_{47} \\ \theta_{51} \neq \theta_{52} \neq \theta_{53} \neq \theta_{54} \neq \theta_{55} \neq \theta_{56} \neq \theta_{57} \\ \theta_{61} \neq \theta_{62} \neq \theta_{63} \neq \theta_{64} \neq \theta_{65} \neq \theta_{66} \neq \theta_{67} \\ \theta_{71} \neq \theta_{72} \neq \theta_{73} \neq \theta_{74} \neq \theta_{75} \neq \theta_{76} \neq \theta_{77} \end{Bmatrix} = 0$$

In detail,

H_0= There is no long-run relationship among the variables

H_1= There is a long-run relationship among the variables

For decision making, whether the null hypothesis will be accepted or not, the following criteria have been proposed by Pesaran, Shin et al. (2001).

Table 10: Decision-Making Criteria for Bound Test

Condition	Decision
$F_s >$ Upper bound of critical value	Rejecting H_0 (Confirms Co-integration)
$F_s <$ Lower bound of critical value	Accepting H_0 (Confirms No Co-integration)
$F_s \leq$ Upper bound and $\geq$ lower bound of critical value	No Conclusive Decision

Now, the ARDL test is conducted to estimate the long-run coefficients separately for each of the independent variables to find out the relationship with the non-performing loan. It is crucial to find out the most appropriate lag as a regressor, as the standard error of the coefficient estimates increases due to considering too many lags. While using time series data for the research, Pesaran, Shin et al. (2001) suggested that the maximum lag length is 2. The following model has been used to estimate the long-run coefficients,

Equation 5: Long Run ARDL Test

$$NPL_t = \theta_0 + \theta_1 \sum_{i=1}^{p} NPL_{t-1} + \theta_2 \sum_{i=1}^{p} BM_{t-1} + \theta_3 \sum_{i=1}^{p} DCP_{t-1} + \theta_4 \sum_{i=1}^{p} DBD_{t-1} + \theta_5 \sum_{i=1}^{p} FDV_{t-1} + \theta_6 \sum_{i=1}^{p} RE_{t-1} + \theta_7 \sum_{i=1}^{p} TO_{t-1} + \emptyset_1$$

After finding the evidence of the long-run relationship among non-performing loans and the other six variables, now short-run coefficient estimation is possible by formulating the error correction model. In the Error Correction Model, the Error Correction Term refers to the speed of adjustment of the dependent variable to equilibrium after a short term shock of all the variables. Following model has been used to find the short-run coefficients,

Equation 6: Short Run ARDL Test

$$\Delta NPL_t = \mu_0 + \mu_1 \sum_{i=1}^{p} \Delta NPL_{t-1} + \mu_2 \sum_{i=1}^{p} \Delta BM_{t-1} + \mu_3 \sum_{i=1}^{p} \Delta DCP_{t-1} + \mu_4 \sum_{i=1}^{p} \Delta DBD_{t-1} + \mu_5 \sum_{i=1}^{p} \Delta FDV_{t-1} + \mu_6 \sum_{i=1}^{p} \Delta RE_{t-1} + \mu_7 \sum_{i=1}^{p} \Delta TO_{t-1} + nECT_{t-1} + \emptyset_1$$

3.2.3 OLS Regression Model

In simple words, OLS is a statistical regression analysis that estimates the relationship between one dependent and one or more independent variables. In this study, OLS has been applied to find out the strength of the relationship between the variables. Findings of ARDL become stronger with the support of OLS, however, the results of this study are focused on ARDL findings rather than OLS.

CHAPTER IV: RESEARCH FINDINGS

4.1 Unit Root Test

Unit Root test (Test of stationarity in time series) is formed in the research to find out whether non-stationarity exists in the variables or time series. Augmented Dickey-Fuller Test (ADF), Phillips-Perron (PP) and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) - are used in this study to test unit root. To identify the existence of stationarity or non-stationarity, combined results of the three tests may provide more accurate information. The estimated results are presented below in Table 11.

Firstly, the Augmented Dickey-Fuller Test (ADF) has been used to test the stationarity, in which H_0= there is a unit root in the time series; thus the alternative hypothesis, H_1 = the time series is stationary or there is no presence of unit root in the time series. The study runs with 7 variables (BM, DBD, DCP, NPL, FDV, RE and TO) and stationarity of each of the variables are tested in both level and first difference (Δ) The results were conducted by comparing the significance level 0.05 with the P values of each variable. At level, the P values of all of the 7 variables are higher than 0.05 (significance level). So, there is a unit root in the time series and the H_0 is accepted. On the other side, while looking at values in the first difference (Δ), it is visible that the P values of all the variables are quite less than 0.05, which means there is no unit root in the time series and thus (H_0) is rejected.

Like the ADF test, the PP test has been used to find out the stationarity. Looking into the values of the variables at level, the P values of all the variables are higher than the significance level (0.05) and the concluding fact is that there is a unit root in the time series. Thus, H_0 is accepted. On the contrary, all the P values at first difference (Δ) are lower than the significance level (0.05), which indicates that the time series is stationary or there is no unit root in the time series and thus the H_0 is rejected.

KPSS test is another tool to identify if a time series is stationary or non-stationary because of the presence of unit root. Unlike the two tests stated above, here the null and alternative hypothesis are reverse- H_0= the time series is stationary or there is no unit root and H_1= the time series is not stationary or there is a unit root in the time series. The

results are made by comparing the P values of each variable with the critical value of the 5% significance level. It is expected that the value of LM statistics should be lower than the Critical value and thus the null hypothesis will be accepted. In this study, the critical value at a 5% significance level is 0.463. At level, the LM statistics of all the variables (except TO) are higher than the 0.463, which indicates that the time series is not stationary and the null hypothesis is rejected. But, the LM statistics value of TO is 0.1553, which is lower than the critical value and thus the concluding fact is that the time series is stationary. At first difference (Δ), except BM and FDV, all the variables have lower LM statistics value than the critical value and so the null hypothesis is accepted here. Thus, the fact is that the stationarity test in BM and FDV cannot be proved by KPSS too.

The concluding fact is that ADF and PP have found out the stationarity in time series in all of the variables but through the KPSS test, stationarity has been found only in five variables. By considering the fact of the probability of type 1 error in these three tests, the conclusion can be the presence of stationarity in the time series of all the variables based on the combined result found from these tests.

Table 11: Unit Root Test Result

Unit Root Test					
Variables	**ADF**		**PP**		**KPSS**
	T statistics	**P-Value**	**T statistics**	**P-value**	**LM-S**
BM	1.840	0.999	1.841	0.999	0.753
ΔBM	-4.762	0.000	-4.773	0.000	0.526
DBD	0.831	0.993	0.831	0.993	0.760
ΔDBD	-4.543	0.000	-4.524	0.000	0.280
DCP	2.129	0.999	1.893	0.999	0.785
ΔDCP	-4.821	0.000	-4.808	0.000	0.445
NPL	-1.091	0.708	-0.751	0.820	0.544
ΔNPL	-3.880	0.005	-3.578	0.011	0.136
FDV	-0.920	0.771	-1.663	0.442	0.657
ΔFDV	-12.627	0.000	-12.643	0.000	0.500
RE	-2.072	0.257	-1.573	0.487	0.658

ΔRE	-4.377	0.001	-4.505	0.000	0.171
TO	-1.409	0.569	-1.801	0.375	0.155
ΔTO	-6.045	0.000	-6.136	0.000	0.122

Note 1: Δ represents the first difference; **Note 2:** FDV for financial volatility, BM for broad money, DBD for domestic credit by financial sectors, DCP for domestic credit to private sectors, NPL for non-performing loan, RE for remittance inflow, TO for trade openness, ADF for Augmented Dickey-Fuller, PP for Phillip-Perron, KPSS for Kwiatkowski-Phillips-Shin; **Note 3:** Null hypothesis refers presence of unit root for ADF and PP tests and absence of unit root for KPSS test.

4.2 Linear ARDL Bound Test

At first, it is obvious to know whether a long-run relationship exists between dependent and independent variables. If the long-run relationship is found, then the long run results are estimated separately for each of the independent variables. Linear ARDL Bound test (Table 12) helps to know the existence of the long-run relationship.

To accept or reject the null hypothesis, it is required to compare the upper bound and lower bound critical values with F statistics. In this study, at a 5% significance level, the upper bound value is 3.28 and the lower bound value is 2.27. After considering the critical value and F-statistics, it has been found that, when NPL is the dependent variable, there is cointegration among all the seven variables, because the calculated F-statistics (3.911301) is higher than the upper bound critical value (3.28). The same findings are found when DCP and FDV are dependent, others are independent. But different results found when BM, DBD, RE, and TO are considered as dependent variables, that is no long-term relationship is found.

As our main focus of the study is to identify the relationship among non-performing loans and other six macroeconomic variables, so the result of the linear bound test considering only NPL as the dependent variable is our concern and through this model, a long-run relationship is found.

Table 12: Linear ARDL Bound Test Result

Linear ARDL Bound testing		
Panel –A: Long-run co-integration estimation	**F-statistics**	**Co-integration**
$F(\ln npl) = (\ln npl/\ln dcp, \ln dbd, \ln fdv, \ln re, \ln to, \ln BM)$	3.911	Yes
$F(\ln BM) = (\ln BM/\ln dcp, \ln dbd, \ln fdv, \ln re, \ln to, \ln npl)$	2.334	No
$F(\ln dcp) = (\ln dcp/\ln BM, \ln dbd, \ln fdv, \ln re, \ln to, \ln npl)$	9.401	Yes
$F(\ln dbd) = (\ln dbd/\ln BM, \ln dcp, \ln fdv, \ln re, \ln to, \ln npl)$	1.471	No
$F(\ln fdv) = (\ln fdv/\ln BM, \ln dbd, \ln dcp, \ln re, \ln to, \ln npl)$	8.197	Yes
$F(\ln re) = (\ln re/\ln dcp, \ln dbd, \ln fdv, \ln BM, \ln to, \ln npl)$	2.862	No
$F(\ln to) = (\ln to/\ln dcp, \ln dbd, \ln fdv, \ln re, \ln BM, \ln npl)$	1.617	No
At 5% significance level, upper value 3.28 and lower value 2.27		

Note 1: Right hand side of all the equations represents as (ln dependent variable/ln of all other independent variables separately); **Note 2:** FDV for financial volatility, BM for broad money, DBD for domestic credit by financial sectors, DCP for domestic credit to private sectors, NPL for non-performing loan, RE for remittance inflow, TO for trade openness; **Note 3:** 3 digits have been considered after decimal

Next, it is needed to select the lag length to identify which coefficient will be selected for the estimation of the result. Table 3 represents the lag length order of the variables. Results of SIC indicate that NPL, DBD, DCP, and BM should include in the model at 0 lag, which means the coefficient at 0 lag will be considered for estimation. In addition, FDV and RE should include at the lag 2 and TO should be in the first lag.

Table 13: Lag Selection Criterion Test Result

Lag length selection by Schwarz Information Criterion (SIC)					
Variables	Lags				
	0	1	2	3	Selected Lag
NPL	5.536	5.405	5.421	5.390	0
BM	2.837	2.390	2.397	2.252	0
DBD	3.408	2.974	2.963	2.683	0

DCP	2.537	1.962	1.826	1.037	0
FDV	1.663	1.609	1.928	1.827	2
RE	2.646	2.545	2.662	1.937	2
TO	6.480	6.518	5.711	5.351	1

Note 1: 3 digits have been considered after decimal; **Note 2:** FDV for financial volatility, BM for broad money, DBD for domestic credit by financial sectors, DCP for domestic credit to private sectors, NPL for non-performing loan, RE for remittance inflow, TO for trade openness

4.3 Long Run ARDL Test

After getting the evidence of having a long-run relationship among the variables, now the main ARDL test has been conducted to estimate the long-run and short-run relationship with the NPL and other independent variables separately. Looking into the long run outcomes from Table 14 (Panel A)- the coefficient of BM at 0lag is 9.632 indicates the positive relationship with NPL; which is found to be similar to the findings of (Morakinyo and Sibanda 2016) and dissimilar with (Poudel 2013). That is, in the long run, a 1% increase in BM will push the NPL to rise by 9.632%; which proves the most significant and positive impact on non-performing loans in Bangladesh. The fact is, when the money supply increases, NPL will be found to respond positively. In detail, when people have more money in their hands, they will save some amount along with the spending. That's how banks can have huge deposits. As deposits are useless if loans are not given to the investors, banks try to influence the investors to take loans at a very lower interest. NPL will suppose to increase because of the increased amount of loans. Here, political influences may be considered as the relationship should be positive. There is an increased amount of broad money in the economy means people have an adequate amount of money in their hands. So the situation of non-repayment of loans shouldn't have arisen. By showing strong political power, investors may deny paying the loans. Again the questions arise on the management policy of the banks. Because, if enough investigations on the investors' profile are made before giving loans, non-payment of loans wouldn't exist.

Except for BM, the rest of the variables are negatively related to NPL, which is a 1% increment of variables that tend to decrease the NPL level at a particular percentage and vice versa. Starting from DBD, where the coefficient is -6.32, it describes a strong negative relationship with NPL. More descriptively, 1%decrease in DBD causes the NPL to increase by 6.32%. Domestic credit by the financial sector enables the households, business groups, and government as well to invest in further productive sectors with less or in some cases no interest. In addition, taking loans from other sources with high-interest rates decreases, These domestic credits can help to establish a sustainable financial condition of the businesses. By selling account receivables, security purchasing and taking loans and trade credits, the business groups can generate adequate cash flow and it becomes easy to repay the credits, thus the NPL tends to decrease. In Bangladesh, DBD is a strong negative influencer of NPL in the long run, as NPL responses 6times more adversely with the movement of DBD. Thus, the result is similar to what was expected.

Secondly, the coefficient of DCP at 0Lag is -5.98, which is totally opposite findings of (Akinlo and Emmanuel 2014, CLICHICI44 and COLESNICOVA45 2014, Beaton and Myrvoda 2016, Kjosevski and Petkovski 2017). That means in the long run, if DCP decreases by 1%, it will affect the NPL to be increased by 5.98%. Domestic credit to the private sector is the same as the DBD, but the government is excluded from here. Like the DBD, DCP is found to be strongly related to the NPL; that is NPL will respond negatively at almost 6times more with the movement of DCP. Thus, the expected result has been found.

While considering Lag 2 for FDV and RE, negative relationships are found further among the variables. The coefficient of FDV at Lag 2 is -7. 91, which expresses the highest negative relationship with NPL. More specifically, in the long run, non-performing loans in Bangladesh will increase 7.91% with the 1% reduction of the FDV and vice versa. Because of our extremely volatile stock market, NPL has been effected a lot. The coefficient value exposes a strong negative effect. Frequent fluctuations in stock prices demotivate the investors to invest in the stock market. As investors tend to reduce investment in the stock market, they will prefer not to take loans from banks and NPL

decreases with a decreased amount of loans. More clearly, in the long run, NPL responds negatively at almost 8times more with the change in FDV in Bangladesh.

The coefficients of RE and TO are -2.91 and -0.35 respectively, which also clearly expose the negative relationship with NPL; which also agrees with the findings of (CLICHICI44 and COLESNICOVA45 2014, Turan and Koskija 2014). Here the noticeable fact is, though TO has a negative relationship with NPL, it is least significant compared to the others. The coefficient of TO is -0.35, which also describes that a 1% increment or decrement of TO will either decrease or increase the NPL respectively by 0.35% in the long run. The Trade Openness variable exposes the amount of international trade of a particular country considering total exports and imports. As the coefficient is very low but negative, it can be described that, when the export-import level becomes higher, banks may have more capital and may have the capacity to reduce the default loans. However, as the effect is very slight, it can be considered insignificant.

The negative coefficient value of RE also describes an adverse relationship with NPL. According to the value, in Bangladesh, NPL responses negatively at almost 3times more with the movement of remittance inflow. On the other way, a 1% increment of remittance inflow will decrease the NPL of Bangladesh by 2.91% in the long run. The real fact is that, when people have more money because of receiving remittances, they will tend to take fewer loans from banks and NPL decreases with a decreased amount of loans.

So, the outcome of the long run estimation of coefficients of the variables says that BM creates a positive and most significant influence on NPL. On the other hand, FDV affects the NPL most negatively.

4.4 Short Run ARDL Test

After finding the outcome of a long-run relationship among the dependent variable (NPL) and all the other independent variables, next is to estimate the short-run relationship among the variables. The results from Table 14 (Panel B) express that only BM has a positive and significant influence on NPL and other variables create a negative influence (similar to long-run findings). The coefficient value of BM is 1.96, which is quite

smaller than the long-run value. Thus, it indicates that the influence of the BM on NPL in the short run is less strong than in the long run. By 1% increment of BM pushes the NPL to increase by 1.96% and vice versa. Because of the increment of broad money in the economy of Bangladesh, banks can have huge deposits. Banks may attract the investors to take loans at a lower interest rate and thus the loan amount increases. This is how NPL also increases, however, NPL responses quite less in the short run; that is because of the movement of broad money, NPL changes almost 2times more negatively.

While looking into the DBD and DCP, it is also visible that, the coefficient values are comparatively lower than the long-run values; which proves that a little effect exists in the short run. The coefficient values at the selected lags of the two variables are -1.29 and -1.22 respectively, which are also clearly exposing that the relationships are negative. That is, per 1% increment or decrement of the coefficient values will tend to decrease or increase the NPL in the short run. In detail, though domestic credits are often attractive to households, business groups and government as well, in the short run domestic credits effect the NPL in a slight negatively compared to the long-run effects.

Next, it is necessary as well to see how financial volatility (FDV) influences the NPL in the short run. The coefficient value of FDV is -4.86, which means, if FDV increases or decreases by 1%, then it will adversely affect the NPL to be decreased or increased by 4.86%. Compared to the effects of all the variables, in the short run financial volatility creates a strong negative impact on NPL, which also proves how volatile the stock market of Bangladesh is. In a very short period of time, too many fluctuations in stock prices push the NPL to decrease. NPL responses adversely at almost 5times more with the changes of FDV in the short run in Bangladesh.

Then, the next variable is RE, in which the coefficient value is -1.79 indicates a negative influence on NPL in the short run, which is also less than the long-run effects. Same as the long run, the effect of TO on NPL is too smaller than the effects of other variables described before. The coefficient value of TO in the short run is -0.13, which is also lower than the long-run coefficient value of TO by 0.22. As a 1% increase of TO tends to decrease the NPL by 0.13%, so the effect is too little and thus similar in the long run, an insignificant relationship is found between TO and NPL.

The concluding fact is that the effects of all the independent variables on the dependent variable in the short run are quite lower than in the long run. Like the long-run outcomes, in the short run, BM is the positive most and also a significant indicator of NPL compared to the others. In detail, when BM (a measure of the money supply) increases in the economy, banks will have more money to provide loans and the increased amount of loans pushes the non-performing loans to rise. Besides, FDV is found to be the most significant negative influencer of NPL in both long run and short run. It can be explained in such a way that, a huge number of people use to invest in the stock market with the support of bank loans. When financial volatility (fluctuation in stock prices) is more, people will prefer not to invest in the stock market because of the heavy risk of becoming a loser. When they won't invest in the stock market, certainly they will take fewer loans from the bank and these lower amounts of loans tend to decrease the non-performing loans.

After conducting the co-integration test, Vector Error Correction should be done in order to find out the short-term dynamics in the long-run equilibrium relationship. Considering lag 1 for the error correction term (ECT), it is found to be insignificant and negative. The coefficient value of ECT is -0.38, which means the speed of adjustment is slow.

4.5 Residual Test

For the OLS test, lag 1 has been considered as a standard one and this lag 1 will be considered as the foundation of all the results of these OLS tests except for one test.

At first, R^2 refers to the coefficient of correlation that measures the strength of the linear relationship between two variables. On the other hand, adjusted R^2 is suitable in the case of multiple independent variables. As this study includes six independent variables, so this study is focused on adjusted R^2. Table 14 (Panel C) provides that value of adjusted R^2 equal to 0.958, which refers that non-performing loans can be explained by 0.958 or 95.8%by all six independent variables. In other words, these six independent variables are 95.8% responsible for the movement of non-performing loans. Firm-specific factors or other macro-economic reasons are 4.2% responsible for the change of NPL.

F squared statistics measures the effect size that refers to the strength between two variables especially for using the multiple regression analysis methods. This study has evaluated the Cohen's F^2 statistics which refers to that if the value of F^2 is more than 0.35, then there is a large effect size between two variables. In this study, the value of F^2 statistics is almost 68.66, which is undoubtedly larger than 0.35. So it suggests that there is a strong relationship between the dependent and all independent variables separately.

Autocorrelation or serial correlation refers to the correlation of a variable with itself with subsequent observations. The presence of serial correlation in multiple regression is a serious issue for perfect estimation. Because the error of one observation of a given time period is shifted to the next observation considering the future time period. So determining whether the time series has serial correlation or not, is a vital issue for multiple regression analysis. In this study, the value of the serial correlation of this time series is 3.004 which refers that there is a very strong positive serial correlation among the different observations of variables. So observations cannot be considered as independent.

RESET test is conducted for determining the different types of specification errors such as the absence of any relevant independent variable and incorrect functional form. In this study, it has been tried to find out whether any relevant variable has been omitted or not and for that, the null hypothesis has been made indicating no omitting of the relevant variable. Here, the value of F statistics (0.911) is more than the significance level of 0.05 which indicates the acceptance of the null hypothesis. So it refers to that no relevant variable has been omitted for conducting this study.

So, like the ARDL test, the seven findings of the OLS study ensures the robustness of the relationship between non-performing loans and the other six macroeconomic factors.

Table 14: ARDL and Residual Test Result

ARDL Test				
Panel A: Long-run Method Estimation				
Variables	**Regressors (Lag)**			
	0	**1**	**2**	**3**
BM	**9.632** [1.032]	4.668 [1.485]	5.544 ** [2.751]	4.053 ** [2.834]
DBD	**-6.316** [-1.085]	-2.481 [-1.356]	-4.173 ** [-2.745]	-3.136 ** [-2.888]
DCP	**-5.982** [-0.990]	-3.413 [-1.521]	-2.720 ** [-2.212]	-1.978 ** [-2.293]
FDV	-10.152 [-1.191]	-7.312 [-1.441]	**-7.910 **** [-2.352]	-8.103 *** [-3.272]
RE	-3.031 [-1.222]	-3.637 ** [-2.708]	**-2.907 ***** [-2.973]	-2.322 *** [-3.128]
TO	-0.445 [-1.069]	**-0.350 *** [-1.935]	-0.310 *** [-2.953]	-0.275 *** [-3.800]
Panel B: Short-run Model Estimation				
Variables	**0**	**1**	**2**	**3**
ECT_{t-1}	-0.204 *** [-4.816]	-**0.384** *** [-6.389]	-0.614 *** [-8.034]	-0.819 *** [-8.360]
$\Delta NPL(-1)$	**-0.204** [-1.409]	-0.384 ** [-2.617]	-0.615 *** [-4.116]	-0.819 *** [-4.448]

ΔBM	**1.960 **** [2.551]	1.792 ** [2.542]	3.409 *** [3.852]	3.318 *** [3.937]
ΔDBD	**-1.285 **** [-2.456]	-0.953 * [-2.031]	-2.566 *** [-3.728]	-2.567 *** [-3.914]
ΔDCP	**-1.217 **** [-2.266]	-1.311 ** [-2.553]	-1.673 ** [-2.798]	-1.619 ** [-2.850]
ΔFDV	-2.066 * [-1.763]	-2.808 [-1.467]	**-4.864 **** [-2.196]	-6.634 ** [-2.893]
ΔRE	-0.617 [-1.401]	-1.397 *** [-3.079]	**-1.788 **** [-2.526]	-1.901 ** [-2.670]
ΔTO	-0.091 [-1.542]	**-0.134 **** [-2.548]	-0.191 *** [-3.832]	-0.225 *** [-4.337]
Panel C: Residual Test				
R^2	0.955	**0.972**	0.986	0.987
Adjusted R^2	0.941	**0.958**	0.967	0.973
δ	2.891	**2.444**	2.160	1.964
$F^2_{statistics}$	66.285 ***	**68.664 *****	51.644 ***	69.840 ***
$x^2_{Autocorrelation}$	2.882 *	**3.004 ***	3.508 *	9.238 ***
$x^2_{Heteroskedasticity}$	0.484	**0.627**	2.024 *	1.514
$x^2_{Normality}$	12.542 ***	**31.038 *****	7.647 **	18.677 ***
x^2_{RESET}	2.404	**0.911**	0.260	0.448

Note 1: FDV for financial volatility, BM for broad money, DBD for domestic credit by financial sectors, DCP for domestic credit to private sectors, NPL for non-performing loan, RE for remittance inflow, TO for trade openness; **Note 2**: Δ represents short run; **Note 3**: *** indicates significance at 1% level, ** indicates significance at 5% level, * indicates significance at 10% level; **Note 4**: Coefficient value without any * mark indicates significance at more than 10% level**; Note 5**: 3 digits have been taken after decimal; **Note 6:** δ represents standard error of regression, R^2 for coefficient of Determination; **Note 7:** Bold values are considerable value based on selected lag; **Note 8:** Values without any bracket represents coefficient value for ARDL test and value under third bracket represents value of t statistics; **Note 9:** NPL is dependent variable and others are independent variables

CHAPTER V: DISCUSSION

5.1 Conclusion

Introduction:

Being a developing country in South Asia, Bangladesh is retaining a better socio-economic growth (compared to the years before the 1990s). The most awaited phenomenon for the government and the residents of Bangladesh is to become a developed one within the next 21years. As economic development is the foundation of the overall country development, thus it is crucial to ascertain a sustainable strength of the financial sector. For strengthening, it's important to identify which factors restrict the profitability of the banks and non-bank financial institutions; thus the matter of non-performing loans arises, which is the most mooted topic nowadays. Both internal and external economic factors might be found as responsible for the increasing level of NPLs, which is reached at 12% in September 2019. This study centers on just a few external factors for which non-performing loans respond most. Compared to the non-bank financial institutions, banks hold a huge percentage of non-performing loans, which ultimately becomes a great burden and it hurts the profitability of the banks by creating a negative impact on the capital. This research is conducted based on the data from 1972 to 2017 to get more reliable findings related to the movement of NPLs.

Objective:

This study focuses on macroeconomic factors, which affect the level of non-performing loans. The objective of the study is to determine among the six macro fundamental factors, which factors affect the non-performing loans most.

Methodology:

In this study, seven variables have been used including a dependent variable- Nonperforming loans and six independent macro-economic variables- Broad Money, Domestic credit By financial sector, Domestic Credit to Private sector, Financial Volatility, Remittance, and Trade Openness. To form the analysis, the ARDL model was used to

determine the positive or negative effect of the independent variable on the dependent variable in both the long run and short run; where Error Correction Model (ECM) was used to estimate the short-run relationship among the required variables. For the stationarity test, a unit root test was conducted including ADF, PP, and KPSS. In addition, to determine the strength of the relationship between the variables, OLS regression analysis was conducted.

Findings:

According to the result of the unit root test (ADF and PP), stationarity is found among all the variables in the first difference (Δ), which indicates the consistency of the time series variables. However, according to the KPSS test, the unit root is found in the first difference (Δ)in BM and FDV, because of having higher LM statistics than the required critical value (0.463), which indicates that broad money and financial volatility often fluctuates more and inconsistency exist in the values.

Linear ARDL Bound Test was formulated to identify the existence of a long-run relationship among the variables. Considering NPL as a dependent variable, a strong co-integration was found among all the seven variables as F- Statistics (3.911) was higher than the upper bound critical value. Thus, a long-run relationship was found among the variables.

The findings of ARDL expose that, in the both long run and short run, BM is most significant and positively related to the NPL, similar as the findings of (Morakinyo and Sibanda 2016) and dissimilar with (Poudel 2013)because of having larger coefficients-9.632(long run) and 1.96 (short-run). It indicates that, when the money supply increases, non-performing loans will move upward. Most interestingly, except for the BM, the rest of the variables create a negative impact on NPLs; out of which FDV is found to be the most significant negative influencer because of the largest negative coefficients, -7.91 (long run) and -4.86 (short-run). It reveals that NPLs will tend to decrease with the more fluctuation of the stock prices.

Moreover, the coefficients of DBD are; -6.32 (long run) and -1.29 (short run), which express a stronger negative relationship with the NPLs. In detail, NPLs will reduce when

financial sectors provide more domestic credit. Similarly, DCP was also found to be negatively related to NPLs, which is the just opposite findings of (Akinlo and Emmanuel 2014, CLICHICI44 and COLESNICOVA45 2014, Turan and Koskija 2014). That means, when more domestic credits are provided to the private sector, NPLs will tend to decrease. The negative relationship was also found between RE and NPLs similar to (CLICHICI44 and COLESNICOVA45 2014, Turan and Koskija 2014), which means when remittance inflow is more, the general people will prefer to use it, rather than taking loans, which ultimately reduces NPLs. The effect of TO on NPL was found to be insignificant compared to the other variables, because of having the lowest but negative coefficients in both long run and short run; -0.35 (long run) and -0.13 (short-run).

According to the residual test, the findings say that these six independent variables are 95.8% responsible for the movement of non-performing loans, which ensures the most reliable outcome.

Real-life implications:

The outcome of this study can be very helpful for Govt., financial institutions and investors also. This study reveals a positive relationship between NPL and BM which indicates that an increase in the money supply by Govt. in the economy will increase the NPL. Now it is obvious that the increased amount of NPL directly hampers the performance and profitability of financial institutions. Thus, businesses will not be able to take sufficient loans from the FIs which will hamper the growth of the business. So this study result can help the Govt. to understand that the money supply should not cross a particular amount for a fiscal year which will increase the NPL. Though the increased amount of money supply seems good for the economy, ultimately NPL responds adversely a few times more with the movement of broad money. It is simply that when people have more money, they can repay the loans easily; however, the result says something opposite. Political factors may have a great impact on the level of NPL, thus government can impose strict rules (which should be followed by the banks and other financial institutions) of investigating the profile of the borrowers before providing loans.

Again, this study exposes a negative relationship between DCP and NPL and also between DBD and NPL. It means that a decreased amount of domestic credit by financial sectors will increase the non-performing loan which will ultimately negatively affect the financial institutions. So similar to Govt, this study result can help the financial institutions to understand that the amount of domestic credit should not fall down a particular level for which the NPL will increase. Again, this study result can help the investors as well.

According to the study result, an increased amount of remittance and export-import value will decrease the NPL because people will start to take fewer loans from FIs. So Financial institutions may start providing the loan with less interest. Now, different businesses can take this opportunity and take a huge amount of loans with less interest. It will be possible only if they have the knowledge of the relationship of NPL and these factors that have been found in this study.

5.2 Suggestions for Future Research

Since it has already been mentioned that this study is based on six major macro fundamental factors. However, there are other macro variables as well as non-economic factors. Again, firm-specific factors also influence the non-performing loan of financial institutions. So future research consisting of both economic, non-economic and firm-specific factors will give a reliable and accurate result for the purpose of the growth of the economy which may not be suffered by NPL.

According to this study, a strong positive relationship was found out between broad money (an indicator of the money supply) and NPL, which seems like just the opposite findings of several studies. NPL should respond negatively with the increment of broad money, so further research can be made on how broad money effects the NPL positively and which factors are involved in between broad money and NPL to create positive relationships.

Another fact is, a strong negative relationship has been found between financial volatility and NPL. But, no studies have been found regarding the relationships of these two factors. Stock price movement has become a common issue for Bangladesh. Further studies can be conducted to identify how the stock price movement affects the NPL negatively.

Again, this study has been carried out by using the OLS based ARDL model. However, there is an updated version of the ARDL model named the Non-Linear ARDL model. Conducting future research by including this non-linear ARDL with the traditional ARDL model will give more reliable results regarding the factors that affect non-performing loans of Bangladesh.

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