

**CAPITAL UNIVERSITY OF SCIENCE AND
TECHNOLOGY, ISLAMABAD**



**CONSIDERING BUSINESS CYCLE EFFECT:
DETERMINANTS OF NON-PERFORMING LOAN,
THE EXPERIENCE FROM SOUTH ASIA**

by

Mir Zat Ullah

A thesis submitted in partial fulfillment for the
degree of Master of Science

in the

**Faculty of Management & Social Sciences
Department of Management Sciences**

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*Dedicated to my parents and supervisor for their never-ending
support and their guidance*



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CERTIFICATE OF APPROVAL

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Abstract

The study explores the determinants of non-performing loans (NPLs) in banking sector of emerging south Asian countries. We employed both static and dynamic estimation methods for the empirical analysis over the period 10 years from 2006 to 2015. The study includes both bank-specific and macroeconomic variables with an additional business cycle variable. The result shows that bank specific variables such as Return on Assets (ROA) and Return of Equity (ROE) are significant and negatively related to NPLs. In addition, we found that the country specific variables such as unemployment rate, economic growth and fiscal budgets are significant determinants of NPLs. Furthermore, the additional variable output gap used for economic downturn is found to be an important driver of NPLs.

Keywords: Non-performing loans; Bank-specific variables; Country-specific variables; South Asia

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Chapter 1

Introduction

1.1 Background of the Study

Historically the incident of banking crises is extremely related with the massive accumulation of non-performing loans (NPLs). It is because that NPLs can account for the sizeable share of total assets of insolvent financial institutions especially the banks. More precisely, NPLs increased during global financial crises of 2007-08. Historically, the perceptible association among banking crises and NPLs was further corroborate in 1930, 1997 and recently in 2007-08 crisis. The crisis of 2007-2008, is known as global financial and banking crisis. In previous studies many economists considered these crisis as the worlds worst financial crisis since the Great Depression of the 1930s (Dimitrios et al., 2016; ?; ?). As Park and Zhang, (2012) concluded the result of the crisis for banking sector of south Asia the crisis was nonetheless followed by a global economic downturn and the great recession.

These crises affect the business cycle of almost of every economy, with more than threefold increase in the volume of NPLs(Messai and Jouini, 2013).As a result of these crisis over six banks of India, followed by five banks of Pakistan and three banks of Bangladesh collapsed. Similarly, over hundreds of merger and acquisition cases exercised. According to global financial stability survey by IMF represents NPLs are more than 30 percent of the total loan portfolios(Chaibi and Ftiti, 2015).

The banking crisis had a great impact on South Asia, as well as, European and Middle Eastern countries are also affected. However, Both European and Middle East banking sectors accompanied by a rapid accumulation of NPLs(Abid et al., 2014).

The present study explore the challenges faced by banking sector of South Asian emerging economies like India, Bangladesh and Pakistan regarding to NPLs. The banking system plays an important role for any country economic development. The banks manage the credit flows from surplus to deficit and also play a significant role to enhance of investment efficiency of the economy. When a bank provides a loan to the borrower, then, , it call a lot of risks like liquidity risk, credit risk, operational and market risk etc... Similarly, every bank analyze and measure all the factors of lending and borrowing and the risks associated with them, because, it would lead bank toward the bankruptcy, as, it is considered one of the signal of banks failure (Kauko, 2012).Generally the NPLs refer as a loans that are relatively for a extended period of time and does not make income for bank, also, where, the loan principal amount or accumulated interest remain unpaid for at least three months (Arellano and Bond, 1991).

Another words, NPLs can be define as, the loan in which borrower fail to pay interest and/or principal amount for at least three months period (Reddy, 2003). The criteria for identifying NPLs are different across different banking system and economies. The definition of NPLs used in the present study is based on a minimum time of problematic loan that do not make any profit for bank from last several months.

In some cases the loan actually not occurs into NPLs but it gives a signal to be default. Banks makes changes in existing policies according to loan and converts it into bad loan. All the terms and conditions are mentioned and defined in the policy book of banks when to convert loan into NPLs account. After the process, if any loan found to be default than banks shift it into NPLs account(Bacha, 1990). Therefore, as NPLs level exceeds it put pressure on bank financial statement and prevent the bank from their intermediating role and it would further creat difficulties in the process of economic growth. It means, that bank require to

make strict policies regarding approval of loan. According to (Boudriga, Boulila Taktak, and Jellouli, 2009) the main reason behind the banks failures are the asset quality deterioration in the banks.

The insolvency in financial institutions is also one of the main problems in several countries. Actually, the problems of banks insolvency is the increasing ratio of NPLs, which increase pressure on bank management to avoid generating new loans, additionally, the NPLs deteriorate the economic growth of the economy (Dimitrios et al., 2016). Therefore, considering the determinants of NPLs are major interests for policies maker in order to address bad debt ratio in the banks. The factors responsible for growing NPLs are both internal bank specific variables as well as external country specific macroeconomics variables.

After the of 2007-08 financial crisis as explained earlier, the banking systems across several emerging economies were resilient to the global downturn even economic with stable growth IMF it is reported that overall level of NPLs exceeds from the expected level in that decades (Global Financial Stability Report, 2009). Different methods used to measure the banking performance across the developing world. However, the relationship between loan portfolio performance and the business cycle directly affect GDP of a country and create domestic crises. By such declines in GDP most developing countries faces the indirect effects of global recession rather than a domestic crisis (Fofack, 2005). In some economies the importance of effective institutional frame works reflecting past reforms and the lessons learned from past crisis episodes. . The current study empirically examines the business cycle effect in context of NPLs for the emerging economies of South Asian countries. The reason for studying such variables is that, where economies of India, Bangladesh and Pakistan are mostly effect from external changes of financial market (Kauko, 2012) as earlier discussed in financial market crises. After 2006 the stock markets of South Asia countries more effect from US war against terrorism especially the economy of Pakistan. So the current study is using the effects of business cycle in context of NPLs.

After the recent global financial crisis, that started from United State and spread across the world. The situations were worsening in the countries where the banks faced insolvency and record highest level of NPLs. The massive increase in the amount of NPLs attracts the attention of policy maker to examine it. The ratio of NPLs is important measure banks performance i.e. the profitability. Additionally, at state level considering NPLs is more important to examin financial mobilization, economic activates, and liquidity of current assets for any economy.

1.2 Supporting Theory

1.2.1 Theory of financial intermediary

The theory of financial intermediaries is first time developed by (Allon and Santomor1991). This theory describes that there is significant relationship between bank management, financial activities, government taxes and capital market imperfections. The firm must be balanced, therefore, it is an important aspect aspect to review trading and risk avoiding techniques at the time of negotiation of loans and approvals of new loans. The theory used in several empirical studies (Espinosa and Prasad, 2010; Tanasković and Jandrić, 2015) in the context of NPLs for instance. Different studies discussed some factors such as the management expertise, ration of different taxes, capital market liquidity and cost of financial distress they influence the health of loan (Arellano and Bond, 1991; Chaibi and Ftiti, 2015; Dimitrios et al., 2016). The banks should consider these indicators before to set the policy regarding loan and recovery, in a way that can maximize the shareholders equity.

The financial institution facilitates the function of financial intermediary that primary objective is to channelize funds between lenders and borrowers indirectly with trust of returns. The financial world changed by adopting financial liberalization. Traditional and manual approaches converting into financial markets with new problems such as NPLs faced to the banks (Chen, 2009). The theory of financial intermediation consists on organizational asymmetric information

and transaction cost and management behavioral approach. Berger and Deyoung, (1997) concluded banking business is based on theory of financial intermediation, where, banks are liable to provide facility of lending and borrowing with making insurance of funds.

New market like financial futures, options and swaps are the markets that totally deals with help of some financial intermediaries. The facility of financial intermediation provided by any sound financial institute mostly the banks (Suzuki et al., 2008). The role of financial intermediation the risk trading and participate costs with respect to NPLs. (Laeven, L., Ratnovski, L., and Tong, 2014) examined the US financial market and concluded that risk is more important when to avoid the cost of transaction. Further, they explained that intermediaries have still important role to control the increasing rate of NPLs.

1.3 Problem statement

It is important to evaluate the determinants of non-performing loans at micro and macroeconomic level of the banking sector. The study focuses to examine the emerging economies of South Asia. Where the ratio of NPLs increasing in banking sector of South Asia. Therefore, it is pertinent to examine the determinants of NPLs, in particular, how NPLs could be explained in economic upturns and downturns. The financial conditions of the south Asian markets are quite different from other developed markets. For instance, the stagnant growth, weak recording system of revenue, low taxable income with unfair financial reporting and access to actual financial data. The present study intend to examine three developing economies Bangladesh, India and Pakistan with introducing additional variables of business cycle effect and income tax rate as percentage of GDP that stems from the empirical literature, such as Chaibi and Ftiti, (2015) determine for France and Germany and Dimitrios et al., (2016) studied for European banks.

1.4 Research gap

For the South Asian economies several empirical studies have been conducted on to examine the NPLs. However, some studies have conducted with focusing only bank specific variable and for the single economy.

The current study used panel data set to examining the three emerging economies India, Bangladesh and Pakistan by evaluating both bank specific and country level variables with more the 100 banks with 800 cross sections of high medium and low size of banks. Additionally, the study is contributing two new variable empirically in literature for the first time, that are the output gap with effect of business cycle and role of income tax on personal income as a percentage to GDP that are not measured in earlier empirical studies.

Secondly, both state level and bank level variables are used together in the model. The intuition of these variables in relationship with NPLs are: when household pay more income tax their disposable income would decrease and more likely they may be unable to payback their loan to the bank. The proxy of output gap used to measure effect of business cycle. Output gap measures the ups and downs in the economy, computed using Hodrik and Prescott filter (Dimitrios et al., 2016).

1.5 Research questions

This research aim is to pose the following empirical questions

1. What are the important drivers of NPLs on the banking sector of South Asia?
2. Do NPLs have been affected due to economic fluctuations in the major South Asian economies?
3. Is change in macroeconomic variable really effect the ratio of bank NPLs?
4. How any change in income tax rate effect banking efficiency? In case of an increase in income tax rate how it effect the ratio of NPLs?

1.6 Objective of the Study

1. The key objective of study is to explain the macroeconomics variables as well as bank specific factors that affect non-performing loan in the banking sector.
2. Next, the study employed additional indicators, such as, considering business cycle effect and income tax rate whether it influence the non-performing loans (NPLs).

1.7 Significant of the study

The main source of earning for financial institutions are credit facilitations and when these assets for the banks (loans) are not performing well, than it creates risk in form of NPLs (Abid et al., 2014). Therefore, it is necessary to identify and explore such drivers that can cause the non-performing loan. Thus, an effort is to empirically conduct the study that examining the macroeconomic and microeconomic variable in context of any changes in NPLs. The study in particular will assist the institute that handles credit risk. Hence, to design better framework and policies for risk management to make any changes in macroeconomic variables. In addition, this study can be used for future prospective to financial institution for the purpose of loaning and credit sanctioning to businesses and commercial sectors.

1.8 Plan of the study

The rest of the thesis is organized as follows. The chapter 2 discusses the existing literature and their results. The chapter 3 consists the collection of data and research methodology. While, chapter 4 comprises the empirical results and discussion of the study. Finally the chapter 5 discusses the conclusion and policy implications.

Chapter 2

Review of Literature

2.1 Non-Performing Loan

In recent past, the interest regarding non-performing loans NPLs and its determinants have been increased. The study examined more latest financial data of both bank and country level. Numbers of studies have been conducted on NPL with several dimensions. The empirical evidences of the studies reveal the valuable insights about the quality of loan portfolios and its impact on states of banks.

Non-performing loan is a widely accepted approach in the literature and become a Wall Street phenomenon in financial economics. There exist a significant relationship among microeconomic (bank specific) and macroeconomic factors and non-performing loan according to many studies.

The non-performing loan is a type of loan where borrower fails to pay the principal amount of the loan or interest due with the loan. The Non-performing loan according to literature has an impact on bank performance and its outcomes. It is to be considered as the main factor of banking failure ([Arellano and Bond, 1991](#)). The failure may be in form of inefficiency or increasing level of bad loans. , which are the state level and bank level variables. De Young and Berger (1997) examined management related hypotheses by using Granger and causality test. They conclude the link among quality of loan quality, profitability and capital cost and

derived that moral hazard and the bad management hypotheses are the important driver of non-performing loans.

Weill and Podpiera (2006) examined the ratio of NPLs sign of bad-management and cost efficiency by using the causality test. They reveal that increasing in amount of NPLs effect earnings of banks. While Ghosh (2008) examined 20 commercial banks of India concluded that that NPLs effect the lagged leverage for upcoming year amount of NPLs. Prasad and Espinoza (2010) studied major state level variables like unemployment rate, GDP growth and interest rate variables by using impulse response technique. However, they reveal that NPLs declines with GDP growth of economy and arise with increase in interest rates. Moreover, they explain that deficit fiscal and external deficits enhance NPLs.

More recent literature highlights the impact of non performing loan on profitability of banks. (Louzis et al., 2010) estimated separately for each loan i.e. consumer loan business laon and mortgage loan. Their results show that level of NPLs are linked with the nature of loan and consurn with credit rating of borrower. Furthermore, they conclude that, in mortgage loans have more chances of NPLs as comparison with business and consumer loan. According to (Nkusu, 2011) bank performance are linked with level of NPLs.

In the current study it is tried to explore the determinants of NPLs in banking sector of India Pakistan and Bangladesh. These economies change rapidly with change in macroeconomic conditions. These changes may be the externally or internally in the economy like interest rate, unemployment and inflation as well. All these factors have great influence to change the amount of NPLs (Gerlach and Yiu, 2004).

By analysing past literature the study introduces two important variables that stem from the academic literature. The study examines the model to check their explanatory power. These are the output gap with effect of business cycle and role of income tax on personal income as a percentage to GDP that are not measured in earlier empirical studies. Where, an individual borrower pays more income tax then his disposable income will be reduced. Similarly, the capacity to pay back loan to the bank has effect.

The output gap is used to measure the difference between potential output and actual output of economy (Gerlach and Wensheng, 2006). The output gap may be negative and positive, to measure the business cycle the study use output gap as proxy. Output gap is expected to affect NPLs positively. The banking sectors of both developed and developing economies faced the increasing problem of NPLs (D. a Grigorian and Swedberg, 2006).

However, NPLs can be increase with change in state level variables such as return on asset (ROA) and return on equity (ROE) that explain the profitability of banks. Hayati Ahmad and Ariff (2007) concluded that if profitability of bank increases the bank do not generate risky loans. They examined 23 different sizes of commercial bakes of India for the period ending 2006.

In recent era the policy maker get more interest to evaluate the determinants of bad loans. The main reason is that the bad loans convert profit into loss that is worst then the loss of business transaction. The current study evaluates the banking sector. We investigated the bank level data as well as the country specific data.

On non performing loan there are many studies have been conducted with different scope. It is been revealed in the empirical evidences of several studies the important insights regarding non portfolios quality and its impact on states of banks. The non performance load affects almost every financial market and becomes a well known phenomenon in financial world.

The Microeconomic and macroeconomic factors and NPL having significant relationships according to several studies. According to different researchers non performing load has an impact on bank performance and its results (). Incapable and growing level of bad loans is some of the forms of banks failure. The entrepreneur and state level are main factors which increase ratio of NPL.

() suggested that the role of management has great impact in controlling the level of NPL. They used Granger and causality test for the US banking sector using 15years data from 2001 to 2016. Furthermore they revealed that good management practices can control the increasing ratio of bad loans. The same study conducted

by () and tested the level of non performing loans sign of bad management and cost effectiveness by using the GMM test.

They analyzed the GCC banking system by using 10years data from 1991 to 2000. They also suggested that escalation in amount of non-performing loans effects earning of banks. Moreover () tested 35 Chinese commercial banks resulted that non performing loans effects the profitability of banks. They also evaluated the ratio of return on equity and return on assets, cost of capital and cost of debt. ROE and ROA have positive relationships with increasing non performing loan.

Additionally, different studies focus on state level variables with a single factor that effecting level of NPLs, with examining a single bank related variable. However, the current study include major important state level and banking industry level variables In addition the study examined some new variables streaming from empirical literature.

Moreover, the state level variable include such as economic size, unemployment rate, government budget (deficit/surplus), income tax as a percentage of GDP, public debt as percentage of GDP, inflation rate, and output gap. All these variables have a significant impact in empirical literature. The macroeconomic variable are effect the economy of the specific country (Sufian, 2009).

2.1.1 Banking Industry Specific Determinants of NPLs

Recently, the literature about increasing role of non-performing loans (NPLs) has taken more interest for policy makers. Major changes in economy came due to increase in amount of NPLs. These changes are due to two factors, it may be systematic change for economy like macroeconomic changes and secondly it may be the microeconomic change. (Espinoza and Prasad, 2010) proposes that NPLs attract the attention to examine the variables liable to the financial vulnerability in banking sector.

They study the performance of 80 banks of GCC countries and evaluated the NPL with investor perception about the banks performance. They further analyze

different bank level factors that influence NPLs. The vulnerability is continuously weakening the health of any financial organization such as banks.

There are strong relationship among bad management and NPLs. (Dimitrios et al., 2016) studied the effect of increasing NPLs by examining the European countries of 15 years data. They concluded that vulnerability of any bank is linked with bank policy regarding bad debt. Further, they exposed that bank management had great role to control flow of NPLs.

The increasing ratio of NPLs effects the banking operations. (Messai and Jouini, 2013) studied 20 years data of commercial banks for US economy and argue that exceeds in such variables like NPLs and loan losses provisions creates vulnerability of banking sector. Boudriga, Boulila Taktak, and Jellouli, (2009) analyzed on the bases of profitability and concluded that amount of NPLs is low in high earning and large size bank they do not generate risky loans. Large size banks have no issue of annual profit so they do not participate in risky loans.

Financial crises change the direction of banking work. (Sorge, 2004) conducted a panel study for Greece, Italy and Spain by using 15 years data of 85 commercial banks. They concluded that the above economies faced more amount of bad loan after the subprime crises in 2007-08. Further, they found that bad loans are negative related to profitability of banks and increasing rate of unemployment create more NPLs or loan loss reserves. Similarly, (Nkusu, 2011) studied the determinants of NPLs in three different dimensions.

They explain the increasing role of NPLs in credit facilitation institutions, the quality of bank management and political choices to the economy. Moreover, (Espinoza and Prasad, 2010) examined the determinants of NPLs for banking sector of European countries they derived that NPLs affect negatively the health of any financial institute. The discussion is explained in different dimension with significant empirical results.

2.1.2 Bank Profitability and NPLs

Profit is the result of the effort of management and profitability is the amount of return to the investor for their investment in the specific accounting period (Beck et al., 2013). Objective of business organizations is to maximization of share holders wealth. This tendency measures through different perimeters. Major indicators affect the tendency of generating profit. In this study profitability and efficiency are measured through return on equity (ROE) and return on assets (ROA). These both ratios can be used to determine the quality of management as used in the study of (Louzis et al., 2010).

Return on equity (ROE) and return on assets (ROA) are the two important indicators to measure financial health of the bank. Profitability ratios evaluates that how effectively a companys management is managing the capital that shareholders (Dimitrios et al., 2016). ROA is the amount of income by utilizing total assets of the company while ROE is the income out of managing equity part only.

The Bad management hypotjesis and non performing loans carrying a strong link with each other. (Sorge, 2004) examined the impact of expending non performing loan by evaluating the European banking system using their 6 years data from 2008 to 2014. They concluded that weakness of any bank is connected with increasing level of bad loans.

Furthermore they evaluated that efficiency of bank management is the sign of more profit. Similar study has conducted by (Reddy, 2003) for Indian banking system. They suggested that the bad loan directly decrease the annual profit of bank. They used ROE and ROA to forecast the profitability index and loan loss reserve to measure the level of non-performing loan.

The size of bank has great impact to control the bad loans. (Bacha, 1990) that low size of banks has more conservative policy regarding the addressing the loan. However, the medium and high size of banks has relaxed policy to bad loan. (Trung, 2014) examined the government and private sectors banks for Indian banks and used the financial data for the period of 10 years.

They examined the increasing ration of NPLs in both government and private sectors banks . They concluded that the private sector banks has strong grip on the bad loan. However, the government banks have no quick follow-up policy. Finally, they reveals that the ratio of NPLs in government banks are high then the private sector banks.

The crises change the direction of banking business and its direction. [Sorge \(2004\)](#) conducted a panel study for the banking system of Spain, Greece and Italy and by using 13 years data of 162 commercial banks. They examined that all the countries faced higher increment of non-performing loan after the financial crises in 2009. Additionally, they found that non-erforming loan are negative related to bank profitability and it promote the rate of unemployment in the specific country. Similar study [Nkusu \(2011\)](#) examined the NPLs in three different wide angles. They studied the increasing ratio of NPLs as the political choices to policy makers, the quality of bank management and finally the credit facilitation institutions. Moreover, [Espinoza and Prasad \(2010\)](#) examined the driver to increase the NPLs. They reviled that the NPLs affect negatively the health of the banks. The current study explains the in different dimension of non-performing laon with significant empirical results.

Factor profitability linked with non-performing Loans (NPLs) negatively. ([Girardone et al., 2004](#)) examined that the lower profitability the bank management will keep more allowances of loan loss provisions (LLP) to address the deficit gap. Creation of such accounts decreases the net profit and indicates the miss management. There is statistically significant and negative relationship among the profitability and increase in NPLs ([Dimitrios et al., 2016](#)). The Increased amount of NPLs signals that bank management could not allocate financial resources ([Abid et al., 2014](#)).

Keeton (1999) used the simple regression model for NPLs, they conclude that increase in loan growth leads the to more loan losses and creates more chances to default. Similarly, when bank increases their supply of loans, they make lower their minimum credit standards and decrease the rate of interest rates on loans. Pine, Chan, and Leung, (1998) measure the size of loans and NPLs. They conclude that

growth of loans effect NPLs positively. Ghosh, (2015) evaluate NPLs by assets to loan ratio, and reveal that ratio of loan extend to limit of assets of the bank.

Banks play an important role in the economy and facilitate liquidity to financial system. Banks provide deposit credit facility. Core of commercial banks is to accept deposits and provides loans using those funds to other customers to generate some higher returns (Sheefeni, 2015). Banks provide loans on bases of credit rating to corporations. Bank, sometime provide loan other than merit base, these loans are risky due to highest degree of default. As according to (Espinoza and Prasad, 2010) providing loan to lower credit rated institutions are the main reasons that loan become default for banks. To process loan and manage risk involved the banks collects more information about its debtor, if bank fails to obtain such information then it create problem of asymmetric information for the bank.

(Makri et al., 2014) when banks management approve loan on adverse selection base of credit creation process. Such loans cause a moral hazards and adverse selection problem. Furthermore, the adverse selection and moral hazards make a significant increase of non-performing loans in banks (Dimitrios et al., 2016). It is conclude that any bank to mark up loan they must conduct the pure evaluation process, then provide loan on merit of credit rating base because there are many other type of risks involve like obtained from other banks, loans borrower failure due to internally and externally change of macro and microeconomic conditions.

Once when loan recorded as NPLs, its not only affects the current returns but also affect the future cash inflows. To checked the lagged affect (Sheefeni, 2015) used time-series econometric techniques of impulse response functions for 15 years data ending 2014 for commercial banks of India. They used both return on assets (ROA) and returns on equity (ROE) to measures profitability. Their results reveal that loan to assets ratio, ROE, ROA, and log of total assets are continuously effect by non- performing loans the effect is observed in upcoming future returns.

Surag (2014) conclude that NPLs are negative related to profitability and opposite to asset to loan ratio and total assets. Similarly, Pine, Chan, and Leung, (1998) uses the GMM and estimate NPLs. they conclude that log of total assets are

negative related to NPLs. The assets size of banks dual related nature of NPLs in different regional studies.

Profitable banks do not engage in creating risky loans. They make normal profit and avoid to face credit risk. DeYoung and Berger (1997) following the bad management hypothesis also promote level of NPLs. Similar results concluded in the study of (Rajan, 1994). Consequently, the bank management follows the liberal credit policy and manipulates the current earnings. Similarly, the bank may attempt to convince and attract the borrower to generate high profit by inflating current earnings. The current study measures profits by return on assets (ROA) for banks of South Asia.

Some empirical studies argue that size of bank has significant influence regarding NPLs (Arellano and Bond, 1991; Louzis et al., 2010; Sorge, 2004). These studies argue that there is a significant relationship with NPLs. If size of bank increases they do not face low earning problems. They generate high returns and face the problem of NPLs. However, some studies conclude that manager of small size banks allowed debt to poor credit score holders (Fofack, 2005; Haniifah, 2015) to generate more return as result they face massive NPLs. Similarly, the managers of highly capitalized banks follow the assumption of too big to fail. They work on liberal credit principles and make normal earnings (Espinoza and Prasad, 2010). The current study examines the determinants of NPLs where profitability effect the current ratio of NPLs. lower NPLs signals the both good management policies and effective managerial skills (Haneef et al., 2012).

H1a: *There is a significant relationship between ROA and NPLs*

H1b: *There is a significant relationship between ROE and NPLs*

2.2 Macroeconomic Factors and NPLs

Recent global financial crisis 2007-08 has sparked the interest of policy maker to examine the determinants of NPLs in South Asia region. Different studies conducted for single economy analysis like panel and regression data models to measure the micro and macroeconomic variables. The empirical literature regarding NPLs is based on intermediation theory that examines the business cycle with the precise role of income tax rate. The theory of financial intermediation as explained by Gertler and Bernanke (1989) is related to use as a theoretical base model to examine the NPLs with a state level macroeconomic conditions.

Using bank specific data, Skarica (2014) studied NPLs in 20 European banks, and find both bank level and state level factors that influence ration of NPLs. Similarly, Klein (2013) uses 6 years quarterly data of 17 countries of Central Europe, to explore the macroeconomic driver of NPLs, the authors examine both inflation and unemployment rates to enhance the ratio of NPLs. Similarly, the real GDP growth effect level of NPLs negatively. However, Reiningger and Jakubik (2013) explore the NPLs for 12 Europe countries using the GMM estimations model with 10 years quarterly data, they finds that NPLs decrease with an increment in economic growth and prices index while increase in exchange rate, government debts and past periods NPLs increase the NPLs of present period.

Upturn and downturns are the crucial part of any economy. Firms make their profit by fluctuation of economy. The increase in NPLs signal the beginning of a banking crisis (Louzis et al., 2010; Nkusu, 2011) The current study attempted to explain aggregate NPLs of South Asian banks. Using quarterly data of 15 years (Chaibi and Ftiti, 2015) studied both bank specific and state level variables for two parallel economies of Germany and France. They finds that change in bank related variables are warning signs for increase in NPLs. Furthermore, they conclude that past year NPLs effect current year profitability.

Skarica (2014) studied the European banking system by using bank specific data, they find both bank level and state level factors that affect the ratio of NPLs. Klein (2013) uses the 12 years quarterly data of 17 countries of Europe; They

highlight the state level indicators of NPLs. Furthermore, they examine both the unemployment rates and inflation to increase the ratio of NPLs. Similarly, the growth of countrys GDP control the level of NPLs and develops more chances of employment. However, Reininger (2014) examined the NPLs for 19 different central Europe countries using the VAR estimations model with 16 years data. They conclude that the growth decrease the level of NPLs while promotion in government debts and exchange rate increase the existing level of NPLs of current period.

The fluctuation of economy same as the upturn and downturns are the crucial part of any financial market like the stock exchange of different economies. Mostly the corporations make their profit by these up and downs turns of the economy. The increment in the level of NPLs are the signal to banking crisis (Jakubk and Reininger, 2014). The current study explains the overall effect of NPLs in the South Asian banks. [Chaibi and Ftiti \(2015\)](#) studied both bank specific and state level variables using quarterly data of 11 years for two lagged economies of France and Germany. They studied that the change in bank bad loans are the warning signs for increase in future NPLs. Furthermore, they examined the persistence effect of NPLs.

2.3 Economic Size and NPLs

GDP and growth are the common indicators to measure the size of nationals economy. The growth of GDP appreciate business cycle positively and create more opportunities of earnings ([Sato, 2001](#)). However GDP growth is negatively associated to the level of NPLs. The increasing role of NPLs affects negatively the existing business stream. Using 20 years annually data of Indian national economy ([Fofack, 2005](#)) the authors find that, GDP growth creates better macroeconomic conditions for intuitions and strengthen the business cycle overall and concluded the negative association between NPLs and GDP growth.

Examining the economy of developed countries ([Beck et al., 2013](#)) studied 50 different countries for the period 20012012. They conclude that exchange rates,

GDP growth and stock index significantly related to NPLs. Similarly, (Espinoza and Prasad, 2010) use a panel regression model and evaluate 50 different size GCC banks using 16 years annual data from 1990 to 2005. They find that GDP growth control the rate of NPLs increase in interest rates promote level of NPLs. Similarly, (Beck et al., 2013) examine 25 different European countries for the period 1998 to 2009 and reveal that state level variables economic size government budget and FDI opposite related to NPLs.

However, Melecky and Buncic (2012) examined the NPLs by using 10 years data ending 2004 for 43 different capital sizes of United State commercial banks using GMM estimations. The state level variables includes the lagged year NPLs ratio, CPI inflation, GDP growth, interest rate and output gap. However, they find the NPLs effect negatively by GDP growth and statistically provide insignificant result for output gap. Further they explains that United State economy cannot effect from external macroeconomic changes.

The current study use both growth rates of state real GDP income tax revenue on personal incomes, as well as state unemployment rates examined to capture state economic activity. These regional economic variables highlight the effect of state business cycles on loan quality. The business cycle activities are measured by output gap. Following the broad literature and the study expect a negative impact of GDP growth to the increasing level of NPLs. Only GDP growth can control interest rate and inflation. Where the change in interest rate and inflation are very important for NPLs it increase the current ratio. Similarly the GDP growth is associated significant and negative to the NPLs.

The countrys GDP and the growth are the most relevant indicators used to measure the size of country the nationals economy. (Joseph Collins, Wanjau, and Author, 2011) the growth of GDP enhances the business cycle positively and creates more opportunities of employment. Additionally, the examined that the growth of GDP is negatively associated with the level of NPLs. The increasing ratio of NPLs affects the existing business stream negatively. Similar study conducted (Joseph Collins et al., 2011) by using 20 years annually data of Indian national banking system the authors find that growth of GDP make better macroeconomic

conditions for intuitions and strengthen the business cycle overall. Furthermore, they examined the negative linkage the between NPLs and GDP growth.

By studying the developed economy the exchange rates, GDP growth and stock index are significantly related to level of NPLs. [Espinoza and Prasad \(2010\)](#) use GMM estimation and evaluate 50 different size GCC banks by using the 15 years annual data from 1990 to 2004. Their result shows that the growth of the GDP controls the rate of NPLs increase in interest rates promotes level of NPLs. [Abid et al. \(2014\)](#) studied the 14 different European countries for the period 1998 to 2009 and reveal that state level variables FDI, government budget, and economic size are opposite effect the level of NPLs.

Buncic (2015) studied the NPLs by examining the 12 years data ending 2004 for 32 different commercial banks of United State. They applied the vector autoregressive VAR model. The country level variables includes the past year NPLs ratio, consumer prices index CPI inflation, output gap, GDP growth and interest rate. Finally, they conclude that the NPLs effects the GDP growth negatively and positive effect the output gap. Additionally, they explains that United State economy cannot effect from external macroeconomic changes.

H: *There is a significant relationship between GDP growth and NPLs*

2.4 Output Gap and NPLs

The output gap is an indicator that is used to find the difference between actual output and the maximum potential output of economy. Output gap normally expressed as a percentage to GDP ([Grigorian and Manole, 2006](#)). Output gap measure upturn and downturns or positive and negative turns of business cycle. Negative output gap indicates that actual outputs is below then the economy's full capacity of outputs and positive output are the outperforming of economy ([Judd and Rudebusch, 1998](#)) use output gap to measure the economic efficiency of a Bangladesh GDP and growth in comparison between actual output of GDP and maximum potential of GDP.

(Sato, 2001) studied that the output gap whether positive or negative is an unfavorable indicator for economy. The businesses exercise the efficiency to meet the demand level. However, the negative output gap directs the lack of demand for both goods and services in an economy. (Sato, 2001) concluded where production below their minimum level create decline in existing growth rate. However (Dimitrios et al., 2016) concluded that negative output gap is generally a sign of a slow and sluggish economy when overall economic demand is low. As discussed that output gap measure the changes in economy similarly in current study use such estimation for South Asia financial market. The said regions economies were changed several times. Economic changes affect the banking sector and specially increase the level of NPLs. By analyzing the empirical literature the current study estimates that output gap is an important driver of NPLs and affects it significantly.

The output gap may be positive or negative (Gerlach and Smets, 1999) considered the output gap as unfavorable for any economy. The corporations work to make efficiency and meet the demand level of production or delivering the services. The negative output gap pul the markets and directs the demand for both goods and services in an economy. (Giorno et al., 1995) concluded that the mass production creates the decline in existing profit. However, the negative output gap is generally a sign of a slow and sluggish economy when overall economic demand is low. Sato (2001) that output gap calculates the changes in economy. The study uses such estimation for South Asia banking sector. The economic changes affect the banking sector where an increase the level of NPLs. By analyzing the empirical literature the current study estimates that output gap is an important driver of NPLs and affects it significantly.

H4: *There is a significant relationship between Output Gap and NPLs*

2.5 Amount of Income tax and Non-performing Loan

The study examined the individual annual income tax payment to government. Where, an individual borrow bank if borrower has to pay higher income tax as result his disposable income will reduce. (Arellano and Bond, 1991) concluded if capacity to pay back loan to bank will influence and more chances to default. The study examines such effect at both level bank and state level of economy. The income tax ratio to GDP is expressed as the ratio of income tax that collected in specific period and compared to GDP. The income tax revenue upgrades GDP significantly (Dimitrios et al., 2016). The income tax to GDP ratio are different across economies similarly Sweden where tax ratio to GDP is 35%. However the Estonia has low tax ratio to GDP about 1%. Similarly the United State income tax ratio to GDP was 11.7% in 2014-15.

However, the current income of borrower creates opportunities pay loans, where the increase in income taxes or unemployment rate makes chances of default. All these are linked to the uncertainty regarding future and gross income of individual. The current study use both unemployment rate and increase in income tax revenue on personal incomes. Such macroeconomic variables highlight the effect of economy business cycles upturn and downturns. The business cycle activities are measured by output gap.

However, the default probability depends on borrower current income, tax ratio and the unemployment rate. All these are linked to the uncertainty regarding future income of individual and the lending rates. The current study use both growth rates of state real GDP income tax revenue on personal incomes, as well as state unemployment rates examined to capture state economic activity. These regional economic variables highlight the effect of state business cycles on loan quality. The business cycle activities are measured by output gap. Following the broad literature and the study expect a negative impact of GDP growth to the increasing level of NPLs.

Several empirical studies examine the influence of state level variables on NPLs and reveals different results. (Arellano and Bond, 1991) examine NPLs level for household using 15 years quarterly data for European banking sector. The author concludes that individual disposable income, monetary conditions and unemployment have a strong impact to ratio of NPLs. Additionally they argue that household whos borrowed and regularly pay installment, where the rate of income tax increase the disposable income of individual effect directly as a result the borrower fails to pay loan hence NPLs increases. However, (Tanasković and Jandrić, 2015) concluded that the problem loans are highly sensitive to the real interest rates and rate of income tax. Additionally they state that change in both interest rate and income tax rate are effect directly the households if they have some borrowed debt will unable to pay additional interest and the loan for bank becomes non-performing.

The increase in the income of borrower makes more opportunities pay loans to the banks, The increase in income taxes effect the income of a borrowers. Similarly, the rate of unemployment create the chances of default. These factors are associated with the income of an individual. The current study use the increase in income tax revenue on personal incomes. Such macroeconomic variables highlight the effect of economy business cycles upturn and downturns. The business cycle activities are measured by output gap.

H5: *There is a significant relationship between Income tax and NPLs*

2.6 Inflation and Non-Performing Loan

Nature of Inflation cause mixed implications for NPLs in some economy they provide appreciation and somewhere create decline. However, higher inflation can make debt servicing easier to the individuals. Similarly, the inflations declines can reduction in real value of outstanding loans. However, in case of appreciation the inflation associated positive to the unemployment. Chaibi and Ftiti, (2015) studied that the loan repayment capacity of borrowers to get worse by reducing

their disposable income. They find the positive relationship between inflation and NPLs.

Several empirical studies conclude ambiguous relationship between inflation and NPLs. Increasing in inflation rate it make lower the real value of loan to borrower, while at the same time inflation may affect the profitability of banks. However, (Skarica, 2014; Louizis et al., 2012; Nkusu, 2011) concluded inflation affect borrowers real income negatively. Similarly, If the income of borrower and rate of inflation increase in similar line it decrease the costs for both sectors households and corporate. This change make lowers the amount of available funds to make debt repayment Similar results concluded by (Louzis et al., 2010; Nkusu, 2011).

However an increase in interest rates it raise the real value of borrowers debt and makes debt servicing expensive to repay. This will increase the ratio of NPLs and loan defaults. Moreover, greater interest-rate uncertainty affects banks source of funds that in turn NPLs and hence influences loans growth (Elijah, 2014). South Asia where loan rates are variable, due to monetary policy actions for inflation it can adversely affect the borrowers loan servicing capacity. The study is examining the relationship of inflation to NPLs for the South Asia region.

H6: There is a significant relationship between Inflation and NPLs

2.7 Unemployment and Non-performing Loan

Unemployment is the deterioration of consumers ability to generate cash flow and to service debt. According to (Dimitrios et al., 2016) due to increase in unemployment the consumption of goods and services affect negatively. Additionally they conclude the relationship of unemployment with the NPLs is positive when unemployment increase the individual fails to pay debts. (Louzis et al., 2010) analyze the household debt sustainability for European countries and state that disposable income of individual, unemployment, and monetary conditions have a strong positive influence on NPLs.

Berger and Deyoung (1997) found that NPLs are highly sensitive for increase in real interest rates and unemployment. However, the increases in unemployment rate the economy ability to pay current deficits. The effect of unemployment on NPLs is therefore expected to be positive.

Lawrence (1995) introduces consumption theory, if a borrower with low incomes pay additional income tax has higher rates of default due to increased risk of facing unemployment. Similarly, the individual will unable to settle their obligations to the bank. Additionally, the banks impose higher interest rates from such riskier clients. However, Berger and Deyoung (1997) conclude that chances of failure depends on borrower current income, and ration of income tax.

H7: *There is a significant relationship between Unemployment and NPLs*

2.8 Government Budget and Debt with NPLs

The Governmental budget plays an important role to influence the flow of NPLs. From the last several years, the ratio of non-performing loans is increased more than 26 percent of the total loan on South Asia. The study examines the effect of improvement by government budget and taking government debt on earning of banking industry of the south Asian emerging economies. In addition the study anticipates a positive association between loan quality and government debt. As (Judd and Rudebusch, 1998) concluded that government budget has opposite and adverse relationship with government debt.

The competition across the banks is the major reason of growth in non-performing loan (Vithessonthi, 2016). Similarly providing credit other than merit base increase the ratio of NPLs (Alexiouand Sofoklis, 2009). However, the bank management creates efforts to reduce and control increasing amount of NPLs by introducing new regulations. Sanchis-arellano (2015) concluded that increasing rate of NPLs in banking industry are calls the financial crises. The increasing rate of NPLs creating an example in 2007-08 financial crises. (Skarica, 2014).

(Giorno et al., 1995) studied that government budget help to overcome output gap and increasing rate of NPLs. Additionally, they found that government budget opposite to the public debt and control the level of NPLs. however, (Makri et al., 2014) concluded that growth in GDP negatively affect NPLs while increasing rate of unemployment promote NPL inversely.

The study concludes that the government budget enhances the capabilities to create productive environment and viable financial system for the economy. Similarly, the surplus budget provides more opportunities to grow and create new ventures and businesses. Thus government budget provide stand to economy cover accumulated NPLs. However, governmental debt promotes level of NPLs and increase rate of interest. (Yongding, 2001) explore the effect of government debt for Euro zone and conclude that government debt create increment in level of NPLs. However, the increase in government debt positively increases the level of NPLs.

(Tanasković and Jandrić, 2015) concluded that public debt has more weighted then corporate or consumer debts. The source from where debt borrowed is highly effect the financial system. Additionally, they concluded that if government debt is obtained from domestic sources financial institutions then efficiency towards growth is highly affected. In addition if government debt is financed from some other external sources they increase the rate of interest and ultimate improve existing NPLs.

Government debt can affect NPLs positively. The deterioration of government debts affect liquidity of market evaluation to make credibility for the banks to make the liquidity. Different financial instructions borrow debts from banks and reinvest. However, the banks cutoff the lending rate and thus debtors cannot refinance their debts. Similarly, (Perotti, 1996) examined that a rise in public debt affects the overall fiscal measures, especially it decrease the social expenditure and wage component of government consumption.

However, the government debt make unserviceable number of outstanding loans, Additionally, the house holds personal income will experience a negative shock in repayment of personal debt with an increasing in interest rate, (Vatansever and Hepsen, 2015) examined that government debts effects the corporate loans

because it may take place due to decreasing demand. The current study use both the changes in federal budget (deficit or surplus) and government debt to measure the increment in level of NPLs as in studies of (Louzis et al., 2010) and (Makri et al., 2014)

H8: *There is a significant relationship between Govt. Budget (cash surplus) and NPLs*

H9: *There is a significant relationship between Govt. Debt and NPLs.*

Chapter 3

Research Methodology

This section contains data description and methodological framework of the study. The methodology sections deals about techniques and statistical tools that used to estimate econometric models to show the empirical results. The major sections can be stated as follow.

3.1 Description of Data

We use 10-years annual data of 80 banks from India, Pakistan and Bangladesh. The sample size includes 27 financial firms listed with Pakistan Stock Exchange PSX, 22 financial firms of Dhaka Stock exchange of Bangladesh and 28 firms listed with Bombay Stock Exchange of India. With reference to the size of bank, there are three types of bank sizes are selected, i.e. large capital, medium capital and small capital for the purpose of true representation of changes and effect of bad loans at each level. The bank specific variables collected from financial statement analysis (FSA) of different periods available at central banks and at relevant regional stock exchange. The data related to macroeconomic variables are collected from World Development Indicator, World Bank, International Financial Statistics (IFS) and countries central banks.

3.2 Variable Specification

This empirical study uses two different type of variables bank specific and country specific macroeconomic variables. We used non-performing loan NPLs as dependent variable. The set of explanatory bank specific variables includes the return on assets (ROA) and return on equity (ROE) which shows the performance of bank, total assets of the bank, and ratio of loan to total deposits deals with the size and loanable amount respectively of specific bank.

On the other hand, macroeconomic factors are also used as a vector of control variables that includes percentage of income tax rate to GDP output gap to capture the economic downturn. GDP growth (Chaibi and Ftiti, 2015; Dimitrios et al., 2016), inflation rate (Messai and Jouini, 2013), unemployment rate (Abid et al., 2014), governmental budget and debt also consider an important macroeconomic variables while examining NPLs (Dimitrios et al., 2016). The variables and their definition, with expected sign of variables show in Table 3.1.

TABLE 3.1: List of variables and expected signs

VARIABLE	DEFINITION	EXPECTED SIGN
<i>Dependent Variable</i>		
<i>NPLs</i>	The Ratio of non-performing loan to the total loan	Positive
<i>Independent Variables</i>		
<i>Bank Specific Variables</i>	Return on assets is the total net Income to total assets after tax in a specific period.	Negative
ROA		
ROE	ROE is net income to the total equity after tax	Negative
Total assets	Total fixed and current assets after tax	Negative
Net income	Net income after tax from ordinary operations of the bank	Negative
<i>Macroeconomic variables</i>		
GDP Total	Total Gross Domestic Production of the country	Negative
GDP Growth	The percentage growth rate of real GDP	Negative
Inflation rate	Inflation rate as percentage change of CPI	Positive
Unemployment rate	Unemployment rate in percentage term of total labor force of the country	Positive
Tax total	The total amount of taxes as a percentage of GDP	Positive
Government Budget deficit	Government annual budget as percentage of GDP (Deficit)	Positive/Negative
Govt. Debt	Government total debt as percentage of GDP	Positive/Negative
Output Gap	Proxies for business cycle to measure economic downturn Calculated using HP Filter	Positive

The source of variables that used in the study is as: Non-performing Loans (NPLs) and profitability ROA, ROE their economic data derived from the financial statement of every commercial bank. While financial data of macroeconomic variables are derived from World Bank (World Development Indicator WDI). Government budget of India, Bangladesh and Pakistan are obtained from the Reserve Bank of India, Bangladesh Bank and the State Bank of Pakistan respectively.

3.3 Variables Justification, Model and Estimation Technique

NPL itself represents the bad loans that do not generate income for the bank. Different parameters are use to convert bad loans into NPL while the study use 90 days gap. When an individual do not pay their loan installment, interest or any one of them form the last 90 days.

The return on assets (ROA) and return on equity (ROE) are the ratios that used in the study to measure the profitability of the bank. Different studies conducted for developed economies ([Dimitrios et al., 2016](#)) and ([Makri et al., 2014](#)) examined the determinants of NPL in banking sector using ROE and ROA. The final profit after tax is to be distributed among the equity holders (Fama and French, 1988). These ratios are linked with NPL because the NPL finally decrease the amount of final profit. The level of NPL whenever increases it is to be deduct form the reserve account of loan loss reserve ([Girardone et al., 2004](#)). Hence, the NPL decrease the level of ROA and ROE. The total assets and net income are used to construct the ROE and ROA.

The macroeconomic variables are used to examine the country level effect on banking performance. Some important drivers are examined that affect the NPL either negative or positive. The total GDP and GDP growth of rate of the economy are used to measure the business cycle (Bacha, 1990a). The Hodrick and Prescott (HP) filter are used to separate the cycle from the trend in the business cycle used by ([Dimitrios et al., 2016](#)). The inflation rate is used that is the inflation rate

is the percentage change in consumer prices index (CPI). Similarly the variable unemployment is basically the rate of unemployment in percentage term of total labor force in the specific country.

The income tax ratio to GDP is expressed as the ratio of income tax that collected in specific period and compared to GDP. The figure income tax is the individual annual income tax pay to government annually. The individual has to pay higher income tax as result his disposable income will reduce the capacity to pay back loan has affect (Arellano and Bond, 1991). In this section the study explore both bank and country level effect of economy. The income tax to GDP ratio is different across considered economies.

The study measure the income as rate of income tax in percentage to the GDP. The study uses the income tax not the total tax. Furthermore it is examined that if an individual households borrow from the bank while they face the increment in the income tax level. The government budget in every country Bangladesh India and Pakistan are deficit facial budget. The government budget is the percentage to GDP. The last important variable is the output gap. Output gap used the separate the cycle form the trend with the help of HP filter.

The study employs two different nature of variables bank specific and country specific variables affecting the NPLs by using annual data. The study used both static and dynamic panel data model. For static model, the fixed effect model has been used. However, for dynamic model the study used Generalized Method of Moment (GMM) technique developed by Arellano and Bound (1991), Arellano and Bover (1995) and Blundell and Bound (1998). We used GMM for possible effect of endogeneity issue (Arellano and Bond, 1991) or performance of current year effect on past year performance (Dimitrios et al., 2016). The current study tackles the issue of endogeneity and use the lagged term as an additional external instrument. GMM developed by Arellano and Bound (1991), Arellano and Bover (1995) and Blundell and Bound (1998). The current panel study is adopting the dynamic approach in order to investigate the time persistent of non-performing (NPLs).

The study introduces two new variables in order to test their explanatory power, taken stem from the empirical literature in explaining of NPLs. They are the

income tax rate as percentage of GDP and output gap of business cycle measure the economic downturn. If a borrower has faced and pays higher income tax, his disposable income will be reduced and, hence, his capacity to pay back his debt to bank will follow suit (Dimitrios et al., 2016).

3.4 Hodrick and Prescott Filter

Output gap is used as a proxy for business cycle to capture the cyclic component. This study use Hodrick and Prescott (1997) afterward HP filter. It is common in the business cycle literature that the data must be filtered to extract the stationary (cyclical) and the non-stationary (trend) components. This is carried out because following (Lucas 1977), and Kydland and Prescott (1990) business cycle is defined as deviations of aggregate real output from trend. Business cycle affects as the statistical properties of the co-movements of output deviations from trend with deviations from trend of other aggregate time series. To examine the cyclical aspects of Gross Domestic Product (GDP), we first de-trends each series using Hodrick and Prescott (1997) HP filter. The HP filter decomposes a time series y_t into an additive cyclical component, and trend components.

$$y_t = y_t^T + y_t^c \quad (3.1)$$

For any series y the HP filter decomposes the trend (non-stationary) component y^T represents the long run movements in the series, and the cyclical (stationary) component i.e. $y_t^c = y_t - y_t^T$ arising from business cycle fluctuation. The HP filter removes a smooth trend from some give data y_t by solving

$$\min \sum_{t=1}^T [\ln(y_t) - \ln(y_t^T)]^2 + \lambda \sum_{t=1}^{T-1} [\ln(y_{t+1}^T - y_t^T) - \ln(y_t^T - y_{t-1}^T)]^2 \quad (3.2)$$

$$\min \sum_{t=1}^T \ln(y_t^c)^2 + \lambda \sum_{t=2}^{T-1} [\Delta \ln(y_{t+1}^T) - \Delta \ln(y_t^T)]^2 \quad (3.3)$$

y_t is the natural logarithm of the series at time t . $y_{t-1}^T y_t^T y_{t+1}^T$ is the trend components at time $t-1$, t , $t+1$. y_t^c is the cyclical components at time t . The residual $(y_t - y_t^T)$ is the deviation from trends over a long time periods, there average is nearly to zero. It is referred to cyclical components, and is the object of the economic interest. The second term is the sum of squares of the growth components second difference, i.e. smoothness of y_t^T . λ is the smoothing parameter, that reflects the relative variance of the two components. The larger the value of λ , the higher is the smoothness. If $\lambda = 0$ then the filtered series is the original series, i.e. there is no smoothing. If λ approaches infinity, then growth components correspond to a linear trend. We adopt the value of $\lambda = 6.25$ recommended by (Ravn and Uhlig 2002). We use both static and dynamic type of models. The general form of the model are given as,

$$\text{Model 1: } NPL_{it} = \beta_0 + \beta_1 ROA_{it} + \beta_2 ROE_{it} + \epsilon_{it} \quad (3.4)$$

NPL represent non-performing loan it is dependent variable of the study. In model (i) bank specific variables are used that is the return on assets (ROA) that show the profitability of specific bank, and return on equity (ROE) that show the effectiveness of specific bank management. Where, i represent (cross section) South Asian overall banking sector and t represent time annually and ϵ_{it} represent error term.

Model 2:

$$NPL_{it} = \beta_0 + \beta_3 BUDG_{it} + \beta_4 EXTD_{it} + \beta_5 GDPGR_{it} + \beta_4 TAX_{it}/GDP_{it} + \beta_7 UNMP_{it} + \beta_8 GDPM10_{it} + \beta_9 INF_{it} + \epsilon_{it} \quad (3.5)$$

Model 2 represents the macroeconomic factors where, BUDG used for government fiscal budget (either deficit/surplus) annual, EXTD represent government external debts, GDPGR represent annual GDP growth, TAXINC used for Income tax rate, UNMP represent unemployment rate while GDPM10 represent output gap and finally INF used for Inflation rate.

Model 3 show the absorption of macroeconomics variable with bank specific variables

Model 3:

$$\begin{aligned} NPL_{it} = & \beta_o + \beta_1 ROA_{it} + \beta_2 ROE_{it} + \beta_3 BUDG_{it} + \beta_4 EXT D_{it} + \beta_5 GDPGR_{it} + \\ & \beta_4 TAXINC_{it} + \beta_7 UNMP_{it} + \beta_8 GDP M10_{it} + \beta_9 INF_{it} + \epsilon_{it} \end{aligned} \quad (3.6)$$

In order to estimate the econometric model the study implements the GMM model to show the effect of any individual variable on NPLs ratio. It is examined that change in macroeconomic variables can affect the amount of NPLs. The study used the first period lagged ($t-1$) to capture the persistence from past period. The GMM capture the existence of endogeneity issue, if any. To test for the persistence and time error regarding NPLs the study take lagged NPLs (NPL_{t-1}) as an explanatory variables. Where, NPLs as an explanatory variable in the study the positive and significant sign is expected.

Chapter 4

Results and discussion

4.1 Results

The study empirically examine the determinants of non-performing NPLs in banking sector of emerging South Asian economies of India, Bangladesh and Pakistan are examined. For that different econometric techniques are exercised. The empirical results of different models are shown in separate tables.

4.2 Descriptive Statistics

The Table 4.1.1 shows the summary of variables used in the study. NPLs used to determine the credit risk faced to the banking sector (Jakubk and Reininger, 2014). The descriptive statistics contain mean to show the average of data. Where standard deviation shows the explanation like how data deviate from the mean. Finally, the maximum value and minimum value for all observations are also reported.

The summary statistics about NPLs shows that the mean of NPLs across the region is 0.077 with the standard deviation of 0.090. The maximum recorded value of NPs across the South Asia banks is 0.63 however, the minimum value record as .00006. There is high variation in maximum and minimum record values of NPLs the reason is that somewhere, banks are closed due to high accumulation

of NPLs (Beck et al., 2013). At the same time, some banks report stable earnings due to their good management practice (Reddy, 2003). The profitability represents by ROA and ROE. Their mean value shows 0.079 and 0.018 for ROE and ROA respectively, while the standard deviation is of ROE is 0.594 and 0.229 for ROA. The maximum value of ROE is 2.3 while minimum value is -14.0. Where the maximum value of ROA is 0.20 and the minimum value is -0.260.

The mean of the government annual fiscal budget is - 3.15 with a standard deviation of 2.10. The maximum value of the government annual fiscal budget is record as - 0.104 and the minimum value as - 8.00. The negative sign shows that the budget announced in deficit (Dimitrios et al., 2016).

The mean of GDP growth shows 5.77 with the standard deviation of 2.1. Similarly, the maximum value of GDP growth is 10.25 while minimum value is 1.60. Where mean of external debt across all economies are 23.15 with the 4.5 standard deviation. The maximum value of external debts is 34.75 however, the minimum value of 16.54. The summary statistics of income tax represent that the mean is 0.10 and standard deviation 0.014. The maximum value of income tax records as 0.12 and the minimum value is .06. The amount of tax for South Asia is quite low as compare with developed economies (Arnold and Lipscomb, 2014).

The mean value of unemployment rate is 40.0 and the standard deviation for unemployment is 10.0. Similarly, the maximum value of unemployment record as 60.0 and the minimum value are 20.14. The South Asia rate of unemployment is high as comparison with developed countries (Ekanayake et al., 2013). The descriptive statistics of inflation shows the mean value is 8.84 and the standard deviation 3.33. However, the maximum value of inflation is records 20.2 and the minimum value is 2.53. Both unemployment ratio and inflation rate are high in the south Asia with compression with the European countries (Reddy, 2003). Finally, the summary statistics of output gap is recorded as the mean value is 12.7 with 1.15 value of standard deviation. Where, the maximum value of output gap is 15.5 and minimum value record as 11.1 NPLs represent Non-performing Loan in South Asian Banks; ROE and ROA represents a profitability of the bank, BUDGT is used for Govt. Budget Deficit/surplus, TAX is used for the income tax amount

TABLE 4.1: Descriptive Statistics

Variables	Mean	Std. Div.	Max.	Min.
NPL	0.0777873	0.0907835	0.6304826	0.0000643
ROE	0.0799099	0.5946125	2.347147	-14.74267
ROA	0.018748	0.0229983	0.2094585	-0.265188
BUDGET	-3.159122	2.102447	-0.1047608	-8.006559
GDPGR	5.773331	2.104159	10.25996	1.606692
EXTDBT	23.15482	4.539086	34.75344	16.54156
TAX	0.1000167	0.0149304	0.1299858	0.0691726
UNMPL	40.05519	10.00392	60.00024	20.14753
INF	8.849156	3.331829	20.28612	2.539516
LGDPM	12.78731	1.152648	14.55525	11.18191
<i>N</i>	800	800	800	800

paid by an individual, UNMPL is capturing the rate of Unemployment, INF means the Rate of Inflation. GDPGR is used for growth while LGDPM is log of GDP and LGDPM10 is the proxy to capture output gap.

4.3 Correlation Matrix

The dynamic panel estimation further, the study notes the variables for the problem of multicollinearity. Correlation matrix shows the direction and strength of the relationship between two variables in the form of positive and negative series starting from 1 with the higher correlation and near to zero show the weak relationship between the variables (Makri et al., 2014). The correlation matrix is presented in Table 4.2.1. The relationship between all explanatory variables with each other is examined. Lower correlation value mean explains state lower explanatory power in the model from selected independent variables.

The Table 4.2.1 explains as government fiscal budget and government external debts are negative correlated with value of -0.30. It consists that, if external debts increase more budget will spend to pay debts and interest. However, the government fiscal budget and annual GDP growth are positive related with value of 0.50 in each other. Similarly, the unemployment and inflation are negative

related to government budget. It indicate if unemployment and inflation arises more budget will be spent to control both the unemployment and inflation (Calza, 2009). At the same time, Inflation and unemployment are positive correlated in each other.

Profitability both variables ROA and ROE are positive related with government fiscal budget valued 0.06 and 0.07 for ROA and ROE respectively. The income tax and budget are negative related in each other. The correlation among GDP growth and government external debt are negative if growth increase the debts will decrease (Markowitz, 1952). The correlation among income tax and output gap is positive related, while However, when the value exceeds than .70 of correlation than collinearity problem will be existed among the particular variables (Reddy, 2003).

TABLE 4.2: Correlation

	BUDGT	EXTD	GDPGR	INF	GDPM10	ROA	ROE	TAX	UEMPLY
BUDGT	1								
EXTD	-0.384	1							
GDPGR	0.50745	-0.6777	1						
INF	-0.1369	0.4679	-0.4364	1					
GDPM10	-0.2407	-0.4824	0.47158	-0.06043	1				
ROA	0.07944	-0.1052	0.09717	-0.13161	-0.031	1			
ROE	0.06378	-0.1389	0.11321	-0.09501	0.043	0.31652	1		
TAX	-0.4465	-0.2986	0.21892	-0.24284	0.49	-0.0549	0.001	1	
UEMPLY	-0.2044	0.69986	-0.547	0.07718	-0.519	-0.06509	-0.1	0.045	1

NPLs represent Non-performing Loan in South Asian Banks; ROE and ROA represents a profitability of the bank, BUDGT is used for Govt. Budget Deficit/surplus, TAX is used for the income tax amount paid by an individual, UNMPL is capturing the rate of Unemployment, INF means the Rate of Inflation. GDPGR is used for growth while LGDPM is log of GDP and GDPM10 is the proxy to capture output gap.

4.4 Empirical Findings

In the final section the determinants of non-performing loan has been examined. The study used the panel regression model. Both static and dynamic models are used. The static model explained by Fixed Effect and Random Effect model. The Table 4.3 and 4.4 show the fixed and random effect. Finally, the generalized method of moment (GMM) estimation are presented that proposed first time by (Arellano and Bond, 1991). Empirical results of the study are compatible with the theoretical literature. The estimation is conducted in three different static and dynamic models to capture the separate effect of bank level variables and state level variables.

4.5 Determinants of NPLs: Fixed Effect

The fixed effect assumption is when an individual specific variables effect is correlated with the dependent variable of NPLs. Where the random effect assumption is that, when an individual variable affects unrelated to the dependent variable NPLs. The study explains three different models. Model (i) explains macroeconomic variables such as external debt, government fiscal budget, GDP growth, unemployment, inflation, income tax and the output gap. However, the Model (ii) related to bank-specific variables ROE and ROA represents profitability of the particular bank. Similarly, the Model (iii) explains both bank level and country level variables.

TABLE 4.3: Determinants of NPLs: Fixed Effect

VARIABLES	Model 2	Model 1	Model 3
BUDGT	-0.0117**		-0.0129***
	-0.00511		-0.00483
EXTD	-0.0011		-0.00172
	-0.00147		-0.0014
GDPGR	-0.00122		-0.00202
	-0.00126		-0.00146
TAXINC	0.17592		0.315
	-0.0483		-0.0467
UNMPL	0.01714*		0.01870**
	-0.08872		-0.0815
GDPM10	-0.0573		-0.0428*
	-0.0355		-0.0348
INFL	0.04901		0.049
	-0.0023		-0.002
ROE		-0.00990**	-0.0110***
		-0.00446	-0.00345
ROA		-0.538*	-0.573*
		-0.29	-0.293
Constant	-0.0362	0.0833***	-0.0171
	-0.0328	-0.00239	-0.0315
Observations	800	800	800
R-squared	0.078	0.054	0.14
Number of bank ID	800	800	800

In Table 4.3 of Fixed Effect Model the ROA and ROE were found significant and negatively related to the NPLs consistent with different model. However, the value of ROE is highly significant in every model. Its explains that if profitability increases the size of NPLs will decrease. The results are consistence with following empirical studies (Chaibi and Ftiti, 2015; Dimitrios et al., 2016; Louzis et al., 2010). The increase in NPLs effect profitability negatively its the first hypothesis of the study, the negative relationship support the bad management hypothesis

(Berger and Deyoung, 1997). The banks that generate higher income are less likely to participate in a loan which is unsafe or risky activities, such banks restrict to generate risky loan.

The study focus when macroeconomic variable changes, then how it affects NPLs. The governmental annual budget is found highly significant to the NPLs. More precisely in both Model (i) and Model (iii) of Fixed Effect Model the government fiscal budget is negatively related to NPLs. Governmental budget reflects the fiscal policies imposed by government regarding public and private debts (Boudriga et al., 2009). The results show that government budget overcomes the bad loans and provides better opportunities of business sector improvement.

It is important to study the budget is surplus or deficit. The existing budget of selected countries are deficit that unable to generate expected growth and fails to control the flow of increasing rate of NPLs. (Dimitrios et al., 2016) reported the budget as positive for European countries, where the budget announced surplus which creates more chances of growth in economy. However external debts of selected economies are significant and positively associated with NPLs, where debt of the country increases the cost of borrowing, when external debt and interest rate increases, resultant they push NPLs upward. These findings are in agreement with the study done by (Haniifah, 2015) whose work asserted that external debt affects the level of NPLs positively. (Inekwe, 2013) supports the above findings by stating that increase in external debt creates more chances to be default.

Furthermore, to measure the difference between actual and potential output of the business cycle of selected economies the proxy of Output Gap ($Y - Y_f$) is used. The study finds that our new variable output gap significantly affects the quality of loan portfolio in both fixed effect model and GMM model. Similarly, the results are contrary with theory and negatively related to NPLs (Dimitrios et al., 2016).

The income tax is another important variable of the study. By examining the empirical literature, it was estimated that income tax percentage of GDP will influence the increasing size of NPLs. The empirical results show that income tax is insignificant in fixed effect model. Similarly, literature argues that income tax should be positive and significant (Dimitrios et al., 2016) studied for European

financial market. The results for the South Asia banks are quite different the reason is that the rate of income tax collections is very low as compare to developed economies (Abid et al., 2014). The low percentage amount of income tax cannot predict the ratio of NPLs with percentage change in income tax. Where, in south Asia there is poor system of revenue collection by government and numbers of businesses are not fully taxed as (Mirzaei, Moore, and Liu, 2013), so the results are not translated as like developed markets.

The rate of unemployment found to have a significant in fixed effect model estimations. Similarly, the inflation is positive and insignificant for selected the economies. The result supports Park and Zhang, (2012) that there is strong positive relationship between unemployment and increasing amount of NPLs. The literature also supports the increase in unemployment rate the overall opportunity of earning decrease and the individual capacity to bay back loan to the bank will affect. Similarly, (Abid et al., 2014; Dimitrios et al., 2016) argue that almost in both markets developed and developing unemployment increases the ratio of NPLs.

4.6 Determinants of NPLs (Difference and System GMM)

The Table 4.4 represents generalized method of moments (GMM) model. GMM is a generic method for estimating parameters in statistical models. These moment conditions are functions of the model parameters and the data, such that their expectation is zero at the true values of the parameters. In the given table the shows the profitability (ROA) is significant and highly related with NPLs in both difference and system GMM models. At the same time ROE gives same results like ROA. These results consists with most empirical studies regarding NPLs determinants (Ekanayake et al., 2013; Loan and Banks, 2009; Makri, Tsagkanos, and Bellas, 2014; Nationalbank, 2012). The results also consist with fixed effect model.

Similarly, the government fiscal budget is significant and negative associated to NPLs in both difference and system GMM models. The results confirm that government budget helps to overcome the debts and provide better opportunities for business sector (Trung, 2014). Similarly the government external debt is highly significant in GMM model. It represent if government borrow more external debts the interest rate will increase as a result the level of NPLs increases. As Boudriga, Boulila Taktak, and Jellouli, (2009) concluded that higher leverage of debt increase the interest rate. Kauko, (2012) examined if internal interest rate increases it will affect the current tax rate.

The current study also examined if interest rate increases. The disposable income of individual household will reduced due to higher income tax payment and they failed to pay borrowed loan to the bank. As result the level of NPLs increase. The results consists with empirical study of (Dimitrios et al., 2016) for the European countries. However, the income tax is insignificant in the current model. The scenario for South Asia emerging countries is quite different. There are many reasons as low tax collection as cited by Jakubik et al., (2011).

In Table 4.4 of GMM model the unemployment and inflation are significant and positive related to NPLs. the results shows that if unemployment rate increases the individual will reduced and the payment of loans to bank will effect as studied by (Sheefeni, 2015). Similarly, the inflation is significant and positive related to NPLs. Most empirical studies regarding NPLs concluded the same results (Boudriga et al., 2009; Haneef, Rana, and Karim, 2012; Nationalbank, 2012).

The output gap is an important variable of the study. The current model of GMM represent the output gap is significantly affects the quality of loan portfolio. The output gap is negative related to NPLs so it is derived that, it incorporates the potential growth of any economy thus it reducing level of NPLs. the results are contrary with (Dimitrios et al., 2016)

TABLE 4.4: Determinants of NPLs (Difference and System GMM)

VARIABLES	-1 Differenced GMM	-2 System GMM
NPL (-1)	0.479***	0.197***
	-0.0246	-0.0285
ROE	-0.00465**	-0.000619
	-0.00225	-0.00224
ROA	-0.373***	-0.255***
	-0.0674	-0.0658
BUDGT	-0.0021	-0.00299**
	-0.0014	-0.00143
EXTD	0.00213***	0.00104
	-0.000693	-0.000701
TAX	0.15601	0.17201
	-0.0216	-0.0214
UNMPL	0.01069***	0.0410***
	-0.0309	-0.0315
GDPM10	-0.0716**	-0.0557*
INFL	0.038039	0.037122
	-0.00245	-0.00233
Constant	-0.0739***	-0.0259
	-0.027	-0.0275
Observations	720	640
Number of bank ID	800	800

Chapter 5

Conclusion and recommendation

5.1 Conclusion

The aim of the study is to examine the role of tax on personal income with additional variable of output gap as potential explanatory variables. The study also examines the determinants of non-performing loans like credit risk faced to banking sector of selected South Asian economies. Moreover, South Asian banking sector with some additional indicators such as weak income tax collection system and rapid changes in the business cycle are studied, which, differentiate it from other developed and developing economies. The vulnerability of the banking sector with important determinants classified in banks-specific variables and macroeconomic indicators also discussed. The dynamic panel estimation is used with strong balance panel data for the period of 10 years from 2006 to 2015 among 80 different banks of the selected countries.

The study uses three different dynamic panel estimations models. Two different nature of variables are used, the bank specific and country specific variables. In first model the bank level variable used. The bank specific variables related to risk preference and management skills were found to face future NPLs. The profitability ratios ROA and ROE are found highly significant with NPLs. The results indicate that, if profitability of banks change then it affect the level of NPLs. The results are caliber with previous empirical studies.

Moreover, the role of government fiscal budget is very important in setting off strategic planning to set the economical targets and control the bad loans faced to financial institutions. Additionally, when external debts are increases, the opportunities of growth decreases and finally NPLs are increasing. However, the increasing role of unemployment and inflation same as previous literature and related to NPLs positively.

The result confirms that output gap is significantly and negatively related to NPLs. Output gap capture the upturns and downturns of any economy. It is reported with the help of using output gap, if economy effect from external financial changes it effect the level of NPLs. The study finds that output gap is significantly affecting the quality of loan portfolio in every model. Similarly, the results are contrary with theory and negative related to NPLs. Furthermore, the results of the current study corroborate with the results of previous studies on the determinants of NPLs. However, the role of income tax would not found to be significant with NPLs where the South Asian markets are quite different from developing economies. There is very low income tax amount collected mostly transactions are not taxed properly. The overall findings of the study indicate that the default failure of the banking sector across the country are not due to internal factors like low profitability, bad management or moral hazard and lack of expertise, there are some important external macroeconomic factors that play an important role in changing the business conditions of banking sectors across countries.

5.2 Recommendations

The study has important implications for regulatory bodies and policy makers. To make expertise internally in banking sectors and makes able the bank management to use resources efficiently and address the risk effectively. The government required to provide better opportunities of employment for individuals to make earnings and payments against loans. Hence, decision making authorities need to set effective macroeconomic policy regarding unemployment and inflation rate control. Furthermore, the policy maker also required to provide safeguard and

diversify the credit risk in creating loan portfolio. All the findings could be helpful when designing macro-prudential and fiscal policy.

Banks References Used in Study

TABLE 5.1: List of Banks Used for Bangladesh

S. No.	Bank Name	Bank ID
1	Bank Asia Ltd	BAL
2	BRAC bank Ltd	BRAC
3	BRAC bank Ltd	BRAC
4	Eastern Bank Ltd	EBL
5	IFIC Bank Limited	IFIC
6	Jamuna Bank Ltd	JBL
7	Mercantile Bank Ltd	MBL
8	Mutual Trust Bank Ltd	MTB
9	National Bank Limited	NBL
10	One Bank Ltd	OBL
11	Premier Bank Limited	PBL
12	Prime Bank Limited	PB
13	Standard Bank Limited	SBL
14	The City Bank Limited	CBL
15	Trust Bank Bangladesh Ltd	TBB
16	Agrani Bank Limited	ARBL
17	Basci Bank Ltd	BBL
18	Janata Bank Limited	JB
19	Rupali Bank Limited	RBL
20	Sonali Bank Limited	SB
21	AB Bank Limited	AB
22	Dhaka Bank Ltd	DB
23	Pubali Bank Limited	PBBB

TABLE 5.2: List of Banks Used for India

S. No.	Bank Name	Bank ID
24	Ahmadabad BL	AHBI
25	Andra BL	ABI
26	Bank of Baroda	BB
27	Bank of India	BI
28	Bank of Maharashtra	BM
29	Canara Bank	CB
30	Central Bank of India	CBI
31	Corporation Bank	CBBI
32	Dena Bank	DBI
33	Indian Bank	IBI
34	Punjab & Sind Bank	PSB
35	Punjab National Bank	PNBI
36	UCO Bank	UCO
37	Union Bank of India	UBI
38	United Bank of India	UB
39	Axis Bank	AXB
40	DCB Bank	DCBI
41	HDFC Bank	HDFC
42	ICICI Bank	ICICI
43	IndusInd Bank	IB
44	Karnataka Bank	KB
45	Karur Vysya Bank	KVB
46	Lakshmi Vilas Bank	LVB
47	South Indian Bank	SIB
48	IDBI Bank	IDBIB
49	Indian Overseas Bank	IOB
50	SCB Ltd	SCBL
51	Yes Bank	YB
52	Syndicate Bank	SB

TABLE 5.3: List of Banks Used for Pakistan

53	Fisrt women Bank	FWB
54	National Bank	NBP
55	Bank of Khybar	BOK
56	Bank of Punjab	BOP
57	Allide bank	ABL
58	ASKRI Bank	ABP
59	ALFALAH Bank	ALF
60	BANK ALHABIB	BA
61	FAYSAL BL	FS
62	Habib Bank Ltd.	HBL
63	HABIB METRO PB	HM
64	JB BANK Ltd.	JBP
65	KAS Bank Ltd.	KASBL
66	Muslim Comercial Bank Ltd.	MCB
67	NIB Ltd.	NIB
68	SAMBA Bank Ltd.	SAMBA
69	SILK Bank Ltd.	SILK
70	SONERI Bank Ltd.	SNB
71	SC BANK Ltd.	SCB
72	SUMMIT Bank Ltd.	SMT
73	United bank Ltd.	UBL
74	PIC LTD	PICL
75	PKIC LTD	PKIC
76	PLHC Ltd	PLHC
77	POIC Ltd	POIC
78	SPIAIC Ltd	SPIAIC
79	AMB Ltd	AMB
80	Khushali Bank Ltd.	KBP

Bibliography

- Abid, L., Ouertani, M. N., and Zouari-Ghorbel, S. (2014). Macroeconomic and bank-specific determinants of household's non-performing loans in tunisia: A dynamic panel data. *Procedia Economics and Finance*, 13:58–68.
- Arellano, M. and Bond, S. (1991). Some tests of specification for panel data: Monte carlo evidence and an application to employment equations. *The review of economic studies*, 58(2):277–297.
- Beck, R., Jakubik, P., and Piloiu, A. (2013). Non-performing loans: What matters in addition to the economic cycle?
- Chaibi, H. and Ftiti, Z. (2015). Credit risk determinants: Evidence from a cross-country study. *Research in international business and finance*, 33:1–16.
- Dimitrios, A., Helen, L., and Mike, T. (2016). Determinants of non-performing loans: Evidence from euro-area countries. *Finance research letters*, 18:116–119.
- Espinoza, R. A. and Prasad, A. (2010). *Nonperforming loans in the GCC banking system and their macroeconomic effects*. Number 10-224. International Monetary Fund.
- Fofack, H. (2005). Nonperforming loans in sub-saharan africa: causal analysis and macroeconomic implications.
- Gerlach, S. and Smets, F. (1999). Output gaps and monetary policy in the emu area1. *European Economic Review*, 43(4-6):801–812.
- Gerlach, S. and Wensheng, P. (2006). Output gaps and inflation in mainland china. *China Economic Review*, 17(2):210–225.

- Gerlach, S. and Yiu, M. S. (2004). Estimating output gaps in asia: A cross-country study. *Journal of the Japanese and International Economies*, 18(1):115–136.
- Giorno, C., Richardson, P., Roseveare, D., and Van den Noord, P. (1995). Estimating potential output, output gaps and structural budget balances.
- Girardone, C., Molyneux, P., and Gardener, E. P. (2004). Analysing the determinants of bank efficiency: the case of italian banks. *Applied Economics*, 36(3):215–227.
- Haneef, S., Riaz, T., Ramzan, M., Rana, M. A., Hafiz, M. I., and Karim, Y. (2012). Impact of risk management on non-performing loans and profitability of banking sector of pakistan. *International Journal of Business and Social Science*, 3(7).
- Haniifah, N. (2015). Economic determinants of non-performing loans (npls) in ugandan commercial banks. (5(2)):137–153.
- Inekwe, M. (2013). The relationship between real gdp and non-performing loans: Evidence from nigeria (1995–2009). *International Journal of Capacity Building in Education and Management (IJCBE M)*, 2(1):2350–2312.
- Louzis, D. P., Vouldis, A. T., and Metaxas, V. L. (2010). working paper.
- Makri, V., Tsagkanos, A., and Bellas, A. (2014). Determinants of non-performing loans: The case of eurozone. *Panoeconomicus*, 61(2):193.
- Messai, A. S. and Jouini, F. (2013). Micro and macro determinants of non-performing loans. *International journal of economics and financial issues*, 3(4):852.
- Nkusu, M. M. (2011). *Nonperforming loans and macrofinancial vulnerabilities in advanced economies*. Number 11-161. International Monetary Fund.
- Sato, K. (2001). Japans potential output and the gdp gap: a new estimate. *Journal of Asian Economics*, 12(2):183–196.

- Sheefeni, J. P. S. (2015). Evaluating the impact of bank specific determinants of non-performing loans in namibia. *Journal of Emerging Issues in Economics, Finance and Banking*, 4(2):1525–1541.
- Sorge, M. (2004). Stress-testing financial systems: an overview of current methodologies.
- Suzuki, Y., Miah, M., Yuan, J., et al. (2008). China's non-performing bank loan crisis: the role of economic rents. *Asian-Pacific Economic Literature*, 22(1):57–70.
- Tanasković, S. and Jandrić, M. (2015). Macroeconomic and institutional determinants of non-performing loans. *Journal of Central Banking Theory and Practice*, 4(1):47–62.
- Vatansever, M. and Hepsen, A. (2015). Determining impacts on non-performing loan ratio in turkey. *Journal of Applied Finance and Banking*, 5(1):1.
- Vithessonthi, C. (2016). Deflation, bank credit growth, and non-performing loans: Evidence from japan. *International review of financial analysis*, 45:295–305.
- Yongding, Y. (2001). A review of chinas macroeconomic development and policies in the 1990s. *China & World Economy*, 6:3–12.

Appendix-A

TABLE 4: Descriptive statistics -Bangladesh

Variables	Mean	Std. Div.	Max.	Min.
Instruments	Mean	Std. Div.	Max.	Min.
NPL	0.05937	0.06439	0.57154	0.00367
ROE	0.13175	0.2921	0.48309	-2.7408
ROA	0.01264	0.01029	0.051	-0.0493
BUDGET	-0.3037	0.41168	-0.1048	-1.4432
GDPGR	0.06197	0.00556	0.07059	0.05045
EXTDBT	21.8643	2.59787	26.5752	18.5999
TAX	0.08455	0.01247	0.10962	0.06917
UNMPL	0.04395	0.00135	0.0453	0.0426
INF	3.19744	0.25569	5.05864	2.04513
LGDPM	11.681	0.31121	12.1812	11.1819
GDPM10	0.698	0.02354	0.02888	-0.0421
<i>N</i>	800			

NPLs represent Non-performing Loan in South Asian Banks; ROE and ROA represents a profitability of the bank, BUDGT is used for Govt. Budget Deficit/surplus, TAX is used for the income tax amount paid by an individual, UNMPL is capturing the rate of Unemployment, INF means the Rate of Inflation. GDPGR is used for growth while LGDPM is log of GDP and LGDPM10 is the proxy to capture output gap.

TABLE 5: Descriptive statistics-India

Instruments	Mean	Std. Div.	Max.	Min.
NPL	0.02783	0.01915	0.15008	0.00117
ROE	0.1294	0.07283	0.25272	-0.5193
ROA	0.00854	0.00535	0.02472	-0.0228
BUDGET	-0.4527	0.28507	-0.5706	-0.3187
GDPGR	0.07428	0.01789	0.1026	0.03891
EXTDBT	19.7845	2.57476	23.3988	16.5416
TAX	0.11184	0.00914	0.12999	0.09943
UNMPL	0.03706	0.008	0.049	0.0253
INF	5.42787	1.78939	8.25996	2.89096
LGDPM	14.2523	0.25749	14.5553	13.7633
GDPM10	0.90861	0.06616	0.10971	-0.089
<i>N</i>	800			

NPLs represent Non-performing Loan in South Asian Banks; ROE and ROA represents a profitability of the bank, BUDGT is used for Govt. Budget Deficit/surplus, TAX is used for the income tax amount paid by an individual, UNMPL is capturing the rate of Unemployment, INF means the Rate of Inflation. GDPGR is used for growth while LGDPM is log of GDP and LGDPM10 is the proxy to capture output gap.

TABLE 6: Descriptive statistics-Pakistan

Instrument	Mean	Std. Div.	Max.	Min.
NPL	0.144661	0.11161	0.63048	6.4E-05
ROE	. 0149253	0.96094	2.34715	-14.743
ROA	0.0057616	0.0371	0.20946	-0.2652
BUDGET	-0.627077	0.65507	-0.9516	-0.1207
GDPGR	0.0371892	0.01415	0.06178	0.01607
EXTDBT	27.70561	3.55433	34.7534	22.8549
TAX	0.1004807	0.00902	0.11988	0.08943
UNMPL	0.05557	0.00656	0.0624	0.0406
INF	3.718917	1.41502	6.17754	1.60669
LGDPM	12.17872	0.21251	12.5101	11.8297
GDPM10	0.5003111	0.03518	0.05569	-0.0567
<i>N</i>	800			

NPLs represent Non-performing Loan in South Asian Banks; ROE and ROA represents a profitability of the bank, BUDGT is used for Govt. Budget Deficit/surplus, TAX is used for the income tax amount paid by an individual, UNMPL is capturing the rate of Unemployment, INF means the Rate of Inflation. GDPGR is used for growth while LGDPM is log of GDP and LGDPM10 is the proxy to capture output gap.

TABLE 7: Correlation Bangladesh

	NPL	ROA	ROE	BUDGT	EXT	GDPGR	INF	LNGDPM	TAX	UNMPL
NPL	1.000000									
ROA	-0.412609	1.000000								
ROE	-0.381817	0.612879	1.000000							
BUDGT	0.027569	0.036704	0.068238	1.000000						
EXTD	-0.119996	0.239096	0.192292	0.601568	1.000000					
GDPGR	-0.106024	-0.13945	-0.09553	0.598839	0.135083	1.000000				
INF	-0.096917	0.112121	0.005269	-0.01641	0.088530	0.331084	1.000000			
LNGDPM	0.157345	-0.24533	-0.15274	-0.52658	-0.54998	-0.11955	-0.22442	1.000000		
TAX	0.019765	-0.29231	-0.16796	-0.41865	-0.59059	0.069756	-0.26012	0.558660	1.000000	
UNMPL	-0.160303	0.344933	0.235034	0.471851	0.449417	-0.22578	0.044671	-0.35032	-0.45555	1.000000

NPLs represent Non-performing Loan in South Asian Banks; ROE and ROA represents a profitability of the bank, BUDGT is used for Govt. Budget Deficit/surplus, TAX is used for the income tax amount paid by an individual, UNMPL is capturing the rate of Unemployment, INF means the Rate of Inflation. GDPGR is used for growth while LGDPM is log of GDP, which is the proxy to capture output gap.

TABLE 8: Correlation India

	NPL	ROA	ROE	BUDGT	EXT	GDPGR	INF	LNGDPM	TAX	UNMPL
NPL	1.000000									
ROA	-0.565024	1.000000								
ROE	-0.547344	0.805331	1.000000							
BUDGT	-0.024114	-0.01724	0.029665	1.000000						
EXTD	0.221077	-0.08277	-0.21197	-0.37663	1.000000					
GDPGR	-0.093192	-0.05274	-0.01303	0.607934	-0.41567	1.000000				
INF	-0.223617	0.113337	0.181093	0.384511	-0.06708	0.065302	0.077551	1.000000		
LNGDPM	0.144730	-0.04404	-0.13611	-0.2168	0.776246	-0.18079	0.494772	0.155807	1.000000	
TAX	0.028170	-0.11951	-0.2146	-0.12883	0.371711	-0.01404	0.265570	-0.507662	0.208089	1.000000
UNMPL	0.290052	-0.14413	-0.25352	0.318529	0.552700	0.128915	0.354354	-0.313197	0.304302	0.553793

NPLs represent Non-performing Loan in South Asian Banks; ROE and ROA represents a profitability of the bank, BUDGT is used for Govt. Budget Deficit/surplus, TAX is used for the income tax amount paid by an individual, UNMPL is capturing the rate of Unemployment, INF means the Rate of Inflation. GDPGR is used for growth while LGDPM is log of GDP, which is the proxy to capture output gap.

TABLE 9: Correlation Pakistan

	NPL	ROA	ROE	BUDGT	EXT	GDPGR	INF	LNGDPM	TAX	UNMPL
NPL	1.000000									
ROA	-0.26528	1.000000								
ROE	-0.19234	0.272131	1.000000							
BUDGT	-0.2144	-0.02905	-0.02464	1.000000						
EXTD	-0.25151	-0.04646	-0.06596	0.662600	1.000000					
GDPGR	-0.08379	0.142209	0.091018	0.261641	0.044314	1.000000				
INF	-0.04302	-0.13641	-0.0823	0.123132	0.382403	-0.5132	1.000000			
LNGDPM	0.251592	0.054552	0.062873	-0.519149	-0.49439	0.003112	-0.43993	1.000000		
TAX	0.093370	0.108747	0.090374	-0.271599	-0.5136	0.443357	-0.35321	0.463551	1.000000	
UNMPL	0.072151	-0.02967	-0.02302	0.325318	-0.03388	0.098779	-0.18799	0.030727	0.374578	1.000000

NPLs represent Non-performing Loan in South Asian Banks; ROE and ROA represents a profitability of the bank, BUDGT is used for Govt. Budget Deficit/surplus, TAX is used for the income tax amount paid by an individual, UNMPL is capturing the rate of Unemployment, INF means the Rate of Inflation. GDPGR is used for growth while LGDPM is log of GDP, which is the proxy to capture output gap.