

Assessing Banks Internal Factors as Determinants of Non-Performing Loans: Evidence from Pakistani Commercial Banks

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Abstract

Non-Performing Loan (NPL) has been crucial factor these days in terms of Banking sector sustainability and profitability. This paper intends to assess factors that may influence the rising level of nonperforming loans in commercial banks of Pakistan. The study uses Size, Return on Assets, Earning per Share, Cash to Total Asset, and investment to Total Asset, Capital Adequacy Ratio and Breakup value per share as determinants of nonperforming loans as banks internal factors. Panel data from 2006-2016 was taken from published annual reports and State Bank of Pakistan data base. Descriptive Statistics, correlation analysis and random effect panel least square regression was used to analyze data through STATA application software. The analysis leads to the conclusion that reduced level of nonperforming loans leads to increased banks performance. It was also concluded that Return on Asset, Earning per share, Capital adequacy ratio and Breakup value per share has got a significant impact on non-performing loans.

Keywords: Scheduled commercial banks, Determinants, Nonperforming loans (NPL), Bank internal factors, Panel data models.

Introduction

In every economy financial institutions has got a major role to play. Every developed and sound financial institution has got the ability to absorb economic jolts and keep the economic system on track (Aburime, 2009). In that respect every country's central bank has got a major role to play in form of keeping the financial system on track, so that the consistent economic sustainability can be achieved. However, a few difficulties are faced by the central banks of different countries. The responsibility of the central bank is to regulate financial system and institutions, while financial institutions which report to central bank have the responsibility of implementing the regulations and policies set by the central bank. Commercial banks receive deposits from the customer, and then lends, it in shape of credit. Commercial banks earning spread comes

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from the difference between the bank lending rate of return and the depositors rate of deposit. Normally, the bank receives high returns on the advances than it gives to its depositors for their deposits. This difference between lending rate and deposit rate is called earning spread and are actually earning of a bank. At times banks do not receive returns on their advances. This breakage in returns from advances is being termed as non-performing loans. Moreover, it imbalances the process of banks as it becomes difficult for banks to repay to their depositors. Thus this problem spreads to the whole financial system and ultimately weakens financial system to failure. That's why the high level of nonperforming loans are worthy to be considered as tool that measures the sustainability of the financial institutions (Saba, Kouser and Azeem, 2012).

Non-Performing loan (NPL)

Every countries Central bank has defined NPL as per their own set of economic conditions. According to Basel committee (2001)NPLs is being defined as loans that are not being paid or overdue 90 days or more either in shape of principle amount or markup. (IMF, 2005).

Alton and Hazen (2001) defined non-performing loans as advances that are not being repaid for a specified period of time. Hennie (2003) termed NPLs that are not generating profits. Caprio and Klingebiel (1996), supports the argument that those loans that do not generate profit for a longer period of time either principal or interest. Michael et al (2006) argues that Non-performing loans affect the overall performance of the banks that in turn threatens the solvency of the banks. The rising level of NPLs can drastically effect the overall performance of banks (DeYoung & Whalen, 1994; Saba et.al., 2012). For example Sinkey and Greewalt (1991) find that the developed country such as USA had rising level of NPL that cause banks failure. Fofack (2005) argued that in African countries the source of economic crises was the rising level of NPLs in banks. The higher rates of NPLs increases the credit risk within a country. Hess, Grimes and Holmes (2008) argued on the main sources of NPLs in Australia by collecting data from 32 different banks for a period 1980-2005. They analyze different determinants that can cause serious threats to the rise of level of NPLs in the country. Developing countries even shows a worst scenario then the developed countries. For example Dash and Kobra (2012) examine the relationship between NPLs with macroeconomic and bank specific variables. The results concluded that those banks that had a high aptitude to take risk have a high level of NPLs.

Even in Pakistan the situation is not that much different. The State bank of Pakistan has developed proper policies and prudential regulations but for the last 20 years the level NPLs has not fallen to a

satisfying level (SBP, 2013). According to World Bank (2015), the average NPL ratio for Pakistan banks was 14.87% between 1997-2016, with minimum of 7.3%, in 2006 and maximum of 23.4%, in 2001. Pakistan has 24th position among the list of high NPL countries among 119 countries. Pakistan once was ranked as high as 7th in 2008.

Why this NPL is high as a developing country. Thus such a scenario requires an in-depth research in case of developing countries such as Pakistan to identify the factors that are present in macro, micro environment, and Institutional factors. According to the State bank of Pakistan (2013), the total non-performing loan for all banks of Pakistan is Rs.585 billion out of NPLs 69% account for the balance sheet of private sector banks and 27 % is from public sector banks. Prior literature on the determinants of NPLs is scarce. Individual studies report different determinants of high NPLs in both developed and developing countries. Moreover these studies overlap in presenting NPLs determinants, sample period and also in some cases in research modeling. Specifically the results for developing countries are inconsistent. Therefore, the objective of this research to investigate determinants of NPLs from the perspective of a developing country using a whole range of banks internal factor from the period 2006-2016.

Research Question

What are the Banks Internal factors that greatly influence the non-performing loans?

Review of Literature

This section reviews prior literature in NPLs. In section 2.1 define NPL, section 2. 2 describes in detail determinants of NPLs.

Definition of NPL

The definition is not specific to any country vary from country to country. The Basel committee (2001) defined NPL as the loans are not paid for 90 days or more after the maturity date (IMF, 2005). SBP (2010) has classified loans in different categories. Explanation is given below:

- i). Substandard: If the interest or principle amount is overdue by 90 days and more then it will categorized as substandard loan. A provision of 25% will be done from the books of the banks as non-performing loan.
- ii). Doubtful: A loan will be termed as Doubtful loan, when due installment of loan is overdue by 180 days and more then as per SBP prudential regulations the bank will do 50% provisioning of that outstanding amount as NPL.
- iii). Loss: A loan will be termed as Loss, when due installment is overdue by 1 year and more then as per SBP prudential

regulations the bank will do 100% provisioning of that outstanding loan as NPL.

In general, business cycle within a country determines how the NPL model can be prepared by the banks and financial institutions in that country. Modeling of NPL highlights the country cyclical nature of credit risk and business failures (Williamson, 1987). Keeton and Morris (1987) were the early pioneer, who did work on non-performing loan, they actually compared the net charge off rate with loan losses within a country. They also find out that the lower pay back rate is because of macroeconomic condition prevailing within a region.

NPLs has no direct impact on economic crises but is contributor in it (Drees & Pazrbasioglu 1998; Kaminsky & Reinhart 1999). Brownbridge (1998) argues that the main cause of bank failures is the increased ratio of NPLs. If proper action is not taken in this regard, assets of bank will not be able to generate revenue for the banks. Adebola, Wan Yousaff and Dahalan (2011) argues that non-performing loans has worse impact on the economy of a country as seen in the case of US. Moreover it is important for the countries to identify the factors affecting NPL. Saba et al. (2012) argued that it is evitable to study NPLs, it can lead to economic crises in shape of low per capita income and reduced profits. The next section discusses determinants of NPLs in detail in different context.

Determinants of Non-Performing Loans

Dash and Kabra (2010) argue that Microeconomic variables has a strong impact of the rising level of NPLs. Hu et al. (2004) explain that size of bank has a negative relation with NPLs. They report that state owned bank has lower level of NPLs.

Godlewski (2004) investigate that a relationship exists between Return on asset (ROA) and NPLs. The lower the return on asset the higher will be the NPLs and vice versa. While Ahmed and Bashir (2013) reported a positive relationship between Return on asset and NPLs. Moreover, Boudriga et al, (2009) report a negative relation exist between ROA and NPL and argue that when return on asset decreases then the banks starts to indulge in more riskier investment that rises the level of NPLs. Moreover, Makri et al. (2014) show a negative relationship between Return on equity and non-performing loan.

Capital adequacy ratio represents the ability of an organization to stand in front of abnormal losses. (Habtamu, 2012). Makri et al.(2014), elaborate that capital adequacy ratio shows the strength and stability of any organization in time of crises. Makri et al.(2014) argue that a negative relation exist between NPL and capital adequacy, when riskier advances are targeted by the banks, then capital adequacy and NPLs tend

to have a negative association. On the other hand Djiogap and Ngomsi (2012) report a positive relationship between capital adequacy and non-performing loan.

Makri et al. (2014) argued that loan to deposit ratio represents the ratio of amount that is given or advanced as loan out of deposits. The higher the ratio of loan to deposit ratio the higher will be the risk of the bank in rising level of NPL and vice versa (Ranjan and Chandra, 2003). Quagliariello (2007) investigates in their research that ROA and ROE has significant impact on the NPL. Moreover a positive relation exists between rapid growth of loans and NPLs (Keeton, 1999 and Fries et al., 2002).

Data and Methodology

Data

In this study we investigate how banks internal factors affect NPL in Pakistan. We consider a sample of 20 banks from Pakistan for the year 2006-2016. The data is being gathered from banks annual reports, State bank of Pakistan database. A sample of 20 banks were selected to ensure the homogeneity of data, all the selected banks were commercial. The selection criterion was not based on Islamic and investment banks. This led to a total of 20 commercial banks operating in Pakistan from a period 2006 till 2016. All those banks neglected that either started after 2006 or stopped operations before 2016. Merged banks were also not included in the sample to induce homogeneity in the data.

Methodology

The main objective of the present study is to find the impact of banks internal factors on non performing loans of banks in Pakistan. According to the State Bank of Pakistan (SBP) in Pakistan, we have 27 registered commercial banks out them 20 commercial banks were selected based the criteria mentioned in data section 3.1.

Variables Used

Based on the available literature the following variables were identified as NPL proxies, the description of these variables are given the Table 1.

Table 1: Variables description

Variables	Definition	Sources
Non-Performing Loan (NPL)	Nonperforming loans to total loans	Bank data from SBP
Size	Natural logarithm of total assets	Bank data from SBP
Return on asset	Net profit after tax to total	Bank data from

(ROA)	assets	SBP
Earning Per Share (EPS)	net profit after tax to number of shares outstanding	Bank data from SBP
Liquidity position (LP)	Cash and balance with bank to total asset	Bank data from SBP
Investment position(IP)	Total investment to total asset	Bank data from SBP
Capital Adequacy Ratio(CAR)	Total shareholders' equity to total Assets	Bank data from SBP
Breakup Value Per Share (BVPS)	Total shareholders' equity to total ordinary shares	Bank data from SBP

Empirical Model

The following empirical model is used to assess the banks internal factors as determinants of NPL.

$$NPL_{it} = \alpha + \beta_1 ROA_t + \beta_2 Size_t + \beta_3 EPS_t + \beta_4 LP_t + \beta_5 IP_t + \beta_6 CAR_t + \beta_7 BVPS_t + \epsilon_{it}$$

Where:

NPL=Non Performing Loan

ROA=Return on Assets

Size= log of total Asset

EPS=Earnings per Share

LP=Liquidity Position

IP=Investment Position

CAR=Capital Adequacy Ratio

BVPS=Breakup Value per Share

Results and Data Analysis

The data obtained were analyzed using Descriptive statistics, correlation and panel multiple regression analysis.

Descriptive Statistics

Table 2: Correlation matrix for banks

Variable	Obs	Mean	Std. Dev.	Min	Max
NPL	220	10.15641	8.487209	0	51.56
Size	220	19.21727	1.289818	15.21	21.64
ROA	220	-0.0802568	1.889169	-7.824046	8.931816
EPS	220	5.330227	7.427134	-19.02	24.47
CashtoTA	220	2.216906	0.3700316	1.363537	3.357245
CAR	220	2.124348	0.5728713	-1.469676	3.901771
InvesttoTA	220	34.40545	13.10493	6.2	68.61
Breakupval~e	220	30.00895	28.0686	-13.45	115.06

The Table 2 shows the descriptive statistics of the variables that include both independent variable and dependent variables that includes a total of 220 observations per variable used. NPL ratio shows that the minimum value is zero and maximum is 50, so it means that the standard deviation is high that is 8.47. Size minimum value is 15.21 while maximum is 21.64 and the standard deviation is low at 1.29 and mean is 19.21. ROA minimum value is -7.82 while maximum is 8.932 and standard deviation is 1.88 that is low. The mean for ROA is -0.08. EPS minimum value is -19.02 while maximum value is 24.47 while standard deviation is 7.42 that is high while mean is 5.33. Cash toTA minimum value is 1.36 while maximum value is 3.357, so standard deviation is low that is 0.37 and mean is 2.21. CAR minimum value is -1.47 while maximum value is 3.9, so the standard deviation is not so high that is 0.57. The mean of CAR is 2.12. The Invest to TA minimum value is 6.2 while maximum value is 68.61, so the standard deviation 13.10 that is high. The mean for Invest to TA is 34.4. The minimum value for Breakup value per share is -13.4 while the maximum value is 115.06, so the standard deviation is 28.06 that is high. The mean value is 30.089.

Correlation Matrix

Table 3: Correlation matrix for banks

Variables	NPL	Size	ROA	EPS	LR	IR	CAR	BVPS
Non Performing Loan (NPL)	1							
Size	0.0819	1						
Return on asset (ROA)	-0.0707	0.3337	1					
Earning Per Share (EPS)	-0.2605	0.5856	0.4082	1				
Liquidity Risk (LR)	-0.3163	-0.2066	0.0372	0.1263	1			
Investment Risk(IR)	0.1459	0.3231	0.1454	0.2197	-0.4808	1		
Capital Adequacy Ratio(CAR)	-0.0071	-0.4134	-0.0759	-0.0189	0.1152	-0.1142	1	
Breakup Value Per Share (BVPS)	-0.1697	0.5927	0.4056	0.5163	0.1555	0.2035	-0.0175	1

The correlation matrix in Table 3 represent all the dependent and independent variables and there relation with one another. It can be easily gauged through the relationship shown in the correlation matrix that all independent variable has got less than .80 level of correlation with the other independent variables as suggested by Gujarati (2003). Therefore we can say that we may have no problem of multicollinearity in our results.

Heteroscedasticity Statistics

Breusch-Pagan / Cook-Weisberg test for heteroscedasticity

Ho: Constant variance

Variables: fitted values of npl to advances

chi2(1) = 0.44

Prob > chi2 = 0.50

The main purpose of this test is check that the data are homogenous and we don't have heterogeneity problem. The above test clearly suggests no problem of heteroscedasticity in our data as the result of 0.5077 is clearly above the level of significance that is probability of 0.05. Breusch-Pagan test is used to find the consistency in variance.

Multicollinearity Statistics

Table 4: Multicollinearity Statistics

Variables	VIF	1/VIF
Size	2.45	0.408051
Return on asset (ROA)	1.23	0.813511
Earnings Per Share (EPS)	4.45	0.155052
Liquidity Risk (LR)	1.58	0.634721
Investment Risk(IR)	1.47	0.6804
Capital Adequacy Ratio(CAR)	1.35	0.739269
Breakup Value Per Share (BVPS)	4.76	0.147957

Table 4 clearly shows that we have no problem of multicollinearity, as all the variables VIF value is less than 10, that is below the minimum threshold value. The standard value of VIF must be $0.05 < VIF < 5$ (O'Brien, 2007). All the variables fulfill this criteria that shows no multicollinearity in our independent variables.

Regression Results

The regression technique that is being used in this study are fixed and random effects panel least square. The basic purpose of using this technique is that the panel data has got the properties of both cross section and times series. This analysis technique has got the properties of both intertemporal change and individuality of entities being examined (Fox, 1997). The results of panel regression test is discussed here.

Fixed Affect Panel Least Square:

Table 5: Fixed Affect Panel Least Square

Variables	Coefficients	St. errors	T-Values	P> t
Size	1.199985	1.171128	1.02	0.307
Return on asset (ROA)	-0.37394	0.229773	-1.63	0.095

Earning Per Share (EPS)	-0.48388	0.128581	-3.76	0
Liquidity Position (LP)	0.098519	1.8787	0.05	0.958
Investment Position(IP)	-0.82856	1.235667	-0.67	0.503
Capital Adequacy Ratio(CAR)	-0.06282	0.045197	-1.39	0.096
Breakup Value Per Share (BVPS)	0.116254	0.04505	2.58	0.011
Cons	-11.3309	25.38882	-0.45	0.656
R-sq:	= 0.2472			

The Table 5 shows dependent variable NPL that is being regressed by the independent variables like size, ROA, EPS, LR, IR, CAR, and BVPS of commercial banks to find its impact using Fixed Effect Panel Least Square Method. The R-square value is 24.72%. Size has a positive relation with NPL but it is statistically insignificant. ROA has a negative relation with NPL, it is statistically significant but at level 10%. Earnings per share has also a negative relation with NPL and it is statistically significant at level 5%. Liquidity ratio has positive while Investment ratio has a negative relation with NPL but both are statistically insignificant. CAR has negative relation with NPL but it is significant at level 10%. Breakup value share has a positive relation with NPL and it is statistically significant at level 5%.

Random effect Panel Least Square

Table 6: Random Effect Panel Least Square

Variables	Coefficients	St. errors	T-Values	P> t
Size	1.889128	0.771068	2.45	0.014
Return on asset (ROA)	-0.24674	0.23253	-1.06	0.289
Earning Per Share (EPS)	-0.51427	0.131479	-3.91	0
Liquidity Risk (LR)	-0.99003	1.660037	-0.6	0.551
Investment Risk(IR)	0.239071	1.076235	0.22	0.824
Capital Adequacy Ratio(CAR)	-0.0039	0.041417	-0.09	0.925
Breakup Value Per Share (BVPS)	0.073464	0.039959	1.84	0.066
Cons	-24.5203	17.12806	-1.43	0.152
R-sq:	= 0.2302			

The Table 6 shows dependent variable NPL that is being regressed by the independent variables like size, ROA, EPS, LR, IR, CAR, and BVPS of commercial banks to find its impact using Random Effect Panel Least Square Method. The R-square value is 23.02%. Size has a positive relation with NPL but it is statistically significant. ROA has a negative relation with NPL, it is statistically insignificant. Earnings per share have also a negative relation with NPL and it is statistically significant at level 5%. Liquidity ratio has negative while Investment ratio has a positive relation with NPL but both are statistically insignificant. CAR has negative relation with NPL but it is statistically insignificant. Breakup

value share has a positive relation with NPL and it is statistically significant at level 5%.

Hausman Test

Table 7. Hausman Test

Variables	Coefficient			
	Fixed	Random	Difference	S.E
Size	1.199985	1.889128	-0.68914	0.881473
Return on asset (ROA)	-0.37394	-0.24674	-0.1272	
Earning Per Share (EPS)	-0.48388	-0.51427	0.030386	
Liquidity Risk (LR)	0.098519	-0.99003	1.088553	0.879652
Investment Risk (IR)	-0.82856	0.239071	-1.06763	0.607118
Capital Adequacy Ratio (CAR)	-0.06282	-0.0039	-0.05892	0.018095
Breakup Value Per Share (BVPS)	0.116254	0.073464	0.04279	0.020803

chi2 = 1.45

Prob > chi2 = 0.9841

Hausman Test was applied to select between fixed effect least square model and Random Effect Least square model. The Null: hypothesis was Fixed and Alternate: hypothesis was Random effect. As the p-value was 0.9841 so random effect least square model was selected as preferred model.

Conclusion

So we can conclude that Non performing loans are the most crucial problem faced by the banking sector in Pakistan. In every economy banking sector plays a very vital role as it considered the veins of the body in a country. That's why commercial banks should concentrate on Capital adequacy ratio, Earning per Share, size and Breakup value per share as determinant of Nonperforming loans in banks. That's why the mechanism should improve in terms of loan assessment procedures, so that quality of loans can be produced to reduce the level of NPLs in the banking sector of Pakistan.

As from the analysis it can be seen that Capital adequacy ratio should be maintained and improved as it has got a significant impact on NPL. Therefore commercial banks should maintain the minimum regulatory requirement for the reduction in the level of NPL. The commercial banks should focus on the quality of loans so that the NPL level is reduced.

The negative relation between the return on asset and NPL shows that the profitability of banks is strongly affected by the increasing level of NPL. The history has shown the non-performing loans level has increased because of many reasons. At times political influence on the banking sector of banks and at times the wrong decisions of the

management by investing in wrong financial products. Nationalization Act 1974 is also on such act that impact banks in many aspects.

The shareholders has got a great say in any organization. They play a vital role the organizational development in shape of investment in the banks and also at the same time using their voting power in making big decisions regarding companies coming future. So are that purpose the Earning per share ratio is very important for them, so that they can have an eye on the overall performance of the bank. The higher level earning per share shows that the bank is earning high and the level of NPL is reduced. Earnings per share has got a negative relation with the non-performing loans. The results show a strong relation with earning per share. It can also be depicted by another variable breakup value per share. As it also shows a strong relationship with non-performing loans. At the end we may conclude that the application of a strong regulatory environment, control of the administrators and regulators can play a vital role in the reduction of the level of nonperforming loans in banks. State bank has always played a key role in it and needs further improvement to reduce its level in the banking sector.

Future Research Avenues

The following areas can be sought for further discussion on this topic:

- Further study can be conducted to elaborate other variables as determinants of nonperforming loans.
- The dataset can be increased to get more in depth analysis.
- More variables can be included like macroeconomic, institutional factors
- Cross cultural impact can also be checked.

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