

## THE IMPACT OF EXTERNAL FACTORS ON STRESSED BANKING ASSETS: AN EVIDENCE FROM PAKISTANI CONVENTIONAL BANKS

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### Abstract

*This study examined the factors that impact the changes in non-performing loans (NPLs) of conventional banks in Pakistan from 2006 to 2017. The analysis was carried out using Panel Corrected Standard Errors (PCSE) as a suitable regression technique to control the data issues. The unbalanced panel consisted of 20 banks data for 12 years, with seven external variables that made up a total of 235 observations. The predictors were identified from the literature and country-specific relevance. Certain external factors, in particular, the gross domestic product (GDP) and lending interest rate (LIR), were found to exhibit a significant positive impact on NPLs. However, other factors, particularly bank credit to private sector (BCPS) and control of corruption index (CCI), showed a significant negative relationship with NPLs. The impact of unemployment (LagUR) and political stability index (PSI) on NPLs was negative but insignificant. The energy gap impacted NPLs positively but insignificant. The study considered a sample from Pakistan, and only external factors were selected; no bank-specific factors like size, liquidity and profitability were taken into account, which could have explained the variability in NPLs. NPLs are important in the stability of a banking system of a country. Therefore, NPLs and the reasons for changes in the levels cannot be ignored when considering the credit portfolio management of a bank. The negative and significant relationships between BCPS, CCI, and NPLs call for a better approach toward increased lending to the private sector and also better control over malicious lending. This study is thought to be an initial attempt to test the role of external factors identified empirically. This study adds to empirical work in NPLs and provides an insight into the role of various external factors in losses due to NPLs in the context of Pakistani banks. The study provides new evidence of bank credit to the private sector, political stability, corruption, and energy gap impact on NPLs.*

Keywords. *NPLs; Bank credit to private sector; Energy gap; Corruption; Political stability.*  
JEL Codes. *E51; G33; H81.*

### Introduction

Non-performing loans (NPLs) have attracted the attention of banking institutions across the globe because their piling up has caused many banking institutions to be insolvent through a banking crisis due to a sharp increase in NPLs (Barr, Seiford, & Siems, 1994). Hence, it is necessary to understand the factors that can bring changes in the level of NPLs. The central bank's role and regulatory frameworks of a country are responsible for the changes in NPLs. The determinants of NPLs at banks in developing countries have received limited attention in the literature. In Pakistan, the NPL ratio has been increasing since the year 2006 onwards, and it was still high at 10.06% in 2016 (State Bank of Pakistan, 2017). Pakistan has the highest NPLs among the countries in the South Asian region, and the NPLs are above the threshold of 10% of the NPL ratio (Demirgüç-Kunt & Detragiache, 1998), indicating that this issue needs immediate attention in Pakistan. Due to country-specific dynamics, macroeconomic factors are at the center point in Pakistan too. Limited external factors have not been explored in determining NPLs in conventional banks in Pakistan, which leaves a gap in the literature. The motivation to carry out this study was to undertake the most relevant country-specific external

factors to explore the determinants of NPLs in conventional banks in Pakistan.

In this study, we empirically evaluated the impact of different external factors on the NPLs of conventional banks. Our major objective was to explain the variability in NPLs, specifically by assessing whether selected external factors are good explanatory variables in conventional banks. We included all conventional banks as our sample. Further, our data from 2006-2017 were more recent than those of other studies (Waqas, Fatima, Khan, & Arif, 2017). Our study contributes to the existing but limited body of knowledge on the determinants of loan losses in the business context in Pakistan by providing empirical evidence that enables the assessment of the roles of operational indicators on credit risk management in conventional banks in Pakistan.

### **Literature review and hypotheses development**

During the last decade, the literature on NPLs has increased rapidly focusing on the variables that could cause a financial crisis as a result of the soaring of NPLs, which is commonly associated with bank failures and economic crises in both developing and developed countries. In this section, we review the existing literature to develop a theoretical framework to investigate the external determinants of NPLs in Pakistan.

The literature indicates that positive changes in macroeconomic factors, such as economic growth rate, the decrease in annual unemployment, and the lending interest rates are related to loan quality. The capacity of the borrowers to manage their loan repayment increases with the improvement in the external environment that eventually help decrease the number of defaults. Below are some studies conducted in Pakistan and around the world on the determinants of NPLs.

A study by Farhan, Sattar, Chaudhry, and Khalil (2012) covered the period from 2006 to 2012. They focused on the perceptions of Pakistani bankers of interest rate, energy crisis, unemployment, inflation, GDP growth, and exchange rate. A simple regression model was used to analyze all factors. They found that all factors, except GDP growth, had a significant and positive relationship with NPLs. Their study was the first in examining the influence of energy gap on NPLs in Pakistan. The study demonstrated that interest rate, unemployment and energy gap had a positive linkage with problematic loans. Hassan, Ilyas, and Rehman (2014) surveyed bank managers to investigate the influence of political interference on NPLs. They observed that political interference did not have a significant impact on NPLs. They also found that interest rate had a weak relationship with NPLs.

Arif, Abrar, and Afzal (2012) examined the role of credit risk in the value creation process in the banking system of Pakistan and revealed that banks with higher advances in their portfolio were successful in getting the confidence of the shareholders. Ahmad (2013) examined corruption and information sharing between depositors, lenders and financial institutions as the determinants of NPLs. He used three different index values as independent variables, namely the integral index for the perception of corruption, the strength of legal rights index and credit depth of information index with a lending interest rate, and GDP per capita. He found no significant association between corruption and information sharing with NPLs in Pakistan. Badar and Javid (2013) studied the short-run and long-run impact of macroeconomic factors (inflation, exchange rate, lending interest rate, GDP, and money supply) on bank's credit risk in conventional banks of Pakistan and found a long-run relationship between NPLs and money supply and interest rate but a short-run and weak relationship between NPLs and inflation and exchange rate. They used quarterly data for 36 consecutive quarters in their analysis.

Recently, studies on credit risk included both types of factors to gauge the impact of bank-specific and macroeconomic factors on credit risk. In Pakistan, Mehmood et al. (2013) selected the fixed effect model to analyze the impact and found that the significant influence of both kinds of factors. They further verified the results by using the GMM method of analysis. They managed to re-confirm their previous findings with even better and reliable results where they found the significance of macro-financial factors as determinants of NPLs (B. Mehmood, Mahmood, & Ahmed, 2014). To further showed that market share, return on assets, return on equity, lending interest rate, and GDP had a positive and significant impact on NPLs whereas inflation and statutory legal requirements had a significant and negative association with NPLs.

Jameel (2014) also considered both types of factors to examine their impact on NPLs in the banking sector in Pakistan. She took a weighted average lending rate for a better representation of lending interest rate and GDP along with some bank-specific factors. Her study found that GDP was negatively associated with NPLs, while the weighted average lending rate was positively associated with NPLs. She took 11 years of data from 2000 to 2010 and used a multiple linear regression model for analysis. In another study, Zaib et al. (2014) explored the impact of internal and external factors on NPLs in the banking sector of Pakistan by using the fixed effect model on the data from 2003 to 2011 and found that the GDP growth rate and unemployment rate affected NPLs inversely whereas lending interest rate had a positive relationship with NPLs. This study used some time dummies capturing the time-specific factors and found them to be significantly affecting NPLs. Thus, it was hypothesized that:

- H<sub>1</sub>: *GDP growth rate significantly and negatively affects the NPLs in Pakistan.*
- H<sub>2</sub>: *Lending interest rates significantly and positively affect the NPLs in Pakistan.*
- H<sub>3</sub>: *Unemployment rate significantly and positively affects the NPLs in Pakistan.*

Keeton and Morris's (1987) seminal study on the factors influencing NPLs discovered that poor performance of the agricultural and energy sectors with weak economic factors was a leading factor in the increase in NPLs. Their study took the data from 1979-1985 from the USA. Farhan, Sattar, Chaudhry, and Khalil (2012) and Bhattarai (2014) considered energy crisis as an explanatory variable to explain the variation in NPLs through the perceptions of bankers in Pakistan and Nepal and found that energy crisis was significant in explaining NPLs. Despite the limited studies showing the positive influence of energy gap on NPLs, it was hypothesized that:

- H<sub>4</sub>: *Energy gap significantly and positively affects the NPLs in Pakistan.*

Angela and Irina (2015) analyzed the impact of bank credit to private sector on NPLs of 28 European Union countries by considering 14 years of annual data (2000-2013) using simple panel data regression. They found that bank credit to private sector was positively associated with problem loans, which implies that an increase in bank credit to private sector increases NPLs. Klein (2013) found a significant negative influence of Bank Credit to Private Sector (BCPS) on NPLs. Amin, Chernykh, and Imam (2014), and Fofack (2005) presented similar results in their studies while Shaffer (2008) reported an insignificant relationship. Thus, it was hypothesized that:

- H<sub>5</sub>: *Bank credit to private sector significantly and negatively affects NPLs in Pakistan.*

Corruption is a big hurdle in economic growth and development (Park, 2012). It also aggravates the problem with NPLs when funds are channeled to bad projects and not to the good ones.

Bougatef (2015) found a strong and positive link between bad loans and corruption, confirming the results of others (Goel & Hasan, 2011; Park, 2012). However, Chen, Jeon, Wang, and Wu (2015) reported an inverse relationship between corruption and problem loans. Boudriga, Taktak, and Jellouli (2008) reported a strong negative association between corruption and NPLs. However, Nor and Ahmad (2015) in Malaysia and Ahmad (2013) in Pakistan showed an insignificant relationship between corruption and problem loans. Thus, it was hypothesized that:

H<sub>6</sub>: *There is a significant negative relationship between corruption control index and NPLs in Pakistan.*

Among other factors, political environment also has a significant impact on NPLs (Bhattarai, 2014). Boudriga, Taktak, and Jellouli (2010) argued that good governance of well-functioning institutions results in lower risk in the financial system. Similarly, Kabir et al. (2015) found empirical support that good governance reduced banking NPLs. Nor and Ahmad (2015) reported that political stability index had no significant relationship with NPLs of banks in Malaysia. Similar results were also reported by Park (2012) and Shaffer (2008). Thus, it was hypothesized that:

H<sub>7</sub>: *There is a significant and negative relationship between political stability index and NPLs in Pakistan.*

The literature review indicates that very little research has been carried out to examine the determinants of NPLs in the banking sector in Pakistan. Specifically, there is a lack of coherent analysis of external factors and their roles in explaining the changes in the level of NPLs. The external factors like bank credit to private sectors, corruption, political stability, and energy gap were either overlooked or given little attention. So, the analyses in the Pakistani context are quite limited. The past studies were important; however, they only considered traditional factors like GDP, interest rate, inflation, and exchange rate. No other country-specific external factors such as political factors (PSI, Political Stability Index), social factors (CCI, Corruption Control Index), financial factors (BCPS, Bank Credit to Private Sector), and those related to production (lnEG, Natural Logarithm of the Genenergy Gap) were empirically tested.

### **Theory and conceptual framework**

Variations in NPLs due to external factors are generally studied from the perspectives of financial accelerator theory and life-cycle consumption model. Our emphasis on the influence of external factors on the variations in NPLs is to fill the gap indicated above.

Table 1. Explanatory and control variables, symbols and expected signs

S	Explanatory variable	Symbols	Expected sign
1	The annual growth rate of gross domestic product	GDP	-
2	Lending interest rate	LIR	+
3	Annual unemployment rate with a 1-year lag	lagUR	+
4	Natural logarithm of the energy gap	lnEG	+
5	Bank credit to private sector	BCPS	-
6	Corruption control index	CCI	+
7	Political stability index	PSI	-
<b>Control Variables</b>			
1	Natural logarithm of total assets (size)	lnSize	-
2	Natural logarithm of loan loss provisions	lnLLP	+

The identification of new but relevant external factors may help with credit management, a reduction of loan losses, and enhancement of bank performance at the macro level. The conceptual framework is based on the author's previous study (A. Mehmood, Hidhiir, & Nor, 2019). Based on the literature review and conceptual framework, the variables in the present study with the expected signs are displayed in Table 1.

### Methodology, sample, and data

A multiple regression model was selected to test the hypotheses developed within the given theory and conceptual framework. The following panel regression was run with the dependent variable of NPL:

$$NPL_{it} = \alpha_0 + \beta_1 GDP_{it} + \beta_2 LIR_{it} + \beta_3 lagUR_{it} + \beta_4 BCPS_{it} + \beta_5 lnEG_{it} + \beta_6 PSI_{it} + \beta_7 CCI_{it} + \varepsilon_{it}$$

where,  $\alpha_0$  = Constant,  $i$  = Bank  
 $\varepsilon_{it}$  = Error term of bank  $i$  on time  $t$ ,  $t$  = time period

The symbol of the independent variables is shown in Table 1. The data to analyze the external factors throughout 2006 – 2017 were obtained from the Pakistan Economic Survey and World Economic Outlook (World Bank). This period was chosen because the major events that took place in the financial market had directly or indirectly affected the banks' NPLs.

The population of this study was all conventional banks in Pakistan. The list of banks was obtained from the Central Bank's Financial Stability Review (State Bank of Pakistan, 2016). There were 28 commercial banks operating in Pakistan, and 10 of them started operation from 2006 to 2016. That is, nine banks started operation either after 2006 or were taken over by other banks and had a new name. Among these, one public bank, namely the Sindh Bank, started in 2010 and one private bank, the Silk Bank, changed its name after being taken over and started in 2007. So, eight banks were omitted, reducing the population of this study to 20 banks.

### Diagnostics

The descriptive statistics of the sampled data were checked, and the data found to be not normal. Hair et al. (2006) suggested that in large sample size, violation of normality assumption should not cause any major problems. Therefore, this study was based on non-normal data and did not exclude outliers. Next, Pearson's correlation matrix and variance inflation factor were checked, but multicollinearity was not found as all the independent variables had a VIF value less than 10, suggesting no multicollinearity issue.

Further, to diagnose the autocorrelation and heteroscedasticity in the panel data, Wooldridge test and Breusch-Pagan tests were performed, and both were detected in the data. The existence of autocorrelation and/or heteroscedasticity can nullify the efficiency of using the statistical results, whereas bias in estimated standard errors may result in invalid inferences (Brooks, 2014). Initially, regression analysis was carried out under two different techniques, Random Effect Model and Fixed Effect Model. Results of the Breusch-Pagan Lagrange Multiplier (LM) test and Hausman tests found that the Random Effect Model was appropriate.

The cross-sectional dependence (CSD) is another issue in the panel dataset. To detect CSD, Frees' CSD test in the random effect regression model was used. Significant CSD was found in the panel dataset. In the presence of CSD, the results of the random effect model will be unreliable (Hoechle, 2007). Therefore, this study adopted the Prais-Winsten regression where correlated panels corrected standard errors (PCSEs) provide reliable results in the presence of the first order and panel-specific autocorrelation (Mirza, Malek, & Hamid, 2018), and CSD

when  $N > T$  ( $235 > 20$ ), i.e. the case of the current study (N. Beck & Katz, 1995). The results are presented in Table 2.

Table 2. Regression Results (Dependent Variable NPLs)

	<b>Coef.</b>	<b>Std. Err.</b>	<b>Z-Value</b>	<b>P-Value</b>
<b>GDP</b>	0.85	0.19	4.38	0.000*
<b>LIR</b>	0.45	0.13	3.34	0.001*
<b>lagUR</b>	-1.42	0.98	-1.45	0.146
<b>lnEG</b>	0.14	0.09	1.51	0.130
<b>BCPS</b>	-0.24	0.08	-3.01	0.003*
<b>CCI</b>	-0.32	0.09	-3.39	0.001*
<b>PSI</b>	-0.26	0.21	-1.26	0.209
<b>lnSize</b>	-4.99	0.49	-10.19	0.000*
<b>lnLLP</b>	3.73	0.46	8.20	0.000*
<b>Constant</b>	59.30	11.82	5.02	0.000
<b>Observations</b>				235
<b>R<sup>2</sup></b>				0.4744

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

## Results

The R-squared value was 47.44%, which is greater than that reported in past studies in Pakistan by Khan, Ahmad, Khan, and Ilyas (2018), Islam and Nishiyama (2016), and Mehmood et al. (2013) but smaller than other studies of Farhan et al. (2012), Jameel (2014), Ahmad and Bashir (2013), and Zaib et al. (2014). The reason for this variation might be because past studies considered a different set of variables with a different dataset and different period. However, the comparison revealed that some recent studies like those of Islam and Nishiyama (2016) and Mehmood et al. (2013) have a very close value of R-squared with this study, explaining about 48% variation in NPLs.

The findings demonstrated that NPLs were positively related to GDP and LIR and statistically significant at 1%, supporting  $H_1$  and  $H_2$ . NPL was negatively related to BCPS and CCI and statistically significant at 1%, supporting  $H_5$  and  $H_6$ . The R-squared value was 47.44% that shows the role of GDP, LIR, BCPS, and CCI in explaining NPLs. Whereas unemployment rate, energy gap, and political stability showed the predicted relationship with NPLs, they had a statistically insignificant influence on the accumulation of NPLs.

## Discussion of the Results

Although GDP growth rate suggests that the level of NPLs tends to pile up during economic recession (R. Beck, Jakubik, & PiloIU, 2015; Konstantakis, Michaelides, & Vouldis, 2016) around the world and in Pakistan (Abrar, Ahmed, & Kashif, 2018; Ahmad & Bashir, 2013; Islam & Nishiyama, 2016; Khan et al., 2018; Waqas et al., 2017; Zaib et al., 2014), the present study showed a contrasting result. It found a strong and positive relationship between the GDP growth rate and the NPL ratio with a coefficient of 0.85 statistically significant at 95% percent confidence interval, which means that an increase in GDP growth rate increases the level of NPLs. Various explanations could be speculated of the result. It might be that the improvement in the economy of Pakistan during 2006-2017 was not sufficient to help reduce the levels of NPLs, or it could be that loans disbursed were not invested in good projects, or it could be that borrowers were passing through the rough economic circumstances, or the credit screening might not be able to identify ill-intentioned customers. However, the result does not support Fofack's (2005) work that reported a positive but insignificant relationship between GDP

growth rate and NPLs in CFA countries. However, Inekwe (2013) found a statistically significant result on Nigerian data during 1995-2009. In Albania, Shingjergji (2013) later corroborated Inekwe's result.

The coefficient associated with lending interest rate finding was also found to be positive and significant, implying that a high interest rate increases the costs of funds and promotes the culture of high-risk behavior, and loans are approved to high-risk borrowers at a very high interest rate. So, these loans most probably become problem loans, giving rise to NPLs. The finding of the study is in line with past studies in other countries (Beck et al., 2015; Erdinç & Abazi, 2014) and Pakistan (Jameel, 2014; B. Mehmood et al., 2013, 2014; Waqas et al., 2017; Zaib et al., 2014). The present finding, however, contradicts other studies in other countries (Bucur & Dragomirescu, 2014; Fofack, 2005) and Pakistan (Ahmad, 2013; Ahmad & Bashir, 2013).

The bank credit to private sector as a percentage of GDP represents financial depth in a country, and it was found to have a significant negative influence on NPLs as expected. It might mean that during the economic boom, BCPS as a proxy of indebtedness is expected to impact contemporaneous NPLs negatively (Nkusu, 2011), or the lending to non-priority sectors might have reduced the number of NPLs for short duration of time (Das & Ghosh, 2007). The current finding supports other studies by Klein (2013), Nkusu (2011) and Amin, Chernykh, and Imam (2014) while contradicts the result of Konstantakis et al. (2016) and Jakubík and Reininger (2014) results.

Many studies support the “sand-the-wheel” effect of corruption, which means greater corruption increases bad loans (Ahmad, 2013; Batra, Kaufmann, & Stone, 2003; Boudriga, Taktak, & Jellouli, 2009; Goel & Hasan, 2011; Lízal & Kocenda, 2001; Park, 2012; Shaffer, 2008). Chen, Jeon, Wang and Wu (2015) found that banks' soundness decreases with the increase in the intensity of corruption and concluded that the influence of corruption on banks' risk-taking should not be ignored. Boudriga et al. (2008) reported a similar result in the MENA countries. Weill (2011) concluded that banks are careful and conscious when the level of corruption is high.

Other factors did not show any significant influence on NPLs. The insignificant finding of unemployment means that loan portfolios of banks have a negligible volume of personal and consumer loans, or these are well collateralized or securitized in such a way that in case of loan default it has very little influence on the level of NPLs. Zaib, Farid, and Khan (2014) reported a similar but significant result of unemployment on NPLs in Pakistan. Although political stability and energy gap were found to have an insignificant impact on NPLs, the directions of these relationships are as expected. Politically stable environment discourages instability in banking and economic system by reducing the piling of bad loans. Similarly, widened energy gap increases the worries of individual and business borrowers and greatly increases the cost of doing business, which eventually translates into non-payment of their loans.

### **Conclusion, Contributions and Suggestions**

In this study, we discussed the vital external determinants of NPLs, such as GDP, LIR, UR, EG, BCPS, CCI, and PSI. It was found that GDP growth rate has positive covariance with NPLs, which shows that the fruit of economic growth is not being translated in reducing the levels of NPLs. Based on the findings, we can conclude that less lending is done in the private sector, rendering many good projects unfinished and causing an increase in bad loans. Moreover, loans are given out to risky customers for infeasible projects at a high lending

interest rate through political influence. Also, some good projects could get a loan with the help of corruption. A very small portion of available lending is apportioned to consumers as personal loans. This whole vicious circle is aggravated by the increasing energy gap, which further worsens the piling-up of problematic loans.

This study extends the contributions of previous studies on nonperforming loans of conventional banks by furnishing new evidence of nonperforming loans of conventional banks in Pakistan. External factors such as GDP, LIR, BCPS, and CCI were found to be the dominant factors influencing nonperforming loans of conventional banks in Pakistan while lagUR, lnEG, and PSI did not show any significant influence on NPLs. The result showed that conventional banks NPLs are affected by the external factors of BCPS and CCI. However, the study demonstrated a contradictory result as far as GDP influence is concerned in comparison to what was reported by previous studies. The opposing result highlights the changing impact of economic growth in changing conditions. Based on the findings, regulators, policymakers, and government should focus on increasing bank credit to private sector; however, it should be done by controlling corruption in lending, and the credit must be approved by following strict scrutiny so that only creditworthy customer businesses and customers could benefit for the sake of the economic growth of the country.

Some vital country-specific external factors like bank credit to private sector, political stability, corruption, and energy gap were included in this study, but the covariance of these variables can be further confirmed by considering different proxies or taking different perspectives in future research. This study was confined to external variables only. Future research could explore vital internal factors and or examine different corporate governance mechanisms as a moderator. This study used non-performing loans as the dependent variable. Other proxies of credit research may be used to confirm the association of these variables. Further research should be carried out in developing countries that have a different and similar legal, institutional, economic and ownership environment so that the credit risk in a different setting can be explored.

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