Determinants of Non Performing Loan

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ABSTRACT

This study aimed to ascertain determinants of nonperforming loans in Pakistan’s banking sector and to examine the behaviour of the relationship between these determinants and nonperforming loans. Quarterly data of 10 years starting from year 2002 to year 2011 took from official websites of State Bank of Pakistan and Pakistan Bureau of Statistics. To obtain the results regression analysis was applied with NPL to two macro-economic level factors exchange rate and inflation and two bank level factors lending to private sector and lending to agricultural sector by banks. Empirical results of regression showed that exchange rate and lending to private sector are statistically significant whereas contrary to our expectations inflation and lending to agricultural sector are statistically insignificant.

Key Words: Nonperforming loans, Bank, Exchange Rate, Lending to Agricultural Sector and Lending to Private Sector.

INTRODUCTION

It has widely been accepted that percentage or quantity of non-recovering of loans is often associated with banks less profitability. Generally speaking there may be two reasons for non-payment of loans; one is none capability to return and another may be unwillingness to return. Unwillingness to return the borrowed amount could be because of borrower's fraudulent attitude. Another reason which is none capability to repay can have several factors such as economic downfall, rising rate of inflation, increased liabilities, natural disasters and instability of financial structure of the country etc. Since the study is based on the domain of finance, therefore in this paper we discuss about the lateral reason i.e. Economic factors that cause increase in nonperforming loans.

BACKGROUND

Allen, F. and Carletti, E. (2008)1 write various roles have been played by banks in an economy. The number of roles defined by them includes bridging flow of funds between borrower and investor, allocating and monitoring these funds for ensuring proper usage, risk sharing in the economy by diversifying and smoothening fluctuations, another greater role is contributing to economy and providing opportunity to grow.

Banks carry out a significant job in economic cycle; for the process of deposit mobilization banks act like intermediaries. Through various campaigns they interact with lot of individual, groups & companies and invite them to make deposit against financial and other related benefits. This deposited amount is a crucial source of financial institutions that enables them to offer credit to all sectors of the economy.

With the accumulation of deposit money banks mobilize deposit by making finances and investing in various financial markets. There are various objectives of banks' lending or financing which involves majorly but not...
limited to provisioning of working capital through fruitful returns against that lending and financing, progress of industries due to funds movement towards productive factors and they all ultimately strengthen economic backbone. Following these objectives banks have been investing through various ways such as Running Finance, Cash Finance, Demand Finance, Consumer finance.

Consequently, various banks in Pakistan under the jurisdiction of a governing body i.e. State Bank of Pakistan provide financing to households, individuals and their small and large enterprises in order to meet their requirements. The banks have been stressed by State Bank of Pakistan for devising ingenious strategies to overcome the increased level of impaired and non-performing loans. Despite, efforts of respective banks, financial institutions and regulatory bodies the problem is still arisen.

**PROBLEM STATEMENT**

A well growing economy of any state is more often backed up by healthier banking industry. A healthier banking industry is inevitable by good governance of money investments / lending and off-course positive return on it. Otherwise, non-performing loans can affect the ability of banks to play their role in the development of the economy. Study of other country's banking sector shows that profitability of banking industry has been affected due to non recovery or slow recovery of their loans since various years. Kenya's many financial institutions were collapsed due to non-performing loans. In the same way, one of the greater threat for banks/financial institutions of Pakistan is ever increasing non-performing loans. Monetary authorities must take it as challenge. If non-performing loans left uncontrolled in next few years it may harm the banking sector of Pakistan and that will ultimately a cause of economic distress. Therefore problems should be addressed in order to reform not only banking industry but also the overall economy.

**OBJECTIVES OF THE STUDY**

1. To find out the macro-economic and bank's level determinants of non-performing loans.

2. To determine the bank's related factors and macro-economic related factors, which cause increase in non-performing loans.

**RESEARCH QUESTION**

1. What are the determinants of non-performing loans in Pakistan's banking sector?

2. What factors cause increase in non-performing loan in Pakistan's banking sector?

**SCOPE OF THE STUDY**

Since Pakistan is a developing country and there is a need of such institutions who help in poverty alleviation by financial means, and Banks/ Financial Institutions are the entities which play an important role for such purpose. Therefore, this study contributes for banks/financial institution to set their strategic direction to improve their efficiencies in the area of recovery of their credit. This study revolves around economic factors of Pakistan during last decade which led increase in unsettled borrowed amount and its affect on Banks.

**LIMITATIONS OF THE STUDY**

Profitability or performance of banking sector of Pakistan does not only depend on increase or decrease of non-performing loans. There may be number of factors that affect on bank's performance and/or its profitability which shall be having greater influence then NPL or these factors may be having equal or less influence which may vary on case to case basis. But in this paper, we are discussing only non-performing loans of Pakistan and that will ultimately a cause of economic distress. Therefore problems should be addressed in order to reform not only banking industry but also the overall economy.

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2 Joseph (2012)
3 Dash and Kabra (2010), Greenidge and Grosvenor (2010)
4 Waweru and Kalani (2009)
loans.

Another limitation of this study is that variation of non-performing loans may also have multidimensional reasons. These multidimensional reasons may include but not limited to behavioral factor of borrower, false or misleading information provided by loan applicant, erroneous decisions of banks at the time of allowing loan agreement, inappropriate strategies or lack of compatible strategies at the time of making loan agreement as well as at the time of recovering loan amount.

**LITERATURE REVIEW**

Profitability of Pakistani Banking sector is being hampered by rising non-performing loans. There are various reasons behind this alarming rise. As per perception of Pakistani bankers primarily high interest rates, upward trend of inflation, increasing exchange rate, lowering GDP, energy crises and unemployment are the reasons of increase in NPLs (Farhan et al., 2012). The occurrence of non-payment finds everywhere. But private and agricultural sectors seem affected most.

Unfortunately, business activities in Pakistan's economy have been injured badly due to ever rising threat of terrorism and terrible condition of law and order. These situations lead to slow down of economy. And off-course the recovery front of banking sector is also not saved. It has also been hindered badly due to these factors.

The consumer financing bubble which has got an immense hike previously, now it has been burst due to consumer default rates got immense hike. Since, various studies indicate the lesser profitability of banks is caused by non-performing loans. Therefore, the resolving measures should be taken.

As per the parameter set by regulatory body; “any loan either in default or close to being default come in the category of non-performing loan”. More clearly it can be explained as “the quantity of borrowed money for which pre-scheduled payments/installments has not been made for at least 90 days by the borrower, (this is also depends on the contract terms between borrower and lender)”. In case, the borrower again starts making payment on such non-performing loan then it becomes a re-performing loan. Re-performing of loan can be possible either by agreeing payments on same payment patterns or by rescheduling of installments.

The value of net non-performing loans can be calculated by subtracting provision of loan losses from non-performing loans. Prudential Regulations (PRs)5 enforced and keeps amended from time to time by State Bank of Pakistan. As per current Prudential Regulations (SBP, 2011, p. 7), Board of Directors approved policy for rescheduling or restructuring of loans shall be framed to mitigate the problem. Prudential Regulations defines that rescheduling does not change the status of non-performing loans unless the 10% of rescheduled loan or 6 installments as per terms and conditions of newly scheduled loans have been made by borrower. Once the loan rescheduled and within one year if the borrower defaults again i.e. reaches to 90 days past due, then the loans is classified in one of the two; one is previous category that was prior to rescheduling i.e. “non-performing loan” the second category is “loss”. If the loan was unsecured then it is classified as loss, and if it was secured by any collateral then it is classified as non-performing loan.

**EMPIRICAL STUDY**

Farhan et al. (2012) determine a perception of Pakistani Bankers upon economic determinants of non-performing loans in Pakistan since 2006. It is declared that this is a first study that utilizes

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5 Prudential Regulations for Consumer Finance (last updated Jan 2011) issued by State Bank of Pakistan
primary data collection to determine non-performing loans in Pakistan's banking sector. Data collection is done through well structured questioner with the help of 201 numbers of bankers who belong to top 10 Pakistani banks. These top ten banks possess 72% market share as far as size of NPL is concerned these top ten banks possess 56.54% of total NPLs of Pakistani banks. The 201 respondents are connected in credit risk analysis or lending decisions or handling portfolio of non-performing loans. Correlation and regression analysis are performed to check impact of independent variables upon dependent variables. Where independent variables are interest rate, inflation unemployment, growth of GDP, exchange rate and energy crises and dependent variable is NPL. Empirical result on Pakistani banker’s perception shows that growth of GDP has a significant inverse relationship with NPL, whereas interest rate, inflation unemployment, exchange rate and energy crises have significant positive relationship with NPL. The conclusion reveals that energy crises lead to harm industries production and unemployment leads to decreasing the demand of products offered by many firms, therefore these factors ultimately leads to rise in NPL of large industries and small medium enterprises as well. Similarly unemployment itself badly affects the NPL of consumer financing sector.

Haneef et al. (2012) study the practices of risk management in banking sector of Pakistan and their impact on non-performing loans and bank’s profitability. They use secondary type of data pertaining to five well known banks of the country. In order to study risk management being practiced in these banks, variation in NPL and bank profitability is checked by using bar and pie chart analysis. Study results demonstrate that banking sector of Pakistan is not practicing the risk management, as it should be. And non-performing loans have upward trend due to this reason and it is threatening for bank’s profitability. It is suggested that banks can avoid NPLs by following the methods suggested by SBP.

Ijaz et al. (2012) study impact of banks privatization on non-performing loan in commercial conventional banks of Pakistan. To check pre-privatization and post-privatization performance data was analyzed through graphical and analytical tools. It is evaluated that lowered performance of banks, lack of lending plans, inappropriate credit operations and other similar kinds of factors lead to privatization of MCB, ABL, UBL and HBL Banks. Privatization was started from 1988 and after privatization these banks show noticeable improvement. Efficiency of these banks was improved and number of non performing loans significantly falls after privatization due to restructuring of the banks. This restructuring is based on corporate governance, loan portfolio management, early risk assessment, regular monitoring and other similar factor which was missing in pre-privatized banks.

Ahmed et al. (2011) examine specific factors of firm’s level and their affect on risk management practices followed by Islamic banks operating in Pakistan. They use financial data pertains to six Islamic Banks for the period from year 2006 to 2009. They employ the approach of regression analysis on dependant variables i.e. debt to assets ratio, capital to asset ratio and return on total assets as proxies of credit risk, liquidity risk and operational risk respectively. Result shows that bank’s size and financial risk are positively related with each other, whereas the size of the banks has negative and insignificant relation with operational risk. Empirical results of the study also show that NPLs and debt equity ratios have a positive relationship with credit risk, whereas both of them are negatively related with liquidity risk and operational risk. Capital adequacy has a significant negative relationship with operational risk and credit risk.
Joseph et al. (2012) designs a case study to find out the reasons of non-performing loans in Zimbabwe. The study is based on a largest commercial bank of Zimbabwe named as “CBZ Bank Ltd”. Primary data was collected through structured questionnaire and interviewing employees that have been involved in credit management and corporate lending for five years at least. Senior managers involved in lending decision were also interviewed. And secondary type of data was obtained from financial statement that are published and audited. Success rate of questionnaire responses (93.3%) and interview responses (57.1%) computed through excel; whereas frequency and weightage of all responses computed through SPSS. Results show that due to adoption of multicurrency in 2009 there is a rising trend in NPL. During the review period this rising trend is characterized with accumulation of loan to manufacturing and agricultural sectors and agricultural sector has been performing badly due to climate changes and high cost associated with farming in Zimbabwe. It is also find that NPLs have negatively affected the bank’s performance in terms of profitability and liquidity. It is assumed that these results can be generalized to all other banks of Zimbabwe, therefore all Zimbabwe’s banks suggested to concentrate on well performing sectors and avoiding these two sectors which have already reported a large NPL.

Fadare (2011) determines the factors of non-performing loans and tries to develop a composite indicator of financial crises in Nigeria. Fadare uses the data of Nigerian Banks for the period 1985 to 2009 and apply regression approach on that data step wise. The study shows that increase in NPL resulted due to decrease of per capita GDP, real GDP growth and reduction of interest rate spread. It also explores that decline in liquidity ratio, equity index, market risk premium and financial deepening also cause rise in non-performing loans. Where, “The term financial deepening refers to improvement/increase in the pool of financial services to all the levels in the society. More precisely “increase in the ratio of money supply to GDP or other price index”. The increase in credit to general economy, general price level and foreign exchange reserves result in increased non-performing loans. It is concluded that increase in liquidity ratio increases the probability of financial crises in tandem.

Nkamnebe and Idemobi (2011) investigate the factors among micro-finance institutions that cause the poor recovery of the credit disbursed under United Nations Development Program in Anambra State Nigeria. With the help of questionnaire they collect data of 97 from 129 micro-finance institutions of the state to assess the staff related factors. By applying descriptive analysis, study findings show that low credit recovery by MFIs is due to multi-dimensional factors. These factors are summarized as borrower’s wrong attitude for credit repayment, weak skills of MFI’s staff, their corrupt tendency to deal with borrowers, it also include a government factor i.e. poor infrastructural provision. All these factors directly affect the genuine efforts for alleviating poverty through micro credit in Nigeria. To deal with the problem of low credit recovery, result suggests the strategic change at the end of micro-finance institutions so they could be able to support the program of eradicating poverty from the state.

Thiagarajan et al. (2011) perform an empirical study to predict the credit risk determinants in commercial banking sector of India. By applying an econometric model on panel data of banks level including 22 banks of public sector and 15 banks of private sector, result shows that the lagged nonperforming assets had a strong and statistically significant positive influence on the current non-performing assets. The study explores that GDP has significant inverse relationship with credit risk for both sector
banks i.e. private and public. It is concluded that prudent credit policies must be adopted by Indian commercial banks to avert any ill affect of the credit risk. The GDP growth in the Indian economy is helping the banking sector in having their Non-Performing loans at an acceptable level. The study predicts boom in credit and NPA growth with a two year lag period between them, therefore it is suggested for the coming year that banking sector must be vigilant in managing the NPAs.

Akhtar et al. (2011) examine the banks specific factors that influence the profitability of conventional banks by applying multivariate regression analysis on the data set of year 2006 to year 2009 pertains to conventional banks of Pakistan. As per their study, return on assets and return on equity are the profitability determinants which can be used to measure the bank's performance, therefore they use separate model for return on asset and return on equity. In both models it is found that NPLs ratio, gearing ratio and asset management have significant affect on the commercial banks’ profitability. When return on assets is employed as a proxy to measure profitability of bank then the bank's size is a significant indicator of bank profitability; whereas, an insignificant relationship find when return on equity is used as a proxy for measuring profitability of banks. This study reveals that the effectiveness of the banking system and the excellence of the services being offered by them can be extended by implementing number of driving factors. The actions needed to be taken at the end of policy makers, bank management and practitioners for enhancing banks’ competence.

Khan et al. (2011) study the main determinants of bank profitability in Pakistani banking sector. Fixed effect model and random effect model are applied on the data taken from the year 2000 to 2010. Taking 16 banks into account the impacts of banks specific variables are examined. These banks specific variable include net profit as dependent variable whilst independent variables are non-performing loans, bank size, net interest margin, loan growth, insider lending, taxation, non-interest earning, overhead expenses, operating expenses, profit to asset ratio, return on asset ratio and deposit to asset ratio. The results disclose that deposit to asset ratio, loan to asset ratio, return on asset, growth of loans, net interest margin, tax, and non-performing loans significantly impact the bank's profitability but large banks are managing their non-performing loans efficiently than those of small banks.

Dash and Kabra (2010) explore non-performing loan determinants in Indian banking sector by using panel data set of 10 years from FY 1998-1999 to FY 2008-2009. Regression result shows that non-performing loans level reported by Indian commercial banks is positively associated with real effective exchange rate. They also explores that whenever domestic economy goes through deterioration in international competitiveness or in other words when there is appreciation in real effective exchange rate this results into increase in non-performing loans. Another finding i.e. NPLs significant inverse relationship with GDP, indicates that NPLs decreases due to real economy's strong performance. However, empirical results demonstrate that in Indian banking sector inflation is not an important determinant of NPLs. It is suggested that for evaluating the repayment ability of the borrowers of key export oriented sector, international competitiveness of domestic economy shall be considered by banks. It is also suggested to lending institutions that before extending loans the performance of real economy should also be taken into consideration because during the period of economic downturn loans delinquencies are more likely to be higher.

They use quarterly data from the financial sector of Barbados. This quarterly data is spanned over the years from 1996 to 2008. Forecasting of non-performing loans in Barbados banking sector is established by using a multivariate ARDL (Autoregressive Distributive Lag) model for banks at the aggregate level as well as at the individual level. For comparing the results, they additionally apply Random Walk Model as a benchmark. The variables used in this evaluation are NPL ratio, weighted average loan rate in the banking system (as a proxy of interest rate upon loan), consumer price index, real GDP, size of the bank i.e. banks relative market share, growth in loan on an annual basis. Wherein weighted average loan rate, consumer price index and real GDP are macroeconomic factors and size of the bank and annual growth rate of loans are bank-specific factors. Results draw that macroeconomic factors such as consumer price index, weighted average loan rate and real GDP influence on NPL ratio and they have predictive power for loan default. It is also found that variables specific to banks such as banks size and growth in total loans have also reasonable significant impact on NPLs. Therefore, it is concluded that these macroeconomic variables and bank-specific variables give better results in the horizon of forecasting NPLs at the aggregate level, whereas for individual banks, these variables are more likely better only for longer periods of prediction. It is recommended that forecasting of NPL should be done by using multivariate models that include both macroeconomic and bank-specific variables. For commercial banks, it is also recommended that real economy should be paid attention while providing loans. For bank’s regulator, it is recommended to take measures and implement them so that bank could maintain conservative credits standards and adequate provisions.

Khemraj and Pasha (2009) examine the determinants of non-performing loans by using a fixed data set spanning over 10 years (starting from 1994 to 2004). It is an econometric case study of the banking sector of Guyana which employs fixed effect regression model with OLS (ordinary least squares). The regression model comprises banks’ specific factors such as real interest rate, bank size, growth in loan, and macro factors i.e. inflation, gross domestic product, and real effective exchange rate. Considering international indicators, finding shows that real effective exchange rate has a positive significant association with non-performing loans, and it indicates that non-performing loans of commercial banks likely will show upward trend with the appreciation in the local currency. Another finding shows that growth in GDP has an inverse relationship with non-performing loans which suggests that lower non-performing loans are translated with the improvement in the real economy. Empirical results also show that the banks who excessively lend against relatively higher lending interest rate are likely to gain upwards trend in non-performing loans. However, empirical result does not support that screening of loan customers is more effectively done by large banks compared to the small banks of Guyana.

Waweru and Kalani (2009) investigate the failure of loan recoveries from 1986 causing the collapse of many commercial banks operating in Kenya. By taking a sample of 30 managers of 10 largest banks, the study finds the main reasons of non-performing loans involve an external factor i.e. national economic downturn which eventually leads to depression in businesses. An internal factor of banks specific comprises that lack of staff skills to assess credit risk and borrower credibility during the loan process as well as debt collection policy in banks is not aggressive. Some factors which are out of banks’ managers control categorized as general factors and comprises on customer failure of disclosing vital information in the process of loan application. Another contributing factor identified pertains to legal issues that lead to delay in commercial
dispute settling.

The region where banks operate matters the most for Indian context, where banks are obliged to enter and operate in difficult regions and also need to remain stressed in the recommended environment of banking reform. It is suggested that regional impact could be more transparently evidently in case the non-performing assets reported as state or region wise instead of national average as per the practice being followed.

THEORETICAL MODEL OF THE STUDY

METHODOLOGY
Quantitative Research Approach
As the study is roaming around facts, figures and statistics of dependent and various independent variables therefore it was recommended to apply quantitative research approach to obtain the result. It was a descriptive study which provides relationship between variables. This research used a regression analysis to check the relationship between variables.

DATA SOURCE
Panel data set spanned over 10 years starting from year 2002 to 2011 was used, which is secondary type of data collected from Hand Book of Statistics and official websites of State Bank of Pakistan and Pakistan Bureau of Statistics.

STATISTICAL TECHNIQUE
Ordinary least square regression analysis was applied because we have to check dependency of non-performing loans on some macro economic variables and some banks level variables. This analysis explains how a dependent variable changes with the change in an independent variable at the same time keeping other independent variables constant.

HYPOTHESIS
(i) H01: ER has insignificant impact on NPL ratio
  Ha1: ER has significant impact on NPL ratio
(ii) H02: INFL has insignificant impact on NPL ratio
  Ha2: INFL has significant impact on NPL ratio
(iii) H03: L_Pvt has insignificant impact on NPL ratio
  Ha3: L_Pvt has significant impact on NPL ratio
(iv) H04: L_Ag has insignificant impact on NPL ratio
  Ha4: L_Ag has significant impact on NPL ratio

RESEARCH MODEL
Since knowing about determinants of NPL in Pakistan is the objective, therefore NPL is now a dependent variable and on the basis of above study here we are assuming that NPL depends upon inflation rate, exchange rate, loans disbursement to agricultural sector, loans disbursement to private sector and therefore:

Regression model can be expressed as:
\[ NPL = a + \beta_1(ER) + \beta_2(INFL) + \beta_3(L_{Pvt}) + \beta_4(L_{Ag}) + \epsilon \]
Where, 
NPL= Non-Performing Loans, INFL = Rate of Inflation, ER = Exchange Rate, L_Pvt = Lending to Private Sector, L_Ag = Lending to Agricultural Sector, \( \beta_1 \) = Coefficient of Exchange Rate, \( \beta_2 \) = Coefficient of Rate of Inflation Rate, \( \beta_3 \) = Coefficient of Lending to Private Sector, \( \beta_4 \) = Coefficient of Lending to Agricultural Sector, “\( \alpha \)” denotes Regression Constant & “\( \varepsilon \)” symbolizes Error.

**VARIABLE DESCRIPTION**

**Non Performing Loan**
According to loan classification of State Bank of Pakistan, a loan is considered as non performing loans upon which pre-scheduled payment has been due for at least 90 days. Published data of non-performing loans of Scheduled Banks in billions was taken for every quarter from year 2002 to 2011. The amount was in Pak rupee.

Scheduled Banks\(^6\) means all Commercial Banks and Specialized Banks (e.g. Industrial Development Bank of Pakistan, Zarai Taraqiati Bank Ltd. etc) maintained under sub-section 37(2) of the State Bank of Pakistan Act, 1956.

**EXCHANGE RATE**
Exchange rate defines the value of one country’s currency in terms of another country's currency. Since US dollar is one from the major currencies traded at international level so the values of 1 USD dollar in PKR were taken for every quarter. Exchange rate represents the economic soundness of Pakistan at international level. Exchange rate is a macro-economic variable.

**INFLATION**
Consumer price index (CPI) is an indicator of inflation because it measures change in price level of consumer goods purchased by households. The higher and lower inflation rate can affect the borrower’s repayment capability. It is also considered as macro-economic variable.

Quarterly average values of CPI in Pakistan for measuring change in inflation were used.

**LENDING TO PRIVATE SECTOR**
Quarterly ended positions of aggregate lending made by scheduled banks to private sector were taken in PKR billions. As it is banks discretion that how much to invest by them in private sector therefore it is considered as bank's specific variable. Here private sector includes private sector enterprises as well as consumer loans such as personal loan, auto loan house loan etc.

**LENDING TO AGRICULTURAL SECTOR**
Quarter ended positions of aggregate lending made by banks to agricultural sector were taken in PKR billions. Since banks decide that how much amount to be invested by them in agricultural sector therefore it is considered as banks specific variable.

**SUMMARY STATISTICS FOR NPL MODEL**
Below mentioned table will provide the descriptive statistics of all the variables used in Non Performing Loan model.

<table>
<thead>
<tr>
<th></th>
<th>Log(NPL)</th>
<th>ER</th>
<th>INFL</th>
<th>L_PVT</th>
<th>L_Ag</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>309.09</td>
<td>67.98</td>
<td>160.53</td>
<td>1,777.73</td>
<td>144.25</td>
</tr>
<tr>
<td>Maximum</td>
<td>629.56</td>
<td>87.81</td>
<td>262.04</td>
<td>2,617.12</td>
<td>187.75</td>
</tr>
<tr>
<td>Minimum</td>
<td>107.02</td>
<td>57.24</td>
<td>103.73</td>
<td>595.17</td>
<td>99.59</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>144.12</td>
<td>11.66</td>
<td>51.21</td>
<td>731.55</td>
<td>26.09</td>
</tr>
<tr>
<td>Observations</td>
<td>40.00</td>
<td>40.00</td>
<td>40.00</td>
<td>40.00</td>
<td>40.00</td>
</tr>
</tbody>
</table>

A statistical tool descriptive statistics is applied on the complete set of data to sum up and get the basic properties of panel data set.

The first variable is Non-Performing Loan in billion Pak rupees. This has a maximum value of 629.56 and minimum value 107.02, provided that the natural log of NPL was also taken which represents the vast increase in NPL during the period from 2002 to 2011. Total numbers of observations in summary table are 40, which show that there is no missing value.
The second variable is Exchange Rate (ER) which has a maximum value in PKR 87.81 and minimum value 57.24. The difference of maximum and minimum value of exchange rate represents that the value of Pak rupee against a single US dollar decreased rapidly during 2002 to 2011. Total numbers of observations of exchange rate in above table are 40, which show that there is no missing value of exchange rate.

The third variable is Inflation (INFL) which has a maximum value of consumer price index 262.04 and minimum value of consumer price index 103.73. This shows the increasing trend of inflation in Pakistan over the period 2002 to 2011. Total number of observations 40 show that there is no missing value of inflation.

The fourth variable in our model is total lending to Private Sector by banks (L_Pvt) in billions Pak rupees. The maximum value of lending to private sector is 2,617.12 and minimum value 595.17, which represent the increasing trend in lending to private sector by banks. Number of observation 40 shows that there is no missing value of this variable.

The fifth variable is loan disbursement to Agricultural Sector by banks (L_Ag) which has a maximum value PKR 187.75 billion and minimum value PKR 99.59 billion. Since there is also an increasing trend of lending to agricultural sector but this increasing trend is slower then increasing trend of lending to private sector. Number of observation 40 shows that there is no missing value of the fifth variable.

### Parameter Estimates for NPL Model

**Table 4.3.1**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>3.6204</td>
<td>6.7852</td>
<td>0.0000</td>
</tr>
<tr>
<td>ER</td>
<td>0.0212</td>
<td>2.3426</td>
<td>0.0250</td>
</tr>
<tr>
<td>INFL</td>
<td>0.0057</td>
<td>1.8914</td>
<td>0.0669</td>
</tr>
<tr>
<td>L_PVT</td>
<td>-0.0003</td>
<td>-2.4382</td>
<td>0.0200</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>L_AG</th>
<th></th>
<th>Adjusted R2</th>
<th>0.8668</th>
<th>D. W. Stats</th>
<th>2.0481</th>
<th>F-statistic</th>
<th>64.4346 (0.000)</th>
</tr>
</thead>
</table>

Source: Author’s estimation

The above Table 4.3.1 represents Constant, Exchange Rate, Inflation, Lending to Agricultural Sector and Lending to Private Sector.

Adjusted R square explains the accuracy in the change of Non Performing Loans that is defined by Exchange Rate, Inflation, Lending to Agricultural Sector and Lending to Private Sector. In this model the value of adjusted R-Square is 0.8668; which represents that Exchange Rate, Inflation, Lending to Agricultural Sector and Lending to Private Sector can be estimated by 86.68% of the variance in growth of non-performing loan. It identify that we have a good model explaining about 86.68% of the variance in NPL growth of Pakistan. After Adjusted R-Squared table shows the Durbin Watson stat, Durbin Watson explained the auto-correlation. It should be equal or less than 2 and in our results Durbin Watson is 2.0 which specify that there is no autocorrelation in our selected variables.

Probability of F-Statistic is use to represent the significance of the model. If the Probability value of F-Statistic is less than 0.05 then it explains that Exchange Rate, Inflation, Lending to Agricultural Sector and Lending to Private Sector are considering good to predict the changing value of non-performing loan and hence the null hypothesis is rejected. Whereas if we find the probability of F-Statistic value is greater than 0.05 then it explain that Exchange Rate, Inflation, Lending to Agricultural Sector and Lending to Private Sector are not considering good to predict the changing value of non-performing loan in Pakistan and the null hypothesis is accepted. In the above model F-Statistic is 64.43 and the probability of F-Statistic is 0.00 i.e. less than 0.05 which
identify that all the independent variables are considered good to predict the changing in dependent variable.

The constant value also termed as Y intercept having value 3.62, which shows the height of regression line when it touches the Y-axis. It is the estimated value or projected value of Non Performing Loans where all the repressors are assumed at “0” (zero).

The coefficient of Exchange Rate is 0.021 which means every unit increase in exchange rate increases non-performing loan by 0.021 units where other variables remain constant. Probability value 0.02 i.e. less than 0.05 which shows that there is significant relationship between exchange rate and NPL. The coefficient of Inflation is having value 0.0057 which represents that quantity of non-performing loans increases by 0.0057 units when inflation increases by a single unit at the same time other variables held constant but probability value is 0.06 which is greater than 0.05 which shows that there is insignificant relationship between inflation and NPL. The coefficient of Lending to Private Sector is having value -0.0003 which represents that decrease in non-performing is forecasted by 0.0003 units with every unit increase in Lending to Private Sector where other variables remain constant. Probability value 0.02 indicates significant relationship between banks lending to private sector and their NPLs. The coefficient of Lending to Agricultural Sector is having value 0.0011 which represents that quantity of non-performing increases by 0.0011 units with every unit increase in Lending to Agricultural Sector where other variables remain constant but probability value 0.81 indicates insignificant relationship between banks lending to agricultural sector and their NPLs.

CONCLUSION AND RECOMMENDATIONS

CONCLUSION

This study was attempted to ascertain the determinants of non-performing loans in Pakistani banking sector with the help of panel dataset collected from “Data Warehouse and Statistics Department” of State Bank of Pakistan and other sources (discussed above) comprising on years 2002 to 2011. Empirical results obtained from Regression Model support the assumption that exchange rate and loan disbursement to private sector significantly impact on level of non performing loans in Pakistan's banking sector. Since, appreciation in exchange rate represents deterioration of Pak economy in international economy. This translates that when domestic economy feels downward trend in international competitiveness then it ultimately leads worsening borrowers’ repayment capability (specifically export oriented sector) as exchange rate fluctuation adversely affects on export demand found by Mustafa and Nishat (2004). The findings of exchange rate and NPLs are alike Dash and Kabra (2010) who stated that whenever there is deterioration in the international competitiveness of the domestic economy it gives higher level of NPLs to Indian commercial banks. Waweru and Kalani (2009) also concluded in their study that unfavorable economic environment was perceived in Kenya as the most important external factor of increase in NPL. Other similar findings presented by Greenidge and Grosvenor (2010) while forecasting NPLs in Barbados.

The second good predictor of our regression model explains that loan disbursement to private sector decreases NPLs slightly the reason being quality of loan disbursement and recovery practices have been improved in terms that banks seem to follow more aggressive credit

risk-averse practices. As per 8SBP’s Annual Report 2010 – 2011, “from 2008 consumer financing continued to decline due to mounting NPLs of consumer loan and banks have been conservative in lending to this risky business segment specifically in the presence of other risk free opportunity of investing in Government papers (Government sector investment), so the private sector borrowing categories showing persistence increase in infected loans at the same time declining in the new loans disbursement to private sector”

Other two variables inflation and loan disbursement to agricultural sector exert that whenever there’s increase in inflation it transmit rise in NPL and same thing happens when loan disbursement to agricultural sector increases. However, contrary to expectations these two variables are not good predictors of change in levels of non-performing loans. Apart from positive effect of inflation and alike Dash and Kabra (2010), Khemraj T. & Pasha S. (2009), inflation have no statistically significant relation with NPL. Loan disbursement to agricultural sector by banks also has statistically insignificant relation with the variation in level of non performing loans the reason being banks seem least attractive towards investments in agricultural sector.

RECOMMENDATION
- Internationals competitiveness of Pak economy should be taken into account by Banks while making lending decision specifically to export oriented sector.
- Increasing inflation trend adversely affect borrowers’ repayment capability therefore while analyzing borrower’s repayment capability making installments/re-payment schedules country’s internal and external economic conditions should be taken into account.
- Avoid lending to private and agricultural sector means avoid catering the requirement of internal economy and it does not serve the purpose behind bank’s mobilization of savings. 9Dr. Ishrat Hussain (2005) wrote that middle class which is a backbone of economy was not getting due attention but Banks of Pakistan have been catering the need of Government and serving few large corporation as well. In this scenario it is needed banks shall not avoid lending to private and agricultural sector but to device ingenious strategies for analyzing applicant’s repayment capabilities keeping in view all internal and external economic conditions as well as recovery alternatives.
- State Bank of Pakistan shall enhance its monitoring for loan making decisions and their recovery procedures followed by banks so that banks shall evade impairing of loans and enjoy lending to the backbone of the economy rather discourage lending.

FUTURE RECOMMENDATION
- It is recommended that research should be done with other macroeconomic variables such as foreign exchange reserves.
- It is recommended that behavior of borrowers and defaulters should also be studied across Pakistan with the qualitative research techniques.
- Social and political factors affecting NPL should also be studied.
- Bank strategies for lending and recovering and their impact shall also be analyzed by using quantitative and qualitative research techniques.

9 Dr. Ishrat Husain (Governor of the State Bank of Pakistan - January 2005). Article Name: Banking Sector Reforms in Pakistan, “Blue Chip - The Business People’s Magazine”.
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WEB LINKS:
www.sbp.org.pk – Official website of State Bank of Pakistan