Assessing Macroeconomic and Country-Level Institutional Factors as Determinants of Non-Performing Loans in Pakistani Commercial Banks

Ihtesham Khan[*], Adnan Ahmad[†], Muhammad Faizan Malik[‡] and Muhammad Ilyas[§]

Abstract

The purpose of this paper is to assess the macroeconomic factors such as GDP growth rate, exchange rate, tax rate, inflation, unemployment, tax rate and country level institutional factors as determinants of NPLs. Using secondary data for the period from 2006-16, panel data techniques as well as GMM method analysis are applied to investigate the determinants of NPLs. Results show that GDP growth rate, exchange rate, inflation, Unemployment, Tax rate and country level institutional factors (control of corruption, political stability, government effectiveness, regulatory quality, voice and accountability) affect NPLs in different ways. The paper concludes that not only macroeconomic variables are important determinates of NPLs but that institutional and regulatory environment also affect NPLs in reducing its ratio. Policy implications such as stringent regulations in advancing loans and their respective collection methods as well as monetary policy needs to be taken into consideration before approving loans to any lender.

Keywords: Macroeconomic Factors, Country Level Institutional Factors, Non Performing Loans (NPL), GMM Method of Regression Analysis Techniques.

Introduction

In Pakistan, banking sector is the main source of financing. Although stock market is another source of financing but in developing economies such as Pakistan, raising funds from such sources other than banks

[*] Ihtesham Khan, PhD Scholar, Institute of Business Studies and Leadership, Abdul Wali Khan University, Mardan, Pakistan.

[†] Dr. Adnan Ahmad, Assistant Professor, Institute of Business Studies and Leadership, Abdul Wali Khan University, Mardan, Pakistan.

[‡] Dr. Muhammad Faizan Malik, Assistant Professor, Institute of Business Studies and Leadership, Abdul Wali Khan University, Mardan, Pakistan. Email: faizanmalik@awkum.edu.pk

[§] Muhammad Ilyas, Lecturer, Institute of Business Studies and Leadership, Abdul Wali Khan University, Mardan, Pakistan.

become difficult for new companies. Despite several regulatory and developmental reforms, the financial system is still performing below par. This may be due the government interference in the banking sector (Nkusu, 2011**)**. The government has the responsibility to develop a conducive environment for the banking sector to survive (Dash &Kobra, 2012**)**. The development of the macroeconomic environment that also includes the institutional factors is very important for any banking sector survival (Fofack, 2005). The financial sector assessment programs (FSAP) conducted in Pakistan by the World Bank, reports high level of unproductive debts in this region (World Bank, 2015).

Financial institutions play the role of a back bone in any economy. Every sound economic system requires a strong financial system with the ability to absorb any financial crises (Dash & Kobra, 2012**)**. The Central bank or the State bank of each country has the key role to play in this regard to prepare financial institutions for such financial jolts. The economic sustainability of an economy largely depends upon a sound financial system. In sound economies it is the responsibility of the central banks to develop regulations and policies regarding the operational activities within in a country. At the same time it is the responsibility of the banks to follow and implement those regulations and policies in their banks and report to state bank accordingly (Fofack, 2005). Thus, keeping a sound financial system is an important determinant of a sound economic system but a poor performance and economic system may jeopardize the otherwise good performance of banking institutions.

Different determinants are kept as a yard stick for measuring the performance of the banking industry. One such factor is the NPL. Banks performance can be badly damaged by the increasing level of NPLs (DeYoung & Whalen, 1994). Literature reports that the increasing level of NPLs in banks caused the financial crises in US (Sinkey & Greewalt, 1991). Fofack (2005) argues that in African countries the main source of economic crises was the rising levels of NPLs. This strand of literature concludes that NPLs has an adverse effect on the financial sector of a country be that a developing or a developed country. Dash and Kobra (2012**)** examine the relationship between macroeconomic variables and NPLs and find that the high risk banks had greater chance towards defaulted loans.

In Pakistan same problem exists. The State bank of Pakistan (SBP) has been trying hard in terms of keeping NPL limits within control but for the last 25 years, the NPLs figure has not fallen below double digit (SBP, 2016). The average level of NPLs in Pakistan is 14.87% from

1995 till 2016. Currently Pakistan has been 24th in terms of high levels of NPL countries.

For any country the resilience against financial crises is only possible through stability in its banking sector. The success of banking sector can only be assessed by the profit it generates. Although banking sector works on different objectives such as socio economic development goals set by the government implemented through central banks of different countries, creation of employment opportunities, large number of branches within different parts of the country to attract different markets, growth and generation of profit. All this may be possible, if the NPL level is kept low otherwise the rising level of NPL can fail a profitable industry to a failed industry. In this regard, a detailed study is required to determine the factors that affect the level of NPLs in Pakistani banking industry especially considering macroeconomic factors and institutional indicators i.e. Country level institutional factors. Thus the aim of this study is to investigate the effect of not only macroeconomic indicators but also country level institutional determinates of NPLs in the context of a developing country; i.e. Pakistan.

This research intends to achieve the following objectives:

- To determine the factors contributing towards the high level of NPLs in Pakistani banks.
- To investigate the effect of macroeconomic factors on NPLs.
- To examine the impact of institutional factors i.e country level institutional factors on NPLs.

This research investigates to answer the following questions.

1. What are the macroeconomic factors that greatly influence NPLs?
2. What are the institutional factors i.e country level institutional factors that contribute towards NPLs in banks?

Significance of the Study

This study focuses banks operating in Pakistan. This study will provide an opportunity to determine the main determinants of NPLs that affect either positively or negatively. The banks lend to all the sectors of the economy and government as well but rising defaults on these loans are a matter of great concern for the banking sector. The study presents an opportunity for banks working in Pakistan to redevise their strategies in lending loans. The study will help banks in reducing the NPLs level in banks that in return will provide new opportunities such as new

investment, job creation, and new credit lines and will help in boosting the economy of the country.

Literature Review

NPL definition varies from country to country. NPLs are the bad loans that are due to be paid for 90 days or more (IMF, 2005). The State bank of Pakistan (2010) has also classified loans that are overdue for a specific period into different categories. The basic categories are three, i.e Substandard, doubtful and loss. If the loan installment is due by ninety days or more and is not being repaid will be termed as substandard loan. 25% provisioning will be done on the outstanding loan and will termed as NPLs. If the installment is overdue by 180 days or more will be termed as doubtful. 50% provision will be done on the outstanding loans. If the installment is overdue by one year or more will termed as loss and 100% provisioning will done to the outstanding loan.

Keeton and Morris (1987) are being considered as the pioneer in terms of establishment of relationship between the NPLs and macroeconomic factors of the country. They also concluded that one main reason behind high NPLs levels are the bad position of the macroeconomic condition of the country. It was also being observed and analyzed that NPLs are not the direct contributor to the economy but it has an indirect effect of the whole economy (Drees &Pazrbasioglu, 1998). Now if remedial and timely measures are not being taken it may lead to financial crises in the economy.

Adebola, Wan Yousaff and Dahalan (2011) are of the view point that a countries macroeconomic factors has an impact on the financial performance of the banking sector.

Macroeconomic Factors and Non-Performing Loans

Initially the macro-economic variables will be elucidated, that might have an influence on the Non-Performing-loans and the macro-economic variables are yearly change in GDP, unemployment rate, Real exchange rate, Tax rate and Inflation rate. Although, the extant of Literature that had investigated the relationship between macroeconomic variables and NPL, and the findings had established only theoretical models rather than giving an empirical evidence.

A negative relation exists between NPL and growth in GDP (Jimenez & Saurina, 2009). It is obvious that the growth in the income level of the people within an economy increases loan repayment capacity of the borrower. That at the end reduces the level of NPL in the banking sector of that economy (Khemraj & Pasha, 2009). They analyze the relationship between the inflation rate and the NPL's strength, they find

that a direct relationship exists between them. Although, on the contrary, Nkusu (2011) finds that the natural connection between NPLs and inflation rate can either be direct or inverse. Rationally, the increasing inflation rate will cause increase in the borrowers' incomes while the physical value of the credit will mitigate, thus the raising inflation rate will enhance the borrower's credit paying ability.

Jimenez and Saurina (2005) examine the Spanish banking area and the data range was from1984to2003, and they find that a surge in NPLs is caused by the slow GDP growth, immense real interest charges and the expanded credit environment due to the easycreditconditions. A positive relationship exists between NPL and unemployment in an economy of the country (Gambera, 2000). But on the other hand theoretical back ground of this relationship shows that a negative relationship exists between NPL and unemployment. If a person has availed loan from a bank and that person is an employed person. Suddenly he/she losses his/her job then how he/she will repay that loan so in that case NPL increases. In the same way if a business unit has availed loan facility from a bank and suddenly unemployment has hit the economy of the country this may reduce the demand level in that country because of the low purchasing power of the people then the repayment capacity of the borrower will be reduced. That at the end induces increase in the level of NPL in the country (Louzis, Vouldis & Metaxas, 2012).

Different researchers are of different views about the relation of exchange rate with NPL. Khemraj and Pasha (2009) are of the view that a positive relation exist between NPL and Real effective exchange rate. An increase in the exchange rate may affect the loan payment capacity of the borrower (Fofack, 2005) or on the other hand those borrowers who borrow loan in foreign currency then increase in exchange rate will have a positive relation.

Interest is the sole income of banks from which the depositor's rate, tax and other expenses are paid. Now, the banks strategically shift the tax expenses in their credit portfolios to the corporate sector or cleverly reduces the depositor's rate (Albertazzi &Gambacorta, 2006). Hence, the banks have the system of shifting the tax expenses to its debtors by increasing loan service charges (Khan *et al*., 2011).Similarly, the banks with greater liabilities deducting taxes are because of the immense mark-up charges. Specifically, there was no purposeful investigation for establishing the natural connection between the tax rate and NPL's but logically higher tax rate will increase non-performing loans because the higher tax rate will deprive the borrowers of cash and rationally will affect his loan servicing capability.

Country-level Institutional Factors

The institutional framework consist of two components i.e. 1) Country level institutional framework 2) Company level institutional framework (corporate governance). Petschnig (2005) reports the institutional framework as "the organizational entities, procedures and practices of financial regulation and supervision, including issues such as competences and the distribution of powers". Institutional framework helps us understand the concept of country level regulatory frame work and company regulatory frame work (corporate governance). The institutional environment includes the legal and judicial framework, the political stability, and the degree of corruption control. These factors can be exemplified by Sarbanes-Oxley Act of 2002 provisions. This act not only strength the country level regulatory framework but also company level governance mechanism. Heffernan (2005) argues that US banking system was dominated by the world's most complex banking industry. In response to repetitive banking collapses counteractive institutional measures were taken to safeguard the US financial system.

Another strand of research studies country level institutional factors as a proxy for the institutional quality in a country. For example Kaufmann et al. (2008) study six indicators as a reflection of governance and institutional quality of a country. The six dimensions of governance provided are 1) voice and accountability (*VA*) which measures the extant of political and civil rights; 2) political instability and violence (*PS*) which indicates the likelihood of violent threats or changes in government; 3) government effectiveness (*GE*) as an indicator of the competence and the quality of public service delivery; 4) regulatory burden (*RQ*) which encompasses the incidence of market-unfriendly policies; 5) rule of law (*RL*) as a proxy for the quality of contract enforcement, the police and the courts, as well as the likelihood of crime and violence; and 6) control of corruption (*CC*) which indicates the exercise of public power for private gain, including both soft and grand corruption and state capture (Kaufman et al., 2008). The six governance indicators are measured on a scale ranging from -2.5 to 2.5, with higher values corresponding to better governance (Kaufman et al., 2008).

Data and Methodology

Data

This paper investigates the effect of macroeconomic factors and country level institutional factors on NPLs. Secondary data for the period 2006-16 is collected based on the criteria of balanced sampling. A total of 20 sample banks were selected based on the criteria of their operations that started before 2006 and had not merged till 2016, so that homogeneity

can be created in the data set. The data is panel in nature and has been collected from the State Bank of Pakistan, World Bank, Economic Survey of Pakistan and respective banks' web sites.

Methodology

Since this investigation was spawned to examine the association between the non-performing loans and macroeconomic elements and country level institutional factors, a rational analysis is carried by following the deductive approach. A Deductive-analysis mechanically causes the laws or principles to generalize to specific instance and the underlying study is pure-objective in nature. Thus, quantitative-study technique is used to analyze the outcome on the recognized causers of non-performing loans.

Variables Used

Based on the above discussion the following variables are used. Details given in Table 1 (available at Annex A). However, as all the governance factors cannot be run together because of high correlation among the independent variables, so an index is being developed using PCA method. In STATA Principal Component Analysis (PCA) command is being used to develop the components of the variables then the Eigen values will be used of those components which has value higher than 1. The rotate command in STATA will be used that will give the orthogonal varimax, that gives the variation of each variable in each component. At last the predict command will be used to develop the index, here we have created an Index for country level governance by the name of WGI. At the same time individual regression was run with the macroeconomic variables and all the six variable indexes developed by Kaufman for country level governance performance measurement.

Empirical Model

In order to assess the macroeconomic impact on the NPL the following model is used.

The following 8 regression models are proposed for the macroeconomic and Country level institutional factor analysis.

Model 1, shows macroeconomic factors run separately with NPL.

$$NPL_{it} = \alpha 0 + \beta 0 GDP\_GRRATE_{it} + \beta 1 INFLAT_{it} + \beta 2 REER_{it} + \beta 3 UNEMPL_{it} + \beta 4 TAXRATE_{it} + \varepsilon t, \quad (1)$$

Model 2, shows macroeconomic variable and country level institutional governance index (WGI) regressed with NPL.

$$NPL_{it} = \alpha_0 + \beta_0 GDP\_GRRATE_{it} + \beta_1 INFLAT_{it} + \beta_2 REER_{it} + \beta_3 UNEMPL_{it} + \beta_4 TAXRATE_{it} + \beta_5 WGI_{it} + \varepsilon_{it}, \quad (2)$$

Model 3, shows macroeconomic variable and control of corruption (CC) regressed with NPL.

$$NPL_{it} = \alpha_0 + \beta_0 GDP\_GRRATE_{it} + \beta_1 INFLAT_{it} + \beta_2 REER_{it} + \beta_3 UNEMPL_{it} + \beta_4 TAXRATE_{it} + \beta_5 CC_{it} + \varepsilon_{it}, \quad (3)$$

Model 4, shows macroeconomic variable and government effectiveness (GE) regressed with NPL.

$$NPL_{it} = \alpha_0 + \beta_0 GDP\_GRRATE_{it} + \beta_1 INFLAT_{it} + \beta_2 REER_{it} + \beta_3 UNEMPL_{it} + \beta_4 TAXRATE_{it} + + \beta_5 GE_{it} + \varepsilon_{it}, \quad (4)$$

Model 5, shows macroeconomic variable and political stability (PS) regressed with NPL.

$$NPL_{it} = \alpha_0 + \beta_0 GDP\_GRRATE_{it} + \beta_1 INFLAT_{it} + \beta_2 REER_{it} + \beta_3 UNEMPL_{it} + \beta_4 TAXRATE_{it} + \beta_5 PS_{it} + \varepsilon_{it}, \quad (5)$$

Model 6, shows macroeconomic variable and regulatory quality (RQ) regressed with NPL.

$$NPL_{it} = \alpha_0 + \beta_0 GDP\_GRRATE_{it} + \beta_1 INFLAT_{it} + \beta_2 REER_{it} + \beta_3 UNEMPL_{it} + \beta_4 TAXRATE_{it} + \beta_5 RQ_{it} + \varepsilon_{it}, \quad (6)$$

Model 7, shows macroeconomic variable and rule of law (RL) regressed with NPL.

$$NPL_{it} = \alpha_0 + \beta_0 GDP\_GRRATE_{it} + \beta_1 INFLAT_{it} + \beta_2 REER_{it} + \beta_3 UNEMPL_{it} + \beta_4 TAXRATE_{it} + RL_{it} + \varepsilon_{it}, \quad (7)$$

Model 8, shows macroeconomic variable and voice and accountability (VA) regressed with NPL.

$$NPL_{it} = \alpha_0 + \beta_0 GDP\_GRRATE_{it} + \beta_1 INFLAT_{it} + \beta_2 REER_{it} + \beta_3 UNEMPL_{it} + \beta_4 TAXRATE_{it} + VA_{it} + \varepsilon t, \quad (8)$$

NPL = Non Performing Loan, GDP_GRRATE= GDP Growth Rate, INFLAT = Inflation rate, REER = Real Exchange Rate, UNEMPL= Unemployment Rate, TAXRATE= Tax Rate, CC= Control of Corruption, GE= Government Effectiveness, PS= Political Stability and Absence of Violence/ Terrorism, RQ= Regulatory Quality, RL= Rule of Law, VA= Voice and Accountability

Results and Data Analysis

This section presents descriptive statistics; correlation matrix; and GMM panel least square regression models.

Descriptive Statistics

Table 2 Descriptive matrix for banks

VARIABLES	Obs	Mean	Std. Dev.	Min	Max	SKEWNESS	KURTOSIS
NPL	220	10.156	8.487	0	51.56	1.81	3.78
GDP_GRRATE	220	1.275	0.440	0.474	1.820	-0.667	2.100
INFLATION RATE	220	10.651	6.295	1.810	20.666	0.429	1.766
REAL EXCHANGE RATE	220	4.645	0.0823	4.548	4.808	0.869	2.55
TAXRATE	220	3.578	0.116	3.453	3.781	0.72	1.949
UNEMPLOYMENT RATE	220	1.738	0.069	1.605	1.830	-0.65	2.28
WGI	220	-1.82	1.000	-0.973	2.179	1.047	2.725
CC	220	-0.882	0.146	-1.070	-0.661	-0.112	1.422
GE	220	-0.672	0.143	-0.812	-0.360	1.047	2.725
PS	220	-2.533	0.192	-2.806	-2.036	1.321	4.624
RQ	220	-0.599	0.077	-0.711	-0.448	0.274	2.285
RL	220	-0.845	0.066	-0.974	-0.739	-0.212	2.221
VA	220	-0.848	0.067	-0.972	-0.747	0.083	2.164

The skewness of all macroeconomic variables as they lie between the thresholds (i.e. +1.96 to -1.96) and shows that these variables tend to be normal. The GDP growth rate minimum value is 0.4741 while the maximum value is 1.82 and skewness is -.667. The inflation rate minimum value is 1.81 while the maximum value is 20.66. The real exchange rate varies from 4.528 to 4.8. The unemployment rate and tax rate ranges from 3.45 to 3.78 and 1.67 to 1.83. The skewness of both variables lie within the normality range. Country level governance index by the name of WDI is developed. WDI highest value is 2.179 while minimum value is -0.973 and Standard deviation (SD) 1.00 and the skewness is 1.047, which is within the normality range. The Control of Corruption (CC) has minimum value of -1.07 while the maximum value is -0.661, so the SD is 0.146. The skewness is -0.112 and the kurtosis is 1.422. The Government Effectiveness (GE) and Political Stability (PS) has minimum value of -0.812 and -1.8, respectively while the maximum value is -0.36 and -2.036, so the SD goes like 0.143 and 0.1926, respectively. Moreover, the Regulatory Quality (RQ) and Rule of Law (RL) has minimum value -0.711 and -0.947 respectively while the maximum value is -0.448 and -0.74, so the SD for both of them is 0.077 and 0.066 respectively. The skewness for RQ is 0.275 and for RL is -0.213, which means that both the variables lie within the normality range. Last but not the least the voice and accountability (VA) minimum value is -0.973 and maximum value is -0.747, thus, the SD between the maximum and minimum value is 0.0675 and the Skewness is 0.0837.

Correlation Analysis

The correlation matrix in table 3 (available at Annex B) represents the relationship between dependent and independent variables. We can see that NPL has a negative relationship with GDP_GRRATE, WGI, CC, GE, PS, RQ, RL, VA while it shows a positive relationship with INFLAT, REER and UNEMPL. As reported by Gujrati (2003) that the variables will have multicollinearity problem, if the correlation between independent variables is or greater than 0.80. The highest value in terms of correlation between independent variables in 0.72, so we can say that our variables are free from the multicollinearity bias.

Heteroscedasticity Statistics

White's test for Ho: homoscedasticity against Ha: unrestricted heteroscedasticity

χ^2 (10) = 7.87

Prob > χ^2 = 0.6413

White test was conducted to check for the heterogeneity problem. The above test clearly suggests that our regression will not suffer from heterogeneity problem as the value is much higher than the level of significance in terms of probability level.

GMM Estimation Method

In order to cater the problem of endogeneity, heteroscedasticity and autocorrelation the best solution is GMM method analysis (Roodman, 2006). Thus the study uses system GMM for analysis.

Table 4 (available at Annex C) presented above shows system GMM. In order to tackle the problem of endogeneity GMM style has been used. Eight different models are being developed. In model 1, macroeconomic variable ae being regressed with nonperforming loan. Lag dependent variable shows a significant positive relationship while GDP_GRRATE shows a significant negative relationship while INFLAT, REER and UNEMPL and TAXRATE shows positive relationship. As a rule of thumb in GMM style analysis number of instruments should be less than a number of groups. So in our regression number of instruments are 19 while the number of groups are 20. The Hansen test does not reject the null of over identifying restrictions at any conventional level of significance (p=0.227). Hence, it is indication that the model has valid instrumentation. As required, AR(2) the null hypothesis of no autocorrelation must not reject but in our analysis both AR(1)(p=.138), AR(2)(p=0.582) reject the null hypothesis. So this combination supports the validity of the instruments (Roodman, 2009a). In model 2, all the macroeconomic factors and WGI are regressed with

NPL. WGI and GDP_GRRATE show negative and significant relationship with NPL at level 1%.

The number of instruments in model 2 are 13 that are less than 20, which is the required limit. The rejection of null hypothesis with Hansen test P value is higher than 0.05 level i.e. p=0.152. The AR(1) and AR(2) are 0.087 and .688 that shows rejection of null hypothesis of over identifying restrictions.

The model 3, 4, 5, 6, 7, 8 shows lag dependent variables, macroeconomic variables and six country level governor indicators for each model to be regressed with NPL. All the models fulfill the criteria of less number of instruments then number of groups. The Hansen test in all the six models shows a P value higher than 0.05 rejecting the null hypothesis of over identifying restrictions.

Most of the macroeconomic factor shows significant relationship with NPL. Even most of the country level governance indicator that includes CC, GE, PS, RQ and VA shows a negative significant relationship with NPL while RL shows negative but insignificant relationship with NPL.

Conclusion

The financial institutions operating in an economy are greatly influenced by the macroeconomic factors (Keeton & Morris, 1987). To test the impact of macro-economic factors and country level institutional factors on NPL, the study proposes a regression model to be estimated. A total of 220 observations are used for both dependent and independent variable. The macro economic factors include GDP growth rate, inflation rate, unemployment, real exchange rate and tax rate while the country level institutional factor include control of corruption, government effectiveness, political stability, regulatory quality, rule of law, voice and accountability and an index is developed by the name of world governance index. A total of 8 models are proposed. model 1 include macro-economic variable, model 2 uses macro-economic variables and world governance index from model 3 to model 8 macro-economic variables are included while the Kaufmann country level governance indexes already discussed above were regressed separately.

GDP growth rate shows a negative and significant relationship with NPL. OLS, fixed effect, random effect and system GMM confirms almost the same results. Moreover the same negative and significant association is reported by many researchers (Louzis, Vouldis& Metaxas 2011; Khemraj& Pasha, 2009; Salas &Suarina, 2002; Rajan& Dhal, 2003; Fofack, 2005; and Jimenez &Saurina, 2009). Moreover, it is

obvious that with increase in the level of income of the people with in economy, it increases the loan payment capacity of the borrowers.

Kemraj and Pasha (2009) analyze the relationship between inflation rate and NPL and they find a direct relationship. Nkusu (2011) analyzed in a study and found that the NPL and inflation rate can be either direct or inverse. Rationally, when the inflation rate increases it will increase the borrower income. Thus the borrower's credit paying ability will be increased. On the other hand when the inflation rate raises the credit rate also shows a rising trend as mostly credits are being dispersed with floating rates. Logically this development negatively affects the loan paying ability of the borrowers. Hence, it is concluded that the relation between NPL and inflation rate is direct or inverse, totally depending on the situation. Our results conclude the same as there is a positive and significant relationship exists between inflation rate and NPL. OLS method shows an insignificant relationship while the fixed random and system GMM shows a significant and positive relationship.

Kemraj and Pasha (2009) also analyze a positive and significant relationship between exchange rate and NPL. Our result shows the same as OLS methods shows a positive and insignificant relationship. While the fixed effect and random effect show positive and significant relationship. The OLS method did not show significance level may be because of the problem of the endogeneity and autocorrelation. That is why system GMM was used and such regression problem were removed. That shows the true value between real exchange rate and NPL i-e positive and significance relationship.

A positive relation exists between unemployment and NPL in an economy (Nkusu, 2011, Vogiazas & Nikolaidou, 2011; Bofondi & Ropele, 2011; Berge & Boye, 2007; Rinaldi &Sanchis-Arellano, 2006; Gambera, 2000). Logically if a person is employed and has avail loan from a bank then he will repay the loan based on the savings he received from the salary. Suddenly if he loses his job, his ability to repay the loan may be reduced. As he may not be having other resources to repay that specific loan. Our results conclude the same and shows positive and significant relationship between NPL and unemployment.

A positive and significance relationship was observed between tax rate and unemployment (Albertazzi&Gambacorta,2006). Logically the high tax rate will reduce the ability of the borrower to save money for the operating activities and future investment goals. Thus, in order to receive finances for operating activities and future investments new loans need to be used by the borrowers, that increases the debt burden of the borrower and reduce its ability to pay his loan. Our results conclude a positive and significance relationship between NPL and tax rate.

The country level institutional environment with in which a banking system operates is very important determinant of the loan quality. Like most countries Pakistan has been taking steps in the right direction regarding improvement in the institutional level environment to improve the economic stability. Studies are being conducted to ascertain association between role of institutions and non performing loan (Breuer, 2006). The institutional environment includes legal and judicial framework, political stability, the degree of corruption control, government effectiveness, regulatory quality, voice and accountability (Kaufmann *et al.*, 2008). These factors appear to be important in term of affecting the levels of NPL.

In our results the control of corruption shows a strong negative and significance relationship with NPL. Jodlewski (2004) report a significant relationship between corruption and non-performing loan. Logically we can conclude that the higher level of corruption reduces the earning power of the borrower and increase the NPL levels.

Results report a strong and negative relationship between the government effectiveness and level of NPL. The more effective the government is, the better the policies will be instituted in terms of economic growth that covers both the micro level and macro level policy making by the government (Boudriga, Taktak & Jellouli, 2009). At the same time the lesser effective the government is the higher will be level of NPL i.e. government will influence the banking sector just for the sack of its own political manifesto completion (Khwaja & Mian, 2005).

In any country that has a democratic type of government the political stability is very important for the long term growth and financial stability of the country (Khwaja & Mian, 2005). Dinc (2005) argues that a negative relationship exists between non-performing loan and political stability, results also conclude the same negative and significant relationship between NPL and political stability. Kaufmann *et al.* (2008) argue about the importance of regulatory quality and rule of law that both these variables are very important for the institutional environment stability of a country. Moreover, its importance in terms of financial system viability is also very important because if the financial institution operating in a country, where there is no rule of law and the regulatory quality are not sound enough to safeguard the interest of the banks, then we must expect a failure in the near future. In Pakistani context the regulatory quality shows a negative and significance relationship with NPL. La porta *et al.* (2000) argue that strong regulatory law with in a country can have stronger corporate governance level that helps in providing investor protection but in our case the rule of law shows insignificance relationship which means that in Pakistani banking system

the rule of law that is being developed is not good enough to keep the non performing loan levels under check. Last but not the least voice and accountability shows a negative and significant relationship between NPL and non-performing loan that mean the stronger level of accountability the better will be the bank's position to keep the level of NPL within limits.

Future Research

Following areas may be looked at as for the future research.

- Corporate governance should be checked in terms of its impact of NPLs.
- A combined effect of both country level and company level institutional factors should be checked to see the overall combined effect on NPLs in banks in Pakistan.
- The time span can be increased to see its long term impact and its influence by different variables.

References

Adebola, S. S., &Yusoff, W. S. b., &Dahalan, DJ (2011). An ardl approach to the determinants of nonperforming Loans. *Kuwait Chapter of Arabian Journal of Business and Management Review*, *1*(2).

Berge, T.O., Boye, K.G., 2007. An analysis of bank's problem loans. *Norges Bank Economic Bulletin 78*, 65–76.

Bofondi, M. and Ropele, T. (2011). Macroeconomic determinants of bad loans: evidence from Italian banks. *Occasional Papers*, 89.

Boudriga Abdelkader ,Boulila T. Neila and JellouliSana (2009): Bank Specific, Business and Institutional, Environment Determinants of Nonperforming Loans: Evidence from MENA Countries, *Journal of Financial Economic Policy, 1*(4), 286-318

Dash, M., and Kabra, G. (2010). The determinants of non-performing assets in Indian commercial bank: An econometric study. *Middle Eastern Finance and Economics, 7*, 94-106.

DeYoung, Robert, and Gary Whalen. (1994). Is a consolidated banking industry a more efficient banking industry? *Office of the Comptroller of the Currency*,*13* (3).

Dinç, I. S. (2005). Politicians and banks: Political influences on government-owned banks in emerging markets. *Journal of financial economics, 77*(2), 453-479..

Drees, M. B., &Pazarbasioglu, C. (1998). *The Nordic banking crisis: pitfalls in financial liberalization* (No. 161). International monetary fund.

Fofack, H. (2005). Nonperforming loans in Sub-Saharan Africa: Causal analysis and macroeconomic implications (Working Paper No. 3769).*World Bank Policy Research.*

Gambera, M. (2000). *Simple forecasts of bank loan quality in the business cycle*. Chicago, IL: Federal Reserve Bank of Chicago.

Geletta, W. N. 2012. *Determinants of Non-performing Loans: The Case of Ethiopian Banks*, Unpublished Master's Thesis, University of South Africa.

Gonzalez-Hermosillo, B. (1999). *Determinants of ex-ante banking system distress: A macro-micro empirical exploration of some recent episodes.* International Monetary Fund

Gujarati,D.(2003). Basic Econometrics (4th ed.).NewYork:McGraw Hill Habib,S., Masood, H., H., Hassan, S.T., Mubin, M. &Baig, U.(2014). Operational risk management in corporate and banking sector of Pakistan. *Information and Knowledge Management, 4*(5), 58-66

Heffernan, S. (2005). *Modern banking*. John Wiley & Sons.

IMF. (2005). Implementation of Basel II - Implications for the World Bank and the IMF. *International Monetary Fund*. [Online] Available: http://www.imf.org

Jiménez, G., Salas, V., &Saurina, J. (2009). Organizational distance and use of collateral for business loans. *Journal of Banking & Finance*, *33*(2), 234-243.

Kaufmann, D., Kraay, A., &Mastruzzi, M. (2008). *The worldwide governance indicators project: Answering the critics* (Vol. 4149). World Bank Publications..

Keeton W. & C. S. Morris .(1987). Why Do Banks' Loan Losses Differ? *Federal Reserve Bank of Kansas City, Economic Review*, May, pp. 3-21.

Khan, F.,AhmedA.M., Lim, c. G.,&KhanH., (2011).Determinants of Bank Profitability in Pakistan: Case Study of Pakistani Banking Sector, *World Applied Sciences Journal, 15*(10):1484-1493, ISSN1818-4952.

Khemraj, T., & Pasha, S. (2009). The determinants of non-performing loans: an econometric case study of Guyana.

Khwaja, A. I., &Mian, A. (2005). Do lenders favor politically connected firms? Rent provision in an emerging financial market. *The Quarterly Journal of Economics, 120*(4), 1371-1411.

Louzis, D. P., Vouldis, A. T., & Metaxas, V. L. (2012). Macroeconomic and bank-specific determinants of non-performing loans in Greece: A comparative study of mortgage, business and consumer loan portfolios. *Journal of Banking & Finance*, *36*(4), 1012-1027.

Makri Vasiliki, Tsagkanos Athanasios and BellasAthanasios(2014): Determinants of Nonperforming Loans: The Case of Eurozone" *Panoeconomicus, Volume 2*, Pp. 193-206 Mileris

Nkusu, M. (2011). Nonperforming loans and macro financial vulnerabilities in advanced economies. IMF Working Papers, 1-27.

Petschnigg, R. (2005). *The institutional framework for financial market policy in the USA seen from an EU perspective* (No. 35). European Central Bank.

Rajan, R., & Dhal, S. C. (2003). Non-performing loans and terms of credit of public sector banks in India: An empirical assessment. *Occasional Papers*, *24*(3), 81-121.

Rajan, R., & Dhal, S. C. (2003). Non-performing loans and terms of credit of public sector banks in India: An empirical assessment. *Occasional Papers, 24*(3), 81-121.

Rinaldi, L., Sanchis-Arellano, A., 2006. Household Debt Sustainability: What Explains Household Non-performing Loans? An Empirical Analysis. *ECB Working Paper*.

Roodman, D. (2006, July). How to Do xtabond2. In *North American Stata Users' Group Meetings 2006* (No. 8). Stata Users Group.

Roodman, D. (2009). How to do xtabond2: An introduction to difference and system GMM in Stata. *The Stata Journal*, *9*(1), 86-136.

Roodman, D. (2009). A note on the theme of too many instruments. *Oxford Bulletin of Economics and statistics*, *71*(1), 135-158.

Salas, V. &Saurina, J. (2002). Credit risk in two institutional regimes: Spanish commercial and savings banks. *Journal of Financial Services Research, 22* (3), 203-224.

Sinkey, J. F. & Mary B. G. (1991). Loan-Loss Experience and Risk-Taking Behavior at Large Commercial Banks. *Journal of Financial Services Research, 5*, 43-59. Web Sources www.bloomberg.com

Sinkey, J. F. (1992). *Commercial bank financial management in the financial services industry*. Macmillan New York, NY.

State Bank of Pakistan, 2010. Annual Report 2009-10. Available at: http://www.sbp.org.pk/reports/annual/arFY10/MoneyBanking.pdf.

State Bank of Pakistan, 2016. Annual Report 2015-16. Available at: http://www.sbp.org.pk/reports/annual/arFY16/MoneyBanking.pdf.

World Bank, (2015). Annual Report 2011-15. Available at: http://databank.worldbank.org/data/home.aspx

Annex A (Table 1. Variables description)

Variables	Definition	Literature Justification
Non Performing Loan (NPL)	Non performing loans to total loans	Klein(2013), Nkusu (2011)
GDP Growth Rate	Annual percentage growth rate of GDP at market prices based on constant local currency.	Louzis et al. (2011), Rajan& Dhal (2003), Fofack (2005).
Inflation Rate	Inflation as measured by the consumer price index reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly.	Khemraj and Pasha, (2009), Nkusu (2011), Klein (2013)
Real Exchange Rate	Real effective exchange rate is the nominal effective exchange rate divided by a price deflator or index of costs.	Khemraj and Pasha, (2009), Fofack (2005).
Unemployment Rate	Unemployment refers to the share of the labor force and educated force that is without work but available for and seeking employment.	Nkusu (2011), Vogiazas&Nikolaidou (2011), Bofondi and Ropele, (2011)
Tax Rate	Total tax rate measures the amount of taxes and mandatory contributions payable by businesses after accounting for allowable deductions and exemptions as a share of commercial profits.	AlbertazziandGambacorta (2006), Khan*etal*., (2011)
Worldwide governance Index	A combined index developed by adding all the six indicators developed by Kauffman.	Kaufmann et al., (2008)
Control of corruption	Control of Corruption captures perceptions of the extent to which public power is exercised for private gain.	Kaufmann et al., (2008)
Government Effectiveness	Government Effectiveness captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.	Kaufmann et al., (2008)
Political Stability and Absence of Violence/Terrorism	Political Stability and Absence of Violence/Terrorism measures perceptions of the likelihood of political instability and/or politically-motivated violence, including terrorism.	Kaufmann et al., (2008)
Regulatory Quality	Regulatory Quality captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development.	Kaufmann et al., (2008)
Rule of Law	Rule of Law captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.	Kaufmann et al., (2008)
Voice and Accountability	Voice and Accountability captures perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media.	Kaufmann et al., (2008)

Annex B (Table 3. Correlation Analysis)

	NPL	GDP_GR~E	INFLAT	REER	TAXRATE	UNEMPL	WGI	CC	GE	PS	RQ	RL
GDP_GR~E	-0.131											
INFLAT	0.064	-0.351										
REER	0.1124	0.5335	-0.688									
TAXRATE	0.1474	0.3401	0.3199	-0.297								
UNEMPL	0.1531	0.4787	-0.094	0.4528	0.08							
WGI	-0.302	0.5821	-0.047	0.0743	0.5762	-0.08						
CC	-0.2361	0.6109	-0.429	0.4558	0.0015	-0.16	0.737					
GE	-0.3021	0.5821	-0.047	0.0743	0.5762	-0.08	0.656	0.7368				
PS	-0.2777	0.5866	0.0787	-0.034	0.3983	0.029	0.828	0.6313	0.8277			
RQ	-0.291	0.0667	0.4702	-0.369	0.5066	-0.38	0.767	0.3666	0.7665	0.5952		
RL	0.074	0.2563	-0.323	0.5458	-0.222	0.268	0.103	0.1316	0.1033	0.1699	-0.010	
VA	-0.1634	0.2062	-0.536	0.7266	-0.713	0.377	-0.24	0.2851	-0.242	-0.112	-0.516	0.5626

Annex C (Table 4 system GMM)

Dependent Variable	Non-performing loans (%)									
Macro Economic Factors	Variables name	Label	Model 1	Model 2	Model 3	Model4	Model 5	Model 6	Model 7	Model 8
	lag Dependent Variable	NPL	0.31***	0.49***	0.146***	0.145*	0.21***	0.24***	0.52***	0.908**
	GDP growth rate	GDP_GRRATE	-3.44***	-1.1607	-2.23***	-2.1***	-7.459*	-3.86***	-2.40***	-0.9104
	Inflation rate	INFLAT	0.021	0.087***	0.020***	0.07***	0.12***	0.069*	0.019	0.021
	Exchange rate	REER	12.04*	15.057**	18.891***	17.5***	19.53*	17.37***	12.93*	23.587*
	Unemployment rate	UNEMPL	30.79***	12.88***	15.393***	9.82***	48.78***	19.4***	25.8***	37.6***
	Tax rate	TAXRATE	3.006	7.99***	0.3913	7.90***	10.33*	6.088*	2.117	21.5***
Index	World Governance Index	WGI		-2.7***						
Country Level Governance Index	Control of Corruption	CC			-8.33***					
	Government Effectiveness	GE				-15.6***				
	Political Stability and Absence of Violence	PS					-15.99*			
	Regulatory Quality	RQ						-16.32**		
	Rule of Law	RL							-0.886	
	Voice and Accountability	VA								54.1***
Number of Observations			200	200	200	200	200	200	200	200
Number Of Groups			20	20	20	20	20	20	20	20
Number Of Instruments			19	13	15	15	17	17	14	18
Hansen Test P Value			0.227	0.152	0.099	0.38	0.15	0.144	0.135	0.066
A-B AR(1) Or M1 Test P-Values			0.138	0.087	0.215	0.474	0.218	0.17	0.189	0.293
A-B AR(2) Or M2 Test P-Values			0.583	0.688	0.772	0.674	0.614	0.672	0.531	0.828

***, **, * represents 1%, 5%, 10% level of significance, respectively

.