IJBMS

Available online at http:// www.ijbms.org

International Journal of Business and Management Sciences
Volume 3(1)

Received 22 January, 2022, Accepted 9 march, 2022, Published 30 March, 2022

Exploring The Impact of Financial Inclusion and Financial Development on Non-Performing Loans: Evidence from Banking Sector of Pakistan

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Keywords:

Financial Inclusion, Financial Development, Non-Performing Loans, Banking Sector

ABSTRACT

The increase in the volume of NPLs is becoming a mounting issue which persuade insecurity and collision of the banks' motivation and ability to keep extending credits, therefore distressing cumulative demand and investments. As financial sector development is on increasing trend and accessibility of financial products to the masses is the core objective of promoting financial inclusion. However, there is a chance that an increase in the financial accessibility could affect the Bank's performance from a non-performing loans perspective and this needs to be verified from empirical evidence. Hence, this study aims to determine the impact of financial inclusion and financial development on non-performing loans in the banking sector of Pakistan. Using random effect model on the panel dataset of 24 Pakistani banks from 2007 to 2019, the study reveals a positive impact of financial development and a negative impact of financial inclusion on non-performing loans. Moreover, it has been found that banks' liquidity position, size, efficiency ratio and net interest income to total interest income ratio have positive impact on non-performing loans; whereas banks trade portfolio, unemployment rate, inflation rate, foreign direct investment and global financial crisis have negative impact on non-performing loans.

INTRODUCTION

Permanence of the financial system was significantly affected by the worldwide financial crisis, therefore; regulatory bodies have issued various guidelines, regulations/policies to protect the banking system and enhance prudential framework and supervision (Radivojević et al., 2019). Banks also embody a significant link in the communication of monetary policy of the country to the rest of the economy. (Ozili, 2019) mentioned in their study that in emerging economies such as Pakistan, Bank deposits are considered as one the most momentous component of the money supply. Furthermore, it's very essential for a stable economy that the provision of liquidity should be made available in an efficient manner by

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the Banks. After the financial crisis, the stability of the financial intermediates was considered as one of the key international agendas, and policymakers such as Basel Accord have issued multiple guidelines for enhancing financial stability (Ozili, 2019). According to the SBP statistics, as of June 2019, Pakistan's banking sector NPLs was at a historical level of Rs.783 billion. As per the analysts, the major reason for the increase in NPLs was lower recoveries due to a higher interest rate. Furthermore, an increase in NPLs was also observed due to the injection of fresh Non-performing loans, lower cash recoveries, and depreciation of the Pak Rupee. Furthermore, due to monetary policy tightening, a higher rate was applied on the new loans, and borrowers faced a hike in interest expense.

To analyse the various determinants of NPLs, various researches have been conducted across the countries and existing research recognizes the attention of policymakers towards the instances of credit defaults. It has been evident in the past studies that there is a relationship exist between macroeconomic variables and advances quality which is used as one of the key measures of the Banks' stability (Zheng et al., 2019). Macroeconomic factors can influence the rising trend of NPLs, furthermore, the impact of bank's specific determinants such as capital, size of the Bank, Bank's liquidity position, and Bank's efficiency on NPLs was also found in the existing research. The impact of cost efficiency on NPLs is also supported by the bad management theory. In the Banking literature, one of the major themes is the determinants of NPLs, and research on the incidence of irregular advances losses arising from the Bank's lending was considered as important attention to policymakers in current years (Zheng et al., 2019). Issue of the NPLs from financial stability perspective is considered as one of the important determinants of the functionality of the financial market. Therefore, determinants of NPLs are required to be critically analyzed and addressed from all perspectives (Shujah-ur-Rahman et al., 2019).

NPLs from bank lending are one of the indicators of the Bank's performance and it has been also evident that the level of monetary sector development is influenced by the performance of the banking sector; therefore, policymakers must comprehend the influence of financial development on NPLs. The role of the monetary system development is also required to be examined by the policymakers. It has been also argued in the existing literature that financial development influences aggregate NPLs. For any economy, the level of financial development plays a significant role from the mobilization of domestic resources perspective. It is also an important factor for the Bank's profitability and efficiency (Ozili, 2019). From financial development perspective and to solve the problems related to financing issues, the

role of financial inclusion cannot be denied. The main aim of financial inclusion is to make certain the ease of use of the financial services to the masses and to solve their problems related to financial difficulties. A comprehensive financial system is very essential to promote financial industry development. In parallel to promote a comprehensive financial system, Banks are also being affected by NPLs and there are potential risks involves in promoting financial development and inclusiveness of the financial system. These risks may also further cause advances quality problems (Chen et al., 2018).

Earning on the advances is one of the major sources of income for Banks and it can't be achieved without booking quality assets. The profitability of the Banks is very much dependent on the quality of advances portfolio and Banks may incur losses from delinquent loans. One of the most used methods used to gauge credit risk exposure is the NPLs ratio and banks always try to keep this ratio at a lower level as this is the indication of healthy advances portfolio of the bank. Allowing financial access to the masses via financial inclusion may allow Banks to onboard un-creditworthy customers that enhance the credit risk and it is also one of the threats to financial stability. It is very necessary to promote financial inclusion without compromising on financial stability; therefore, regulators need to tighten their policies to cut off risky segments (Chen et al., 2018).

The intensity of financial inclusion in emerging countries is low as compared to developed economies because of the constraints and challenges associated with developing economies. In developing countries, the role of financial inclusion plays a significant role in funding individuals and enterprises. It has been evident in the existing literature that the growth of the financial system is not effectively penetrated across all the sectors of the population in Pakistan. There are inequalities and insufficiencies of the financial sector that requires affirmative actions from policymakers. However, it has been evident that financial inclusion would also lead to more exposure towards default risk; therefore, it is essential to empirically analyze the impact of financial industry inclusiveness on a Bank's assets quality (Chen et al., 2018). There is also a need to empirically explore the impact of financial inclusion on NPLs in the banking sector of Pakistan. Furthermore, the importance of commercial banks' NPLs is increasing from the financial regulator's perspective after the implementation of IFRS-9. Therefore, this paper investigates the impact of financial development and financial inclusion on NPLs and empirically analyzes the concept to provide consistent solutions for addressing the problem of the Bank's credit quality.

LITERATURE REVIEW

As per financial stability reports, the major risk that financial system is exposed to is credit risk which mainly arise due to non-payment of loans by the debtors. It has been also identified that rising trend in NPLs is one of the major threats of the banking system and this eventually creates negative impact on bank's ability to repay its deposit (Committee on the Global Financial System, 2018). Excessive lending by the banks may lead to risk of increasing NPLs which create negative impact on bank's adequate capital and liquidity buffers. The increasing trend of the volume of non- performing assets shows that banking institutions are facing credit risk problems that resulted in a high default rate in the industry. In this scenario, banks incurred losses due to credit write-offs which eventually corrodes the asset's value of the bank and creates a negative impact on its capital. To mitigate the increasing trend of Non-performing loans, policymakers have formulated several frameworks such as stringent liquidity and capital requirements, but still rising NPLs remain a key issue (Ashraf et al., 2019).

Recent evidence in the literature also suggests that the financial sector in the emerging countries is less developed as compared to developed countries, therefore suffer a higher risk and create a direct impact on countries' economic development. Further, financial development is one of the important factors that creates positive impact on Bank's profitability and efficiency. Moreover, another important indicator of the Banks performance is NPLs that arise from banks' lending and ultimately influenced the level of financial sector development. Therefore, financial development is needed to be considered as an important determinant of NPLs because the level of financial development creates an impact on banking sector performance. The influence of the financial development on aggregate NPLs needs to be investigated and that is one of the objectives of this paper. One of the major indicators of the Bank's performance is the size of NPLs i.e. the lower the better. It is assumed that some of the financial development characteristics can upsurge the level of NPLs; hence the association between the NPLs and financial development needs to be empirically analyzed (Shujah-ur-Rahman et al., 2019). Existing researches on financial inclusion reflects that financial inclusion is being measured by the concept, which is the availability of financial services for the mass population. It has been evident that financial inclusion would lead to more exposure towards default risk; therefore, it is necessary to empirically examine the impact of inclusiveness of the financial industry on Non-performing loans.

Bank's Specific Factors

(Dimitrios et al., 2016) found that the quality of the management (assessed by the ratio of ROA and ROE) and loan to deposit ratio are the key variables affecting European bank's NPLs. It also reveals that the size of the banks in terms of equity also affect significantly Non-performing loans. Similarly, (Rajha, 2017) found that ratio of advances to total assets is the most important factor that affects Jordanian banks' NPLs among the bank-specific factors. It was also found that the financial crisis of 2008 leads to higher NPLs in Jordan. The study reveals that NPLs not just affected by macroeconomic factors but also by the Bank's specific factors. (Rahman et al., 2016) verified the findings of (Dimitrios et al., 2016) by examine the relationships between NPLs and financial ratios and concluded that advances to deposit ratio and interest spread have an optimistic impact on Bangladeshi banks' NPLs. It also found that NPLs are negatively affected by ROA and CAR and both the variables have an adverse effect on NPLs. There is also a significant positive influence of vulnerable sector loans and the private sector's loan on NPLs which also create an impact on the bank's profitability. NPLs are also negatively affected by the bank's investment to deposit ratio.

Using the Banking data of the Baltic Nations covering a 10-year period from 2005 to 2014, (Kjosevski & Petkovski, 2017) found clear linkages between macroeconomic and industry-specific factors on NPLs. The results showed significant impact of GDP growth, unemployment rates, inflation and credit availability to private sector on the NPL ratio. They found that in industry specific factors such as; return on assets (ROA) return on equity (ROE), loans, and equity to assets ratio were major factors influencing Non-performing loans. While in the macroeconomic factors inflation, GDP, credit availability to private sector, and unemployment rates played major roles. This indicates that the macroeconomics and industry-specific variables tend to influence Non-performing loans. (Kumar, 2015) found that bank-specific variables namely; ROE, profitability, solvency, size in terms of market shares, and capital adequacy ratio, and the macroeconomic variable unemployment were found to have significant negative impact on NPLs. However, the bank-specific variable namely; net interest margin was found to have significant positive impact on NPLs. This shows that the profitability, solvency, size, and interest rate spread of banks determines the stability of the banking sector in Fiji Islands.

To understand the impact on technical efficiencies of Turkish banks due to NPLs collected data on 44 banks operating in the country, (Osei-Assibey & Asenso, 2015) used a custom version of Data Envelopment Analysis (DEA), and found significant decline in technical

efficiencies due to Non-performing loans. This shows that poor management and decision making in the banking sector leads to higher prevalence of NPLs on the industry. They also found that differences in bank ownership structures also significantly impacts the efficiency of the Banking sector in Turkey. Islam and Nishiyama (2019) found that NPLs rates in South Asian countries (namely; Pakistan, India, Bangladesh, and, Nepal) for 15 years from 1997 to 2012 were significantly impacted by the "moral hazard Type 2" (low trust between depositors and bank management). Furthermore, this study confirmed the impact of factors such as; moral hazard, skimping on credit risk, poor management, and bad luck on NPL to confirm the hypothesis which was tested by Berger and DeYoung (1997).

Macroeconomic Factors

Macroeconomic factors that create impact on NPLs were investigated by Ashrafi and Qurrat ul Ain's (2019) in the context of Pakistan's banking sector. Using the panel data approach, regression model, correlation analysis and OLS random effect model for the period of 2010 to 2016, the study concluded that raise in GDP growth rate and inflation has a significant negative impact on NPLs. Narman and Serpil (2019) also found that real GDP growth rate is the core determinant of NPLs from a macroeconomic perspective. Furthermore, foreign direct investment and exchange rates also have a noteworthy impact on NPLs and both of these indicators are statistically significant with NPLs. Raise in the inflation rate reduces the value of loans and creates positive affect loan payable capacity. The study also reflects that unemployment is not suggestively correlated with NPLs in emerging countries (Kuzucu & Kuzucu, 2019).Drago, Dejan, Dejana, Srdjan, & Goran (2019) revealed that GDP has a major influence on NPLs in emerging countries of Latin America. Additionally; inflation has no statistically effect on Non-performing loans. Some Latin American countries have the problem of high inflation and this result reduces the impact of the fact. On the contrary, (Muhammad & Gang, 2016) found that for Chinese Banks, the most important and noteworthy factors of NPLs are interest rate, inflation rate, exchange rate, and GDP growth rate.

To study the effect of monetary policy rates on the prevalence of Non-performing loans, Asiama (2018) used Ghanaian banking sector quarterly data and found that in the short-term horizon the NPLs were found to have insignificantly impacted by the monetary policy decisions. However, in a long-term timeframe NPL growth percentage is significantly impacted by monetary policy decisions. Radivojević, Cvijanović, Sekulic, Pavlovic, Jovic, and Maksimović (2018) used various macro and microeconomic variables which includes the

inflation rate, unemployment rate, GDP, Lending Interest Rate (LIR), the Capital to Assets Ratio (CAR) of banks, and household finale consumption expenditure (HFC). Based on the results, the microeconomic variables and macroeconomic variables namely; inflation rate, unemployment rate, GDP, LIR, and the CAR were found to have insignificant impact on the NLP of the emerging Latin American countries. However, the macroeconomic variable HFC was found to have negative impact on NLP of the emerging Latin American countries (Radivojević et al., 2019).

Using Bangladesh's banking sector data, Zheng, Bhowmik and Sarker (2019) show that prevalence of NPLs in the banking system is significantly influenced by both economic and industry-specific factors. Macroeconomic factors such as exchange rates and credit facilities in the local economy influence Non-performing loans. GDP growth and unemployment on the other hand negatively impact NPLs. Furthermore, industry factors such as lending rates and liquidity of banks positively impact Non-performing loans. Deposit rate, net operating profits and high debt in the industry on the other hand have significant negative influence on NPLs prevalence. Hence it can be deduced that there is a significant influence on the prevalence of NPLs due to macroeconomic and industry based factors.

To define the relevance of critical macro-economic factors in the prevalence of NPLs and their effects, Mehmood, Hidthiir and Nor(2019) found that developing countries faced major challenges of corruption, political uncertainty, and energy shortfall (the supply and demand gap in the energy sector). These issues lead to damaging the performance of the economy since stability is critical for productive business activities. The poor business performance leads to a pile up of bad debt in the banking sector which reduces their capacity to generate further credit. Similarly, Ashraf and Butt (2019) tested the impact of macroeconomic and banking-industry specific factors on NPLs by using 6-year (2010-2016) data of the Pakistani banking sector to test the impact of the factors on NPLs prevalence and found that NPLs decline in the banking sector with rising GDP growth rates, inflation, capital adequacy ratios and size of banks. When the industry has greater provisions for bad debts the NPL ratio was found to increase. Hence for better health of the banking sector it is critical for the industry to quickly phase out NPLs in order to maintain financial sector stability. This is due to the fact that rising NPLs force the banking sector to enhance provision amounts for bad debts. In turn this leads to declining bank fiscal health which has overarching negative impact on the entire country's fiscal and economic well-being. It is imperative for regulatory agencies to critically monitor NPL ratios in the banking sector to ensure economic health.

In order to synthesize the vast research on the factors influencing Non-performing loans, Manz (2019) conducted a systematic review on 44 researches published over 30 years from 1987 to 2017 in different parts of the world. The results of the analysis show that there is still a case to be made for deeper analysis into the issue. It was found that the interaction of macroeconomic and banking industry factors on the asset or loan performance still lacks enough empirical evidence to define the links between them. In a recent study by Son, Liem, Khuong, and Luo (2020) to evaluate how NPLs and economic growth have been impacted by corruption in 120 countries. It was found that due to corruption the level of NPLs rises in the banking sector of a country, which consequently reduces economic growth (Son et al., 2020).

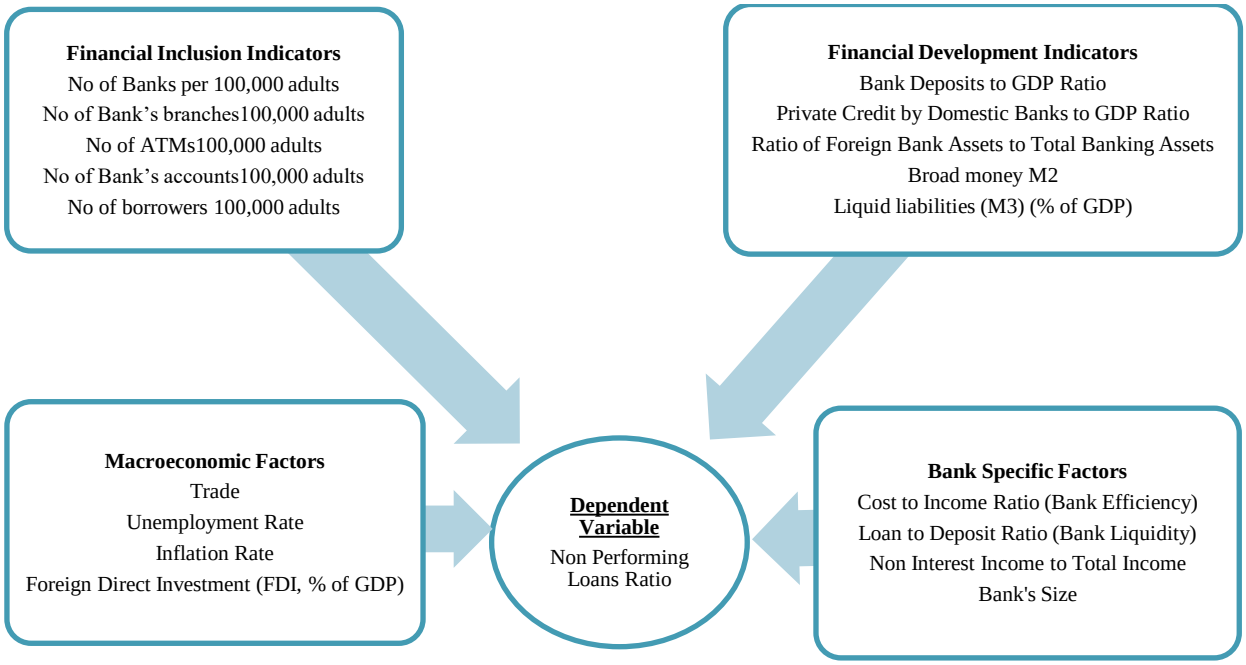

Figure 1: Framework

RESEARCH METHODOLOGY

This study used the quantitative approach to analyze and interpret the secondary data so that meaningful findings and conclusion can be drawn from it. Using the quantitative approach statistical analyses will be applied to analyze the data. The study's purpose is explanatory as it aims to increase the understanding of the impact of financial inclusion and financial development on NPLs as there is a gap in existing literature and requirement for more studies in this context. The study used secondary sources to address the problem which requires

further deliberation in the existing literature. This study will help to understand the problem in more efficient manner related to determinants of NPLs from financial inclusion and financial development perspective; and to get the new insights about influence of financial inclusion and financial development on NPLs in the banking industry of Pakistan.

Causal research design was employed in this study because it permits research to evaluate the causal relationship between dependent and predicting variables, to understand how the predicting variables can impact the dependent variable(s). As per (Catterall, 2000) Studies that establish causal relationships between variables may be termed explanatory research. It was appropriate to select the causal research design in line with the research purpose which is explanatory as explained above. Therefore, to understand what kind of relationship occurs between financial inclusion, financial development, and NPLs the causal research design was selected.

To analyze the NPLs of commercial banks in Pakistan, this study employed a composite index of financial inclusion and financial development. The index was computed using Principal Component Analysis (PCA) method. We introduced four bank specific variables (efficiency, bank liquidity, bank size and net interest income). Similarly, four macroeconomic variables are included in the model as controlled variables (foreign direct investment, inflation, unemployment and trade). A dummy variable is also used to represent the financial crisis in the sample data.

To assess the relationship between non-performing loans, financial inclusion and financial development, the functional form of the panel regression model is as follows:

NPLs= f (financial inclusion, financial development, bank-specific variables, macro-economic variables, financial crisis)

……...Eq. (1)

The econometric form of panel regression model is written as:

$$NPL = \alpha + \beta 1FIDEXnt + \beta 2FDDEXnt + \beta 3EFFnt + \beta 4BLnt + \beta 5BSnt + \beta 6NIInt + \beta 7FDInt + + \beta 8INFnt + \beta 9UNEMPnt + \beta 10TRnt + \beta 11FCnt + \epsilon nt \quad \text{Eq. (2)}$$

The Principal Component Analysis (PCA) was employed to compute the financial inclusion and financial development index, using the aforementioned variables of financial inclusion and financial development (Lenka & Sharma, 2020). The panel data (secondary data) was collected for the selected variables of financial inclusion, financial development,

macroeconomic, and bank's specific variables (including NPLs) for period of 12 years from 2007 to 2019. The data for the macroeconomic, financial and other variables used in this study was panel data therefore non-stationary of the data for the period of 12 years (2007 to 2019) was tested by conducting Panel Unit Root Test (URT) using IPS and LLC methodology.

Data Normality Test:

Correlation test has been applied to find out multi collinearity between independent variables.

Table 3 Pearson Correlation Test

	BL	BS	EFF	NII	FDDEX	FIDEX	INF	NPL	TR	UNEMP	FDI
BL	1										
BS	-0.166	1									
EFF	-0.356	0.476	1								
NII	-0.129	0.454	0.090	1							
FDDEX	0.791	-0.09	-0.25	-0.01	1						
FIDEX	-0.386	0.482	0.099	0.718	-0.251	1					
INF	0.711	-0.38	-0.81	-0.53	0.464	-0.08	1				
NPL	-0.092	-0.02	-0.08	0.179	-0.324	-0.05	0.372	1			
TR	0.420	-0.47	-0.08	-0.09	0.331	-0.24	0.830	0.043	1		
UNEMP	-0.425	0.479	0.194	0.605	-0.269	0.398	-0.84	-0.06	-0.43	1	
FDI	0.549	-0.47	-0.27	0.415	0.372	-0.68	0.847	-0.04	0.276	-0.781	1

Table 3 reflects the correlation between independent variables, which is not more than the bare minimum threshold level, suggests that multi-collinearity is not a problem in our research.

Results of Panel Unit Root Test

Researcher used multiple variables and there is possibility that variable stability may have impact on empirical analysis and can reduce the results accuracy; therefore, before regression, it is recommended to apply unit root test. In this study researcher has applied panel unit root test methods including, IPS test and LLC test. Panel Unit root test results are shown in Table 4. Panel unit root was also applied to check whether the variables were stationery or non- stationary with the objective to avoid spurious regression.

Table 4 Panel Unit Root Test Results

	LLC				IPS			
	I (0)		I (1)		I (0)		I (1)	
Variables	**C**	**C&T**	**C**	**C&T**	**C**	**C&T**	**C**	**C&T**
FIDEX	-0.803	2.656	-4.226***	-7.180***	4.879	1.530	-7.084***	-2.839***
FDDEX	-0.157	1.256	-4.262***	-3.758***	1.181	-0.506	-3.464***	-5.166***
EFF	2.376	0.841	-2.476**	-3.794***	3.183	-0.030	-3.940***	-2.877***
BL	-0.856	1.669	-2.996***	-2.869***	-0.321	1.444	-6.025***	-5.7992***
BS	1.896	1.465	-4.252***	-3.804***	0.886	1.989	-5.046***	-4.335***
NII	1.475	0.934	-2.876***	-4.587***	2.208	0.857	-2.845***	-3.665***

FDI	0.585	1.422	-4.805***	-3.383***	1.682	1.013	-4.211***	-3.528***
INF	1.746	1.588	-5.904***	-5.758***	1.209	0.985	-4.338***	-5.146***
UEMP	2.017	1.680	-3.505***	-2.987***	1.799	1.237	3.758***	-3.031***
TR	1.282	2.144	-3.557***	-5.652***	1.451	1.985	-4.237***	-5.403***
NPL	-0.224	-0.857	-1.749**	-3.733***	-0.485	-0.652	-2.774***	-3.846***

***, **, * indicates significance level at 1% and 5% respectively

Source: Authors' estimation.

Results in Table 4 indicated IPS panel unit root test. Results revealed that null hypothesis at I (0) can't be rejected with 1% and 5% level of significance for all variables used in the research. However, at 1(1) for all given series of variables, null hypothesis is rejected at 1% level of significance. Results indicate that all variables are non-stationery at level and stationary at first differences. Hence, we conclude that all of our variables are integrated of the same order I (1).

Results of Panel Co-integration

In this study the co-integration is used to check whether the relationship of independent variables with the dependent variable exists for long run or not and so test the validity of relationship of the variables. This test is conducted in this study to test the null hypothesis that there is no co-integration present in the dataset.

Ho = No Co-Integration

Kao Test of Co integration (Engle–Granger Based)

This research has used Kao's (1999) methodology to examine the long-run relationship among the variables for research model.

Table 5: Kao Panel Co integration Test

	T-Statistic	**Prob.**
ADF	-15.989	0.0000
Residual variance	1828.407	
HAC variance	245.243	

Table 5 indicates that alternate hypothesis is accepted and the null hypothesis was rejected based on the results of co-integration test at 5% significance level. Therefore, it was found that there is presence of long run equilibrium relationship among the variables.

In order to check the suitability of panel models, Hausman test has been performed. This model is used to find out that the either fixed effect or random effect will be more appropriate. In Table 6, for model, the Hausman test reported a p value of 0.980 implying that at 5 percent level, the chi-square obtained was statistically insignificant. The study therefore accepts the null hypothesis of no systematic difference between the estimates of the Random effects model and fixed effects model. Thus, the random effects model will be used.

Table 6: Correlated Random Effects - Hausman Test

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	0.000	11	0.980

DATA ANALYSIS

The Panel econometric model (Random Effect) in E-views version 9 was used to investigate the impact of the financial inclusion, financial development, macroeconomic variables, and bank's specific factors on Non-performing loans because when the null hypothesis of Hausman test is accepted, then one should adopt estimations from the random effect model (Ali & Puah, 2018).

Table 7: Regression Analysis (Random Effect Models)

	Dependent Variable: NPL		
Variable	**Coefficient**	***T*-value**	***P*-value**
C	4.147	11.900	0.000
FDDEX	-0.113	-6.005	0.000
FIDEX	0.811	15.722	0.000
BL	-0.255	-15.310	0.000
BS	-0.043	-0.757	0.449
EFF	-0.052	-17.631	0.000
NII	-4.962	-16.002	0.000
TR	0.369	14.764	0.000
UNEMP	0.220	13.654	0.000
INF	0.065	24.526	0.000
FDI	0.221	9.255	0.000
FC	0.826	13.422	0.000
Adj R^2 = 0.98			
DW statistics = 2.72			
F-statistics = 0.00***			
Wald test: X^2= 28.04***			
Hausman test: X^2 = 78.22***			

Results in table 7 indicate that R^2 is 0.98 which reflects that independent variables have high

explanatory power on non-performing loans. F statistics is also significant, p value for all variables except BS is less than 0.05 which indicates independent variables have significant effects on NPLs in case of banking industry of Pakistan.

The regression coefficient of -0.113 reflects that increase in financial development would lead to 0.113 units decrease in NPLs. Financial development was found to have a negative relationship with non-performing loans. It has been found that level of NPLs in Pakistan reduce by increasing financial development due to prudent and strong regulatory system. Interestingly the results are different from the finding of Ozili (2018) who investigated the impact of financial development on NPLs and found that financial development is positively correlated to NPLs.

Furthermore, table 7 reflects that the p value of financial inclusion indicators is less than 0.05 that reveals that there is significant relationship between financial inclusion and NPLs. The regression coefficient of 0.811 reflects that increase in financial inclusion would lead to 0.811 units increase in NPLs. Financial inclusion was found to have a positive relationship with NPLs. Findings show that financial inclusion has negative impact on NPLs. It was found that the NPL's increases when financial inclusion reaches at high level. This indicates that financial inclusion can significantly impact the financial and banking industry and so governments shall take necessary measures to curtail this impact so that the asset quality of the banks can be maintained and stabilized. Findings are also supported by earlier studies conducted by Chen, Feng and Wang (2018) & Musau, Muathe and Mwangi (2018) where it is established that risky clients in the banking system may increase due to increase in the number of banked individuals via a financial inclusion. These kinds of clients also fail to pay their loans which eventually increase the credit risk exposure. Results are also theoretically supported financial asymmetry theory. The theory was proposed by Akerlof in 1970 and perceives that it may be tough to distinguish well from bad borrowers. Increase in the number of the borrowers and bank accessibility would increase in exposure which ultimately increases the chances of non-performing loans. It is established that risky clients in the banking system may increase due to increase in the number of banked individuals via a financial inclusion.

Moreover, table 7 reflects that bank liquidity (measure by advances to deposit ratio) is statistically negatively significant with NPLs. Results reveals that increase in bank liquidity would decrease in non-performing loans. This provides support to the hypothesis that banks with better liquidity and regulatory capital are less likely to have problems with NPLs.

Results are consistent with earlier studies conducted by Ozili (2019) and Zheng, Bhowmik and Sarker (2019).

Table 7 also shows that p value of bank size is greater than 0.05 and bank size is statistically insignificant with non-performing loans. It has been found that NPLs decline in the banking industry of Pakistan with rising size of the banks. Results are also consistent with earlier study conducted by Ashraf and Butt (2019). Results also reflect that banks efficiency (measured by cost to income ratio) has also significant negative impact on NPLs. NPLs are reduced by the high banks efficiency and this result is also supported by earlier study conducted by Ozili and Thankom (2018). Similarly, net interest income to total income has also significant negative relationship with NPLs. Results are also consistent with the finding of Zheng, Bhowmik and Sarker (2019).

Impact of macroeconomic indicators on NPLs has also identified in this research. Table 7 represents that p value of trade is statistically significant and shows that relationship between trade and NPLs. The regression coefficient of 0.369 reflects that increase in trade would lead to 0.369 units increase in NPLs. Bank's trade number was found to have a positive relationship with NPLs. Similarly, results also reflect that unemployment also creates negative impact on NPLs and higher the unemployment rate, higher the NPLs because borrower ability to repay loan is affected by unemployment. NPLs and the unemployment rate are statistically significant. Results are also in line with earlier studies conducted by Kumar, Stauvermann, Patel, and Prasad (2018) and Zheng, Bhowmik and Sarker (2019). Furthermore, inflation, foreign direct investment and global financial crisis have positive significant relationship with non-performing loans.

CONCLUSION

The growth of the financial industry especially the banking sector was greatly influenced by the issue of non-performing loans. NPLs may create series of financial problems; therefore, researchers are required to explore the determinants of NPLs from various perspectives, so that efficient solutions can be derived. Research to date has very few studies that empirically analyze the joint relationship between financial development, financial inclusion, and NPLs. Therefore, exploring the impact of the inclusiveness of the financial system on NPLs would help regulators in emerging countries to draft the framework to control the advances quality of the banking sector. This study aims to explain the impact of financial inclusion and financial development on NPLs in the banking sector of Pakistan. For this purpose, the

researcher has empirically tested the impact of the financial inclusion index and financial development index (index calculated via principle component analysis) on NPLs along with macroeconomic and banks specific variables. The analysis was performed by using panel data from 2007 to 2019 via Panel econometric random effect model. This research uses financial inclusion and financial development variables along with macroeconomic (Trade, inflation, foreign direct investment, and unemployment) and bank's specific variables (bank's liquidity position, bank's efficiency, cost to income ratio, and bank's size). The results concluded that the level of NPLs in Pakistan reduce by increasing financial development due to a prudent and strong regulatory system. However, financial inclusion hurts NPLs. It was found that the NPL's increase when financial inclusion reaches a high level. This indicates that financial inclusion can significantly impact the financial and banking industry and so governments shall take necessary measures to curtail this impact so that the asset quality of the banks can be maintained and stabilized. Furthermore, our findings suggest that the bank's specific variables have a positive impact on NPLs and the level of non-performing loan reduction by increasing the bank's liquidity, efficiency, the cost to income ratio, and bank's size. However, it has been found that selected macroeconomic variables (trade, unemployment, inflation, and foreign direct investment) have a negative impact on NPLs.

Policy Implications

Based on our findings, we suggest that policymakers should take necessary measures to curtail the negative impact of financial inclusion on NPLs so that the asset quality of the banks can be maintained and stabilized. There is a chance that asset quality may be compromised from rapid credit growth associated with new financial institutions that promote financial inclusion such as EMIs (electronic money institutions, microfinance banks, FinTech’s, etc.). Onboarding of risky customers into the banking system should be discouraged by the bank's policy; which should be drafted in a way that can distinguish between good and bad borrowers. An increase in the number of the bad quality borrowers and bank accessibility would increase in exposure which ultimately increases the chances of NPLs. Credit risk standards for microloans should also be more conservative and prudent. Policymakers should also enhance their vigilance while approving new products related to the credit, especially those are being offered to the low-income segment by electronic money institutions, microfinance banks, FinTech’s. New processes should be introduced that can improve borrower identification from a credit risk perspective. It is also suggested to policymakers/regulators to develop incentive plans for banks and link this with the targets of

the banks to reduce NPLs. This will also improve the efficiency of the banking industry. Furthermore, based on the findings, it is also recommended that policymakers should also focus on bank-specific variables to make the banking system more resilient. Banks should focus on increasing their liquidity position by improving their advances to deposit ratio. The low-cost deposit will ultimately help banks to invest fewer risk advances as the spread is directly linked with the cost of the deposit. Banks should also focus on investing liquid assets which will create a positive impact on the bank's NPLs ratio. The liquidity of the bank should also be protected by avoiding approvals of poor-quality loans. Considering all these facts, banks should extend their scope of regulatory surveillance to assess the stability and soundness of the bank. The regulator also needs to closely monitor the bank's capital adequacy and liquidity position by paying more attention to different regulatory ratios. The regulator should also emphasize risk management procedures and systems used by the banks to avoid any financial instability in the future.

Future Research

There are some limitations of the available data and it would be beneficial for future studies to segregate NPLs of corporate and consumer since determinants of both categories may vary from each other. NPLs can also be breakdown by type of activity or by category of loan to perform a more detailed analysis. Future research can also find the impact of the bank's internal credit assessment, credit monitoring, and collateral handing on Non-performing loans. Future researchers could also take the obligor risk rating (ORR) as a measure for assessing the quality of the credits. Future studies can also take other indicators of financial inclusion such as number of FinTech's, branchless banking agents, EMIs, etc. This research has used data of the Pakistan Banking sector only as access to the international data was the limitation. Future researchers can get the international data from a paid data basis to perform the analysis in the content of International Banking industry. Future researchers could also find out the impact of IFRS 9 on NPLs.

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APPENDIX

Table1: Summary of the Reviewed Empirical Studies

Authors	Year	Variables		Method of Analysis	Findings
		Dependent	Independent		
Kjosevskia and Petkovskib	(2016)	Non-performing loans	Macroeconomic variables (GDP growth, unemployment rates, inflation and credit	Regression	Macroeconomics and industry-specific variables tend to influence Non-performing loans.

			availability) and industry-specific factors (ROA, ROE, loans, and equity to assets ratio)		
Ahamed and Mallick	(2017)	Bank stability	Financial inclusion	Correlation, SYS-GMM model and cross-sectional regression	Comfort of entree to financial services for individuals and small businesses leads to greater stability in the banking sector.
Chauvet and Jacolin	(2017)	Bank concentration and Financial inclusion	Performance of companies in terms of growth, profitability, and size	Panel regression analysis with fixed effects	When bank concentration is low while financial inclusion is high then companies tend to achieve high growth.
Pal and Mitra	(2017)	Asset quality of MIFs	The number of people borrowed loans from an individual loan officer	Stochastic Frontier Analysis (SFA)	The asset quality of MIFs is not compromised when the loan officers give loans to large number of borrowers.
Asiama	(2018)	NPLs	Monetary policy rates	Autoregressive Distributed Lag (ADL) model	Monetary policy rates had a significant effect on NPL.
Partovi and Matousek	(2018)	Technical efficiencies	NPLs and differences in bank ownership structures	Quantile Regressions and DEA	The NPLs and differences in bank ownership structures can have significant negative impact on technical efficiency of banks.
Radivojević et al.	(2018)	NPL	Various macro and microeconomic variables such as; inflation rate, unemployment rate, GDP, LIR, CAR of banks, and HFC	GMM and system GMM models	Inflation rate, unemployment rate, GDP, LIR, and the CAR were found to have insignificant impact on the NLP
Chen, Feng and Wang	(2018)	NPL	Financial inclusion	Panel regression analysis with fixed effect	NPL's was found to be negatively impacted by financial inclusion
Musau, Muathe and Mwangi	(2018)	NPLs in terms of credit risk	Financial inclusion in terms of; usage, accessibility, and availability of the banks	The panel regression analysis	NPLs (credit risk) were found to be significantly impacted by the financial inclusion (usage, accessibility, and availability of the banks).
Chavan and Gambacorta	(2018)	Non-performing loans	Loan growth, interest rate and economic growth	Dynamic Panel Data (DPD) model based on GMM	The loan growth, interest rate and economic growth were found to have significant positive impact on the Non-performing loans.
Kumar, Stauverman, Patel, and Prasad	(2018)	Non-performing loans	Bank-specific variables and the macroeconomic variables such as; unemployment rate,	Panel regression analyses using pooled OLS, fixed effects,	ROE, profitability, solvency, size in terms of market shares, and capital adequacy ratio, and unemployment were found

			inflation rate, exchange rate, remittances, economic growth, political instability, and global financial crisis	and random effects	to have significant negative and net interest margin was found to have significant positive impact on Non-performing loans.
Le, Chuc, and Hesary	(2019)	Financial efficiency and sustainability	Financial inclusion	PCA and Feasible Generalized Least Squares (FGLS)	Financial inclusion has positive impact on sustainability while negative impacts on financial efficiency
Rahman et al.	(2019)	Financial development	Environmental quality (in terms of carbon emission), real income, real output, and energy consumption)	Granger Causality test and Autoregressive Distributed Lag (ARDL)	Financial development was found to have significant mediating relationship with environmental quality, real income, and energy consumption.
Hussain et al.	(2019)	Financial resilience	Financial inclusion	Logistic regression analysis and chi-square test	Financial inclusion has significant impact on financial resilience.
Zheng, Bhowmik and Sarker	(2019)	Non-performing loans	Macroeconomic and industry specific factors	ARDL model and VEC model	GDP growth, unemployment, deposit rate, net operating profits and high debt have negative influence, while exchange rates and credit facilities have positive influence on Non-performing loans.
Mehmood, Hidthiir and Nor	(2019)	Non-performing loans	Economic variables; lending interest rate, unemployment rate, GDP, corruption, political uncertainty, energy shortfall, and the bank credit to private sector	Panel regression	Corruption, political uncertainty, and energy shortfall can have significant positive impact on Non-performing loans.
Ashraf and Butt	(2019)	Non-performing loans	Macroeconomic and banking-industry specific factors	Regression OLS with random effect model	NPLs decline in the banking sector with rising GDP growth rates, inflation, capital adequacy ratios and size of banks.
Manz	(2019)	Non-performing loans	Macroeconomic and banking industry factors	Systematic review	The interaction of macroeconomic and banking industry factors on the asset or loan performance still lacks enough empirical evidence to define the links between them.
Ozili	(2019)	NPL	Financial development	Panel OLS regression with fixed effects, GMM regression	Financial development is positively correlated to Non-performing loans.
Islam and	(2019)	NPL	Moral hazard,	GMM	Moral hazard, skimping

Nishiyama		prevalence	inflation, management quality, credit risk, GDP growth, bank size, and industry growth	regression	credit risk, poor management quality, and bad luck have significant positive impact on NPL.
Son, Liem, Khuong, and Luo	(2020)	NPLs and economic growth	Corruption	3SLS panel regressions	NPLs and economic growth was found to be positively impacted by the corruption

Table 2: Variable Description

Variables	Description	Symbol	Data source
Dependent variable			
Non-performing loans	Ratio of NPLs to total loans	NPL	State bank of Pakistan
Independent variables			
Financial inclusion	A composite index of financial inclusion indicators namely, commercial bank branches per 100,000 adults, total no. of commercial banks, no. of ATM machines per 100,000 adults, commercial bank deposit accounts per 100,000 adults and commercial bank borrowers per 100,000 adults constructed through PCA method	FIDEX	World bank
Financial development	A composite index of financial development indicators namely, bank deposits to GDP ratio, private credit by domestic banks to GDP ratio, foreign bank assets to total banking assets ratio, broad money (M2) and liquid liability (M3) as a percentage of GDP constructed through PCA method	FDDEX	World bank
Efficiency	Cost to income ratio	EFF	State bank of Pakistan
Bank liquidity	Loan to deposit ratio	BL	State bank of Pakistan
Bank size	Natural log of total asset	BS	State bank of Pakistan
Net interest income	Non-interest income to total income ratio	NII	State bank of Pakistan
Foreign direct investment	Net outflows as a percentage of GDP	FDI	World bank
Inflation	Inflation rate (annual)	INF	World bank
Unemployment	Labor force percentage without jobs	UNEMP	World bank
Trade	Sum of imports and exports of goods and services as a percentage of GDP	TR	World bank
Financial crisis	Dummy variable where 1= crisis period and 0= non-crisis period	FC	Self-constructed