Determinants of Non-Performing Loans of Banks: Empirical Evidence from Private Sector Commercial Banks of Pakistan

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Abstract

Banking sector plays a significant role in the economic development of the country and the non-performing loans has remained an intractable challenge which is denounced everywhere as the scourge of the present times. The study uses the, Asset Quality, Return on Assets, Deposit to Total Asset, Cash to Total Asset, Size, Return on Equity, Capital Adequacy Ratio and Net interest margin as bank specific factors. The panel data since 2007 to 2019 has been collected from the annual reports of banks and State Bank of Pakistan database. Descriptive statistics, correlation analysis, fixed effect panel, least square regression and error correction mechanics test were applied to analyze the data. It was also concluded that Asset Quality, Deposit to Total Assets, Cash to Total Assets, Return on Equity, Capital Adequacy Ratio and Net Interest Margin have negative and significant effect on non-performing loans while the Size has insignificant and positive correlation with the non-performing loans. This study is therefore a narrative in pursuit of a normative vision for NPL free society.

Keywords: non-performing loans, leturn on equity, return on assets

Introduction

The significant role of banking sector in the economic development of the country is because of the fact that it provides one of the essential inputs, namely, finance for the growth of various segments of the economy. The safety of the financial resources is definitely one of the major constraints in the developing economies like ours for accelerating the pace of economic growth, the effective and receptive banking system is utmost important (Arora, 2010).

The importance of bank performance both in national and international economies is demonstrated by the global financial crisis of 2007-2008 (Olweny&Shipo, 2011). The bank facilities and loans are equally beneficial but the banks also suffer the risk of loss when the loans become non-performing and this discourage further lending and affect the profitability of the banks. The non-performing loans are the byproducts of performing loans (Guarda, Rouabah, &Vardanyan, 2013).

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Non-Performing Loans (NPLs)

There is no global definition to define NPLs at practical level. The variations occur in term of scope, content and classification of loans. According to the International Monetary Fund (IMF) definition, a loan is considered to be non-performing if payments (principal and/or interest) due have not been paid for at least 90 days (IMF, 2004). A loan whose payment schedule is overdue for more than 90 days is called non-performing loan (Rose *et al*., 2010). In Pakistan, since 1997, in order to manage the burden of NPLs the central bank of the country has been following a multi-pronged policy. The major steps include clear guidelines for the classification of NPLs and provisions required there against. The State Bank of Pakistan (SBP) has issued prudential regulations in 1992 to put in place a prudent regulatory framework. The purpose was to ensure the safety and soundness of the financial system. A part from this other objective criterion was defined for the definition and classification of non-performing loans.

According to the circular issued by SBP (2010) has defined the following three categories for the classification of non-performing loans.

1) Substandard: If the interest or principle amount is overdue by 90 days and more then it will be categorized as substandard loan. A provision of 25% will be booked from the books of the banks as non-performing loan.
2) Doubtful: When due installment of loan is overdue by 180 days and more, the bank will do 50% provisioning of that outstanding amount as NPL.
3) Loss: A loan will be termed as Loss, when due installment is overdue by 1 year. As per SBP prudential regulations the bank will do 100% provisioning of that outstanding loan as NPL.

The study conducted by Kithinji (2010) shows that the raising level of non- performing loan results in high loan provisioning which, leads to decrease in profits for many banks. The raising level of NPLs minimizes the banking sector ability to play its role in the economic development (Zaini*et al*, 2010).

The world development indicators show the level of NPLs being highest in Pakistan as compared to other Asian Countries (World Bank, 2013). The State Bank of Pakistan (SBP) has been issuing guidelines from time to time regarding the classification and writing-off the irrecoverable loans. According to SBP (2010) non-performing loans are defined *as **loans** and advances whose mark-up/interest or principal is overdue by 90 days or more from the due date.* The State Bank of Pakistan is dealing in comprehensive manner with the issue

of NPL by (a) improving the coverage and reporting procedure. (b) adopting proactive treatment regarding the existing stock of NPLs (c) restricting flow of new NPLs and (d) improving the existing policy and regulatory environment of the banking sector (Hussain,2002).

In Pakistan according to the data furnished by the SBP, NPL ratio increased rapidly between 2005 to2010. The NPLs ratio in 2005 was 6.7% as against 14.3% in 2010. The data reached an all-time high 16.7 % in Sep, 2011 and a record low 7.1 % in Jun, 2007. The NPLs figure in banking sector stood at Rs 776.10 billion in December, 2019 as compared to Rs 694.4 billion in December, 2018 showing an increase of Rs 81.7 billion.

Problem Statement

Globally, there is unanimous consensus that the commercial banks in a country are critical for providing financial services to the economic units as well as offering loans to borrowers, but at the same time the non-performing loans are the mass critical phenomena adversely affecting banking sector because the interest income a major source of bank profitability and is dependent upon non- performing loans. There are many external and internal factors concerning non-performing loans. This research study is an attempt to investigate the internal determinants of NPLs from the perspective of the banking sector in Pakistan.

Objective of the study

The main objective of this study is to investigate the internal determinants of non-performing loans in the banking sector of Pakistan.

Scope of the Study

The well-functioning banking system is significantly important for the economic growth. Raising level of NPLs is impeding the profitability of the banks and discourages further lending. Therefore, the study seeks to fill the gap by providing the full information about the internal factors of NPLs and how these NPLs adversely affect the profitability of the five largest private sector commercial banks in Pakistan Vis: Habib Bank Limited, Muslim Commercial Bank, United Bank Limited, Allied Bank Limited and Bank Alfalah covering the period from 2007 to 2019.

Literature Review

Kithinji (2010) investigated that the raising level of non-performing loan results in high loan provisioning which, leads to

decrease in profits for many banks. The NPL minimizes the banking sector ability to play its role in the economic development (Zaini*et al*, 2010).The study conducted by Boudriga *et al*. (2010a) confirmed that there is a negative association between ROA and NPLs. Durafe and Singh (2016) deployed multiple regression analysis and showed that bank specific variables have significant effect on NPLs.

The quality of asset in the bank is associated with the quality of loans and this can be measured by the non-performing loans. The studies of Matthew (2015) and Hashem (2016) are the examples of the negative relationship between asset quality and NPLs.Ranjan and Chandra, (2003) observes the inverse relationship between deposit to total assets and NPLs. Another study ofKunt and Detragiache (1998) shows inverse negative relationship between cash to total assets and NPLs.

The empirical findings of the studies relating to the impact of bank size on NPLs investigated an inverse relationship (Rajan and Dhal, 2003; Hu *et al*, 2006). According to these studies, as compared to the smaller banks the larger banks have a better technology and risk management strategies, which allow them effective information gathering, processing and analyzing which finish up with lower levels of NPLs as compared to smaller banks.

The study conducted by Makri (2015) shows a negative relationship between return on equity and NPLs. According to Barus and Erics(2017),capital adequacy ratio accommodate the risk of losses that may be faced by the banks. The results of the research study conducted by Astrini*et al*. (2014) shows that CAR has a significant and negative impact on banking institutions listed on IDX.Another study conducted by Fofack (2005) shows insignificant and inverse relationship between net interest margin and NPL.

Methodology

The primary objective of this research study is to analyze the impact and correlation among the given variables. This study employs panel data of five private sector commercial banks operating in Pakistan since 2007 to 2019 era. The data was obtained from the annual reports of banks and State Bank of Pakistan database.

Variables Detail

Based on the literature review, the following variables were identified as NPL proxies; the summary is presented in following table.

Table 1 Description of Variables and their Expected Relationship

SNO	Variables	Measure	Notation	Source

1	Non-performing loans	Natural log of Non-performing loans to Total loans	LNPL	SBP (2019)
2	Asset quality	Natural log of Net income to Total average assets	LAQ	SBP
3	Deposit to total assets	Natural log of Total Deposit to Total assets	LDTA	SBP
4	Cash to total assets	Natural log of Cash and balances with other banks to Total assets	LCTA	SBP
5	Size	Natural log of Total assets	LSIZE	SBP
6	Return on equity	Net profit after tax to Total shareholders 'equity	ROE	SBP
7	Capital adequacy ratio	Total shareholders' equity to Total risk weightage assets	CAR	SBP
8	Net interest margin	Total interest income-Total interest expense/ Total assets	NIM	SBP

Model Specification

The following empirical model is used to assess the bank specific factors as determinants of NPLs

$$LNPL_{it} = \beta_0 + \beta_1 LAQ_{it} + \beta_2 LDTA_{it} + \beta_3 LCTA_{it} + \beta_4 LSIZE_{it} + \beta_5 ROE_{it} + \beta_6 CAR_{it} + \beta_7 NIM_{it} + \varepsilon_{ii} \quad \ldots\ldots\ldots\ldots (1)$$

Analysis and Findings

The data obtained were studied using Descriptive statistics, correlation and panel multiple regression analysis, the findings is discussed in the following section.

Table 2: Review of Descriptive Statistics

Variables	Obs	Mean	Std. Dev.	Min	Max	Skewness
LNPL	65	10.317	0.580	9.280	11.409	0.284
LAQ	65	11.621	0.490	10.676	12.421	-0.290
LDTA	65	11.815	0.377	11.036	12.355	-0.403
LCTA	65	11.663	0.407	10.999	12.262	-0.116
LSIZE	65	12.326	0.465	11.308	13.029	-0.443
ROE	65	45.386	6.114	11.920	50.740	-1.359
CAR	65	15.219	2.947	10.260	22.250	0.573
NIM	65	4.172	1.083	2.700	6.640	0.754

It can be seen from above table 2 that minimum, maximum, mean and standard deviation were used to show the overall trend of the data. LNPL minimum value is 9.280 while maximum is 11.409 and the standard deviation is low at 0.580 and mean is 10.317.LAQ

minimum value is 10.676 while maximum is 12.421 and the standard deviation is low at 0.490 and mean is 11.621. The minimum value for LDTA is 11.036 while the maximum value is 12.355, so the standard deviation is 0.377 that is low. The mean value is 11.815. LCTA minimum value is 10.999 while maximum value is 12.262, so the standard deviation is not so high that is 0.407. The mean of LCTA is 11.663.

The mean for LSIZE is 12.3257, minimum value is 11.308 while maximum value is 13.029 and standard deviation is 0.4645 that is low. The minimum value for ROE is 11.920 and the maximum value is 50.74. The standard deviation and mean is 6.114 and 45.386 respectively both are on the high side. The mean of CAR is 15.218 with a minimum of 10.260 and a maximum of 22.250, while the standard deviation is 2.947. In addition, the mean of NIM is 4.172 with a minimum of 2.70 and a maximum of 6.64. The standard deviation for NIM is 1.083. The skewness for all variables lies between +1.96 to-1.96, which means that the data tends to be normal.

Correlation Matrix Table 3 Correlation Matrix for Banks

Variables	LNPL	LAQ	LDTA	LCTA	LSIZE	ROE	CAR	NIM
LNPL	1							
LAQ	-0.199	1						
LDTA	-0.603	-0.442	1					
LCTA	-0.601	-0.417	-0.577	1				
LSIZE	0.569	0.417	0.494	0.469	1			
ROE	-0.169	-0.151	-0.106	-0.021	0.111	1		
CAR	-0.106	-0.357	-0.067	-0.045	-0.078	-0.115	1	
NIM	-0.158	-0.078	-0.391	-0.397	-0.385	-0.099	-0.335	1

A correlation was computed to check the relationship that existed between dependent independent variables. The results show a strong negative correlation exists between non-performing loans and LAQ, LDTA, LCTA, ROE, CAR and NIM, while the relationship between NPL and LSIZE is positive.

Regression Analysis

Table 4 Fixed Effect Panel Regression Analysis

Variable	Coefficient	Std. Error	t-Statistic	Prob.

LAQ	-0.1591	0.1197	-4.935	0. 0000
LDTA	-1.9054	0.9072	2.1004	0.0405
LCTA	-0.2348	0.3852	-0.6095	0.5448
LSIZE	0.9685	0.6273	-1.544	0.1285
ROE	-0.0133	0.0064	2.0739	0.0043
CAR	-0.0633	0.016	3.9579	0.0002
NIM	-0.1591	0.0435	-3.6621	0.0006
C	8.4451	2.3056	3.6628	0.0006
R-squared	0.8643			
Adjusted R-squared	0.8361			
F-statistic	30.676			
Prob(F-statistic)	0.0000			

The fixed effect regression technique results are shown in table 4. All the independent variables are regressed with the dependent variable (NPLs). The coefficient of the independent variables LAQ, LDTA, LCTA, ROE, CAR and NIM are negative and statistically significant at 5% level of confidence. The coefficients of these variables are -0.1591, -1.9054, -0.2348, -0.0133, -0.0633, and -0.1591respectively. The negative sign of the coefficient estimate indicates the existence of strong inverse relationship between NPLs and the independent variables. Thus, it can be concluded that, an increase in these variables lead to a decrease in NPLs of private commercial banks operating in Pakistan. In addition, size of a bank has a positive and statistically insignificant relationship with NPLs.

The R^2 and the adjusted- R^2 statistics of the model are 86.43% and 83.61% respectively. The value of R^2 shows that 86.43% of the variation in the dependent variable (NPLs) is explained by the changes in the independent variables. The remaining 13.57% of the change in NPLs is explained by other variables which are not included in the econometric model used in this study. These results are intended to show how well does the model containing the explanatory variables that can explain variations in the dependent variable and usually known as goodness of fit statistics (Brooks, 2008). F-statistics is used as the overall test of significance. The null hypothesis of F-statistics that is R^2 equal to zero was rejected at the 5% level of significance (p-value =0.0), which further enhance the validity and reliability of the model.

Error Correction Mechanism Test

Table 5 Short run Coefficient and ECM

Variable	Coefficient	Std. Error	t-Statistic	Prob.

D(LAQ)	-8448.96	3270.93	-2.583048	0.0130
D(LDTA)	-86865.73	15998.55	5.429601	0.0001
D(CTA)	-24371.10	0.047923	-2.192159	0.0335
D(LSIZE)	58740.88	12479.44	-4.707014	0.7324
D(ROE)	-24348.11	139.8894	0.343955	0.0061
D(CAR)	-11271.69	359.7733	3.534709	0.0009
D(NIM)	-14193.41	1038.776	-1.148867	0.0256
ECM	-0.5172	0.081894	6.315017	0.0001
C	2031.348	684.4355	2.967918	0.0047
R-squared0.635636				
Adjusted R-squared0.572268				

The ECM model was run to include both short and long run relationship. The result of ECM is presented in table 5 which shows that there is both short and long run equilibrium in the system. The coefficient of the independent variables LAQ, LDTA, LCTA, ROE, CAR and NIM are negative and statistically significant at 5% level of confidence. The coefficients of these variables are 8448.96, 86865.73, 24371.10, 24348.11, 11271.69 and 14193.41 respectively. The negative sign of the coefficient estimate indicates the existence of strong inverse relationship between NPLs and the independent variables. The Size has a positive and statistically insignificant relationship with NPLs.

The coefficient of one period lag residual coefficient is negative and significant which represent the long run equilibrium. The coefficient is -0.517 meaning that system corrects its previous period disequilibrium at a speed of 51.7% annually.

Conclusion

The lending function by banks has long been accepted as one of the significant tools that support the success of development project and in this way performs their role in the economic development of the country. Deterioration the loan portfolio of banks in terms of quality was the main cause of rising non-performing loans. The study finds loss of prudence and loss of wealth due to increasing non-performing loans being one of the causes. The NPLs has been a critical phenomenon over the world level started from the USA in 1980, where retail banking suffered due to the growing trend of price rising. In Pakistan NPLs are created by the banks and to prove that we used panel data for the period of 2007 to 2019 to analyze the bank internal determinants of NPLs.

From the analysis it transpires that factors such as asset quality, deposit to total assets, cash to total assets, return on equity, capital adequacy ratio and net interest margin have got significant

impact on NPL. However, the size of the banks has got a positive relation with the non-performing loans.

The results of this study leave several implications for researchers, practitioners and regulators. The statistics show that more than 86 % of variation in non-performing loans is directly influenced by the banks' specific determinants which are within the control of the bank. The bank management needs to closely check and control these variables. The banking sector is very busy industry; therefore, regulator should device regulations and monitoring tools that will trigger early warning signals of bank loss due to increasing level of NPLs.

There is no system in place to restore equilibrium in the banks 'business cycle through adjustment, by disposal of stuck up loans backlog retrospectively as it has created financial morbidity for the banks and their profitability. Banks should be aligned with accountability process, in order to recover NPLs. Banks internal systems need to be revamped. Only after retrospective equilibrium has been restored, they should sanction loan for the future. Finally, non-performing loan is abhorrent and banks cannot survive for long under present circumstances, therefore monetary and regulatory authorities should take steps accordingly.

Recommendations

From the study the following recommendations can be made for the future research

- The variables used in the econometrics model did not include all factors that can affect NPLs of Pakistan commercial banks. Thus, future research could include more internal and external factors.
- There is also an opportunity to study the determinants of NPLs for Islamic and Foreign Banks in Pakistan to find out if the same results would be achieved.

References

Arora, H. (2010). Effect of Size and Age on the Performance of Indian Banks Under Different Ownership Forms. *IU Journal of Bank Management, 9*.

Astrini, I, W.S., and I, K.S. (2014).Pengaruh CAR, LDR, dan Bank Size terhadap NPL pada Lembaga Perbankan Yang Thereafter Di Bursa Efek Indonesia.*E-Journal Bisma Universitas Pendidi Ganesha Jurusan Manajemen Volume 2.*

Barus, A. C. (2017). Analisis Faktor-Faktor Yang Mempengaruhi Non-Performing Loan pada Bank Umum di

Indonesia. *Jurnal Wira Ekonomi Mikroskil: JWEM*, *6*(2), 113-122.

Bhattarai, Y. R. (2016). Effect of non-performing loan on the profitability of commercial banks in Nepal. *Prestige International Journal of Management and Research*, 1-9.

Boudriga, A., Taktak, N.B. and Jellouli, S. (2010a), "Bank specific, business and institutional environment determinants of banks nonperforming loans: evidence from menacountries", *Economic Research Forum, Working Paper*, pp. *1-28*.

Brooks, C 2008, Introductory Econometrics for Finance, 2nd edn,*Cambridge University Press, New York Daily Dawn Newspaper*, 1-11.

Demirgüç-Kunt, A. (1989). "Deposit-Institution Failures: A Review of the Empirical Literature". *Federal Reserve Bank of Cleveland Economic Review, 25(4), 2-19.*

Durafe, A., & Singh, M. (2016). Cyclical behavior of public and private sector banks: A comparative study of non-performing assets. *Journal of Business and Management Research, 1*(1), 14-25.

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

Guarda, P., Rouabah, A., &Vardanyan, M. (2013). Identifying bank outputs and inputs with a directional technology distance function. *Journal of Productivity Analysis*, *40*(2), 185-195.

Hashem, H. Y. M. (2016). Determinants of Egyptian banking sector profitability: Time-series analysis from 2004-2014. *International Journal of Business and Economic Sciences Applied Research (IJBESAR), 9*(2), 73-78.

Hou, Y2006, „the non-performing loan problem: some bank level evidence", *University of Birmingham Edgbaston, Birmingham*

Husain, I. (2002). Dealing with non-performing loans of Banks.

IMF (2004).Global Financial Stability Report. *Washington DC.*

Kithinji, A. (2010). Credit Risk Management and Profitability of Commercial Banks in Kenya, *Business School, University of Nairobi*

Makri, V. (2015). What triggers loan losses? An empirical investigation of Greek financial sector.*SPOUDAI Journal of Economics and Business, 65(3-4), 119-143.*

Olweny, T., & Shipho, T. M. (2011). Effects of banking sectoral factors on the profitability of commercial banks in Kenya. *Economics and Finance Review*, *1*(5), 1-30.

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

Rose, P.S. & Hudgins, S.C. (2010). Bank management &financial services. Delhi: *Tata McGraw-Hill Education Private Limited.*

State Bank of Pakistan, 2010. Annual Report 2009-10. Retrieved from: http://www.sbp.org.pk/reports/annual/arFY10/MoneyBanking.pd f

World Bank, 2013.World development indicators. Retrieved from http://databank.worldbank.org/data/download/WDI-2013-ebook.pdf [Accessed March 28, 2016].

Zaini, M., Karim, A., Chan, S., and Hassan, S. (2010). Bank Efficiency and Non- Performing Loans: Evidence from Malaysia and Singapore, *Prague Economic Pap*