

	<p>Annals of Social Sciences and Perspective</p> <p>ISSN (Print): 2707-7063, ISSN (Online): 2788-8797 Volume 4, Number 1, January-June 2023, Pages 01-14 Journal homepage: http://assap.wum.edu.pk/index.php/ojs</p>
---	---

Macroeconomic Factor Affecting Non-Performing Loans (NPLs): Evidence from Commercial Bank in Pakistan Based ARDL Cointegration Approach

Mirza Aslam Baig¹, Muniba Ghaffar^{2*}, Shahzad Ali³

¹ M.Phil Scholar, Superior University Lahore, Pakistan. aslambaig796@gmail.com

² M.Phil Scholar, Superior University Lahore, Pakistan.

³ Faculty of Management Sciences, Superior University Lahore, Pakistan. shahzadalird@gmail.com

*Corresponding Author's Email Address: munibaghaffar11@gmail.com

ARTICLE DETAILS	ABSTRACT
<p>History:</p> <p>Received: December 22, 2022 Accepted: February 09, 2023</p> <p>Keywords:</p> <p>Inflation, Corruption, Interest rate, Unemployment, GDP, NPL</p> <p>DOI:</p> <p>10.52700/assap.v4i1.229</p>	<p>The main objective of this study is to measure the NPLS in Pakistan's commercial bank. The macroeconomic factor of Country GDP, corruption, unemployment, political instability and inflation it's nettle the level of NPLS in commercial bank in Pakistan. The unemployment, increasing of interest rate, low economic growth and money laundering they elaborate the changing in NPLS. high inflation, unemployment ratio, huge cases of corruption, political instability are faced by the country. we are working time series data of Pakistan from 1972 to 2022 by using ARDL long and short run. We find that there is long run relationship exist between the variables, and co-integration also have positive and significant impact on NPLS. The observation of this study shows that efficiency of managing the productivity had important effects on NPLS. The policy maker should be establishing the steps for creditors to ensure superb loan management and they will grant to the banks. If the better steps for loan will be establish then the bank will be stable and so their works efficiently. The Finding shows that GDP has positive/negative and significant impact on NPLS of commercial banking in Pakistan in long run/ short run. However, corruption has positive/negative and insignificant impact on NPLs in long run/ short run, we also find that inflation has negative and significant impact on NPLs in long run/short run, we also observed that interest rate has negative and significant impact on NPLs in long run/short run.</p> <p>© 2023 The Authors, Published by WUM. This is an Open Access Article under the Creative Common Attribution Non Commercial 4.0.</p>

1. Introduction

Every commercial bank's primary activity is financing and acquiring. Banks perform crucial role in management and circulation of money and financial products. Industrial development is dependent on such financial intermediaries' temporary function (Ebenezer, Omar, & Kamil, 2017). The banking sector has a wide range of responsibilities. Banks effectively use creditor assets, possibilities and challenges, contribute significantly to economic growth, are constantly crucial to the entire financial system, and continue to be at focus of economic

crises(Allen, Carletti, & Gu, 2008). Even if bank services and credit are mutually advantageous, banks do not bear the risk that certain debts could turn into NPLS, which deters them from issuing Crediton of mortgage companies and banks were specifically blamed for the worldwide economic crisis of 2007–2008; the rising debt burden and well over were so extreme that the fourth-largest investment bank in the United States, Lehman Brothers Holdings Inc., declared bankruptcy in 2008.(Swedberg, 2010).Economic problems were observed to have raised substantially throughout the recent past and now being felt on a global scale. 2007 saw evidence of such a argument in the form of the economic meltdown and market disruption(Saleuddin & Jansson, 2021; Shuhao, 2021).

As a result, the banking industry in these economies plays a significant intermediary function. while offering the lending services to different industries and people in their respective economies(Bougatef, 2016).Outstanding to the existence of different danger elements in their operative or other business-based operations, banks are also renowned for "doing the business of risk"(Omarova, 2018; Waemustafa & Sukri, 2015; Hassan et al., 2022).When considering the economy of Pakistan, the finance structure is a crucial component in supplying the monetary report to the entire financial system(Waemustafa & Sukri, 2015).Furthermore, it has been noted that there has been worry in latest years regarding the rising problem inferior standard of assets, as NPLs, in the nation. Additionally, a comprehensive review of the banking industry since 2006 reveals that it is susceptible to rising creditworthiness. The price of NPLs was Rs. 446.05 billion in the previous ten years, or it rose to Rs. 611.81 billion by 2017(Kamran, Omran, & Bahrain, 2019).

The international literature of NPLS suggested that stock market performance, lack of infrastructure, lack of government support, exchange rate, money supply, random error, return on assets, bank capital, income divergence, unemployment, inflation, interest rate, GDP, corruption, political solidity last five variable are more important and less focused and in literature.(Rajan and Dhal 2003) find optimistic association between GDP and NPLS.(Mehmood, Hidthiir et al. 2019) find positive relationship between corruption and NPLs. Inflation has negative impact on NPLS according to (Khemraj and Pasha 2009;Owusu- Ankamah and Sakyi 2021). In addition to finance structure, policymakers, or academics all place are high value upon that concept of NPLs. The association among macroeconomic indicators on NPLs was extensively researched, however little has been written about the connection among macroeconomic variable unique to banks or NPLs. Throughout the research, our only concentrate on the commercial banks as we evaluate the Pakistani capital system. Reviewing prior material allowed for the identification of research gaps. (Ishaq, Karim, Zaheer, & Ahmed, 2016)concentrated attention on inside or bank-specific criteria, but this research tries to leverage four additional external factors(Bodla & Verma, 2006;Molina, 2002).To assess the relationship among NPLs and its factors, we construct empirical analysis and develop hypotheses.

1.1 Objectives of the Study

1. To examine the long-term association among macroeconomic factors and NPLS.
2. To investigate how macroeconomic dynamics will affect NPLS in the near future.
3. To assist monetary and fiscal policy makers in filling up the gaps and in making the best judgments by sharing the research empirical findings.

2. Literature Review:

In latest years, the works on non-appearing credits has employed the hobby of numerous researchers specify their consciousness to know-how predictors at risk of the economic

weakness(Khemraj & Pasha, 2009). This weakness is defined by the position of awful liability as uncovered by way of the sturdy dating among NPLs and finance disasters. Indeed(Sorge, 2004)claimed the usage of such predictors (NPLs or mortgage dead provisions) to evaluate the weakness of the monetary gadget assessments. We will discuss several elements which is affected NPLs in this literature review. The discussion of Mehmood et al, (2019) reveal various macroeconomic feature that relates the Pakistan conventional banking which effect the degree on NPLs. But there is Un-clearness between External factors and NPLs. This contribution shows positive connection of the elements while other shows the negative points of this study.

2.1. NPLS and Inflation:

NPLS is closely connected with inflation. Inflation is occur when the purchasing power of the people low down due to high prices of product, and the social income of the people also low down with the expectation of fixed society income(Mankiw, 2006).When the amount of products or services constantly increase or the people's buying capacity also low down, and this situation creates problems for the banking customers to pay their debts to banks.(Albra, Syamni, & Habibie, 2018;Naibaho, 2018;Leka, Bajrami, & Duci, 2019)said the inflation effect the positive and important relation with regards to NPLS and the increases of product and services prices will active the credit ratio of several economic sectors by NPLS. As the inflation is consider the external element which emphatically effect NPF and show the inferior economic condition that creates high financing risk and the other way round. Many earlier research record that the inflation is rise the NPF, while GDP decrease the NPF(Adebola, Yusoff, & Dahalan, 2011;Kabir, Worthington, & Gupta, 2015).

H1:Inflation has insignificant impact on NPLS

2.2. Impact of Interest Rate on NPLs

The interest rate is the loan rate that has been adjusted for inflation using the GDP deflator as a benchmark. According to latest studies, interest rates get a favorable or considerable impact on nonperforming loans(Jakubik and Kadioglu 2022; Castro 2013;Khemraj and Pasha 2009). Increased debt levels are evident from rising interest rates, which also make debt servicing more expensive and challenging. As a result, NPLs increased(Boss, Fenz et al. 2009). In contrast to such results, NPLs are reduced by lowering the interest rate, and as a result, bank profits are also reduced. Siddiqui, Malik et al. (2012)discover that the amount of non-performing loans in the Pakistani banking system is mostly influenced by interest rate volatility.

H2: A significant and negative impact is found between interest rate and NPLs.

2.3. Relationship of NPLs on corruption

The La Porta, Lopez- de- Silanes et al., (1997)study, that presented the law and finance theory, can be used as the main justification for how corruption may hinder credit creation. By assuring the execution of loan agreements and so protecting banks avoid debtor default, strong regulatory and judicial organizations can improve banks' borrowing. (Goel and Hasan 2011) research is the only one that experimentally examines the link between economic corruption and NPLs. According to this research, greater levels of corruption cause more risky debts in the targeted countries as opposed to lower loan default rates in economies with quicker growth rates and higher loan rates. Parallel to this, Bougatef (2016) investigates the effects of corruption on the caliber of bank deposits in several emerging economies from 2008 to 2012. Furthermore, Park (2012) investigates the effects of corruption on the banking industry and the expansion of 76 economies between 2002 and 2004.

H3: Corruption has positive impact on NPLs.

2.4. Impact of GDP on NPLS

The actual gross home merchandise deliverables had a detail of world financial production. Economic boom basis raised the revenue far away from modern employment chances that drop down financial affliction on borrowers, ease and to observe the decline the ratio banks of NPLs (Elyassi, 2021; Park & Shin, 2021; Makri, Tsagkanos, & Bellas, 2014; McCann & O'Malley, 2021). The opposite, the melancholy (economic) denigrate profits because of increase in jobless rate (Alexandri & Santoso, 2015; Chaibi & Ftiti, 2015). On the other hand, banks carry out fairly gloom throughout melancholy and reduce borrowing and upward thrust distribution for lease lifeless or bounce worrying about elevated NPLs.

Several research shows poor relation among NPLs and financial progress (Lubis & Mulyana, 2021; Prastowo & Usman, 2021; Mohaddes, Raissi, & Weber, 2017). Even though some researchers defined nice or widespread hyperlink between them (Beck, Jakubik, & Piloju, 2015; Alexandri & Santoso, 2015). However, few research showed a irrelevant affiliation among GDP increase and non-acting loans (Žunić et al., 2021; Dimitrios, Helen, & Mike, 2016; Nor, 2015; Singh et al., 2021).

The end results, it briefs little deliverables boom of GDP decline capital redirection or borrowers' credit paying capacity on identical time as, equally better GDP motives towards upward thrust in NPLs. Therefore, because of irregularity many of the connection of NPLs and outcome boom (% of GDP). However, the ensuing argument can be installed:

H4: GDP has positive impact on NPLs.

3. Methodology:

In this study, we use an established co-integration assessment method known as the Autoregressive Distribution Lag Technique (ARDL) limits testing methodology, which is enclosed by (Klasra, 2011) and then extended through (Dewachter, Iania, & Lyrio, 2014). Compared to previous co-integration systems, this method offers a number of advantages. The endogeneity issue is resolved by the ARDL method of co-integration, which typically yields fair and consistent approximations of the longer-term coefficients and accurate t-statistics even though some of the explanatory variables are exogenous. It also explains the problem with the autocorrelation and the ignored variables. The ARDL technique to approximate co-integration produces green or impartial coefficients since it tackles the problem that can result from serial correlation and endogeneity (Dickey & Fuller, 1979). The ARDL methodology can be used in place of other co-integration methods nevertheless of whether the causal regressors are included in level, first difference, or mutually. Additionally, the ARDL technique for co-integration is more appropriate and dynamic because it isn't always sensitive to the pattern's scale. As a result, we decide to use the ARDL modelling approach to investigate co-integration in the study. As soon as co-integration is complete, the short-term and long-term relationships can be evaluated. The implicit take research examines the relationship between NPLs, inflation, unemployment, GDP, and corruption using time series records for the years 1972 to

2022. The data time has been Selected based solely on the availability of the statistics.

$$NPL = f(CR, GDP, INF, IR)$$

As a result, we obtain the following equations, where each variable's coefficient directly contributes to the elasticity, after converting all the variables into natural logarithmic form

$$\ln NPL_t = \alpha + \beta_1 \ln CR_t + \beta_2 \ln GDP_t + \beta_3 \ln INF_t + \beta_4 \ln IR_t + \mu_t$$

Where α is the intercept, and $\beta_1\beta_2\beta_3\beta_4$ are coefficients NPL_t is the natural log of per capita NPLs, CR_t is the natural log of per capita Corruption, GDP_t is the natural log of per capita GDP, Inf_t is the natural log of per capita inflation, IR_t is the natural log of per capita of interest rate and u is the Gaussian error term.

Table 1: Variables and Data

Variables	Abbreviation	sources
NPLS	NPL	WDI
Corruption	CR	WDI
Gross Domestic Product	GDP	WDI
Inflation	INF	WDI
Interest Rate	IR	WDI

The general form of the empirical specification of the PMG model can be written as below.

$$y_{it} = \sum_{j=1}^p \lambda_{ij} y_{i,t-j} + \sum_{j=0}^q \delta_{ij} X_{i,t-j} + \mu_t + \varepsilon_{it}$$

Where λ_{it} is a scalar, u_{it} is a group-specific effect, and $I = 1, 2, \dots, N$ for the number of cross sections, and x_{it} is a vector of $K \times 1$ regressors. The disturbance term is an I(0) process if the variables are I(1) and co-integrated. The co-integrated variables' response to any departure from long-term equilibrium is one of their key characteristics. This trait implies that the system's variables' error-correction dynamics are affected by deviations from equilibrium. In order to create the error correction equation, it is typical to re-parameterize the above equation as

$$\Delta y_{it} = \phi_i y_{i,t-j} - \theta_i x_{i,t-j} \sum_{j=1}^{p-1} \lambda_{ij} \Delta y_{i,t-j} + \sum_{j=0}^{q-1} \delta_{ij} \Delta x_{i,t-j} + \mu_t + \varepsilon_{it}$$

The speed of adjustment is indicated by the error correction parameter ϕ_i . There is no proof that variables have a long-term association if $\phi_i=0$ exist.

The ARDL model below illustrates the current connections that need to be examined:

$$NPL_t = y_0 + y_1 NPL_{t-1} + y_2 CR_{t-1} + y_3 GDP_{t-1} + y_4 INF_{t-1} + y_5 IR_{t-1} + \sum_{i=1}^p a_1 \Delta NPL_{t-1} + \sum_{i=1}^q a_2 \Delta CR_{t-1} + \sum_{i=1}^q a_3 \Delta GDP_{t-1} + \sum_{i=1}^q a_4 \Delta INF_{t-1} + \sum_{i=1}^q a_5 \Delta IR_{t-1} + \varepsilon_t$$

In this equation, $\alpha_1, \alpha_2, \alpha_3, \alpha_4$ represent the short-term parameters while y_1, y_2, y_3, y_4 , represent the long-term parameters. The ARDL bound test is initially used to verify the co-integration in which the critical values are calculated and contrasted in order to evaluate the long-term relationship of CR, GDP, INF, and IR with NPL. The F-statistics must be larger than the highest lower bound in order to decide on co-integration, hence Pesaran et al. (2001)'s advice is used.

as well as upper bound value. For the F-bound co-integration test, the null hypothesis states that:

$$y_1 = y_2 = y_3 = y_4 = 0$$

It signifies that the null hypothesis predicts that there is no co-integration in the data, whereas the alternative hypothesis predicts that co-integration is present in the data. Table 4 contains the results of the co-integration test.

$$\begin{aligned} \Delta \ln NPL_t = & \alpha_0 \\ & + \sum_{i=1}^p \alpha_1 \Delta \ln NPL_{t-1} + \sum_{i=1}^p \alpha_2 \Delta \ln CR_{t-1} + \sum_{i=1}^p \alpha_3 \Delta \ln GDP_{t-1} \\ & + \sum_{i=1}^p \alpha_4 \Delta \ln INF_{t-1} + \sum_{i=1}^p \alpha_5 \Delta \ln IR_{t-1} + \lambda_1 \ln NPL_{t-1} + \lambda_2 \ln CR_{t-1} \\ & + \lambda_3 \ln GDP_{t-1} + \lambda_4 \ln INF_{t-1} + \lambda_5 \ln IR_{t-1} + \varepsilon_t \end{aligned}$$

On the right-hand side, the expression from λ_1 to λ_5 depicts the long-run relationship between the variables, while the expression from α_1 to α_5 with the summation signs corresponds to the short-run dynamics of the variables. On the other hand, α_0 represents drift constant and ε_t is Gaussian white noise.

Table 2: Unit Root

variables	ADF Test		PP Test	
	I(0)	I(1)	I(0)	I(1)
NPL	-2.688 (0.083)	-4.617 (0.000)	-2.090 (0.249)	-4.692 (0.000)
CR	-3.477 (0.013)	-5.634 (0.000)	-2.835 (0.060)	-6.266 (0.000)
GDP	-3.088 (0.034)	-5.108 (0.000)	-2.701 (0.081)	-5.209 (0.000)
INF	-1.420 (0.214)	-4.395 (0.000)	-1.520 (0.311)	-5.466 (0.000)
IR	-3.391 (0.018)	-6.231 (0.000)	-5.367 (0.000)	0.563 (0.986)

In Table 2, when it comes to macroeconomic data, the unit root test is a superior method to descriptive statistics for evaluating the suitability of secondary data for ARDL modeling. Through these experiments, it is discovered that CR, GDP, IR and NPL are stable at a level, whereas INF is not. However, INF become stationary at the first difference.

Table 3: Descriptive Statistics

	NPL	CR	GDP	INF	IR
Mean	9.493	-0.827	10.961	0.887	8.896

Median	9.593	-0.739	10.997		8.539
Maximum	10.047	-0.073	11.327	1.425	11.931
Minimum	8.840	-1.736	10.540	0.464	6.844
Std. Dev	0.407	0.350	0.239	0.224	1.620
Skewness	-0.244	-0.313	-0.236	0.184	0.411
Kurtosis	1.526	4.515	1.830	2.927	1.836
Jarque-Bera	3.714	4.148	2.452	0.217	3.128
Probability	0.156	0.001	0.293	0.896	0.209

Table 3 represent the results of descriptive statistics of the modeled variables. Table 2 represents the mean, median, skewness, kurtosis, minimum and maximum value of each variable for the period of 1972-2021. The result shows that the mean value of NPL is 9.493 with a minimum value of 8.840 and a maximum value of 10.047. Moreover, the value of CR ranges from -1.736 to -0.073 with a mean score of -0.827. The average value of GDP is 10.961 with the minimum and maximum value of 10.540 to 11.327. Similarly, the mean value of INF is 0.887, ranging from 0.464 to 1.425. IR has an average value of 8.896 with the lowest value of 6.844 and the highest value of 11.931. (Thadewald & Büning, 2007) is used for testing the normality of residuals. The probability value indicates that the value of CR null hypothesis of “residuals are normally distributed” is rejected. However, in macro data analysis, without satisfying the normality assumption we can proceed with our model, it will not disturb the relationships (Amemiya, 1974).

Table 4: Correlation Analysis

Correlation	NPL	CR	GDP	INF	IR
NPL	1.000000				
CR	0.152	1.000000			
GDP	0.691	0.174	1.000000		
INF	-0.158	-0.474	-0.176	1.000000	
IR	-0.491	-0.177	-0.475	0.211	1.000000

Table 4 shows result of correlation analysis. The findings show that there is very weak relationship between CR and NPL. Furthermore, it is also observed that there is strong relationship between GDP and NPL. Moreover, it is also observed that there is very weak relationship between INF and NPL. However, it is observed that there is moderate relationship between IR and NPL.

Table 5: Bound Test Cointegration Approach

Test Statistics	Value	Significance	I(0)	I(1)
F-static	13.806	10%	1.8	2.8
K	9	5%	2.04	2.08
		2.5%	2.24	3.35
		1%	2.5	3.65

Source of critical values: Pesaran et al. (2001).

The value of F – statistic shows that there is cointegration at I (1). Table 5 explains the analysis of F bound cointegration approach it shows that the value of F bound is greater than upper bound so this present that long run relationship exist.

Table 6: Short run ARDL Estimates

Variables	Coefficient	Std. Error	t-Statistics	Prob.
CR	-1.47	7.49	1.967	0.096
GDP	-3.61	7.9	-4.57	0.003
INF	-9.202	1.597	-5.76	0.001
IR	-6.22	1.24	-5.011	0.002
CointEq(-1)*	-0.749	0.401	-6.855	0.005

Table 6 shows the results of short run relationship. Error correction sign is negative and significant. The results show that there is negative and significant relationship between CR and NPLs at 10% level of significant, it implies that 1% change in CR will lead to change in NPLs at -1.47%. Furthermore we confirmed the negative and significant change between GDP and NPLs at 5% level of significant, which means that 1% change in GDP will lead to change in NPLs at -3.61%. However this is also found that short run shows negative and significant relationship between INF and NPLs at 5% level of significant, which implies that 1% change in INF will lead to change in NPLs at -9.2%. We also observed that IR has negative and significant relationship with NPLs at 5% level of significant, it implies that 1% change in IR will lead to change in NPLs at -6.2%.

Table 7: Long Run ARDL Estimates

Variables	Coefficient	Std. Error	t-Statistics	Prob.
CR	5.25	4.41	0	0.012
GDP	4.51	8.72	0.003	0.003
INF	-1.54	3.801	0	0.001
IR	-3.91	8.8	0.001	0.005

Table 7 shows the outcomes of long analysis it represent that there is positive and significant relation between NPLS and CR at 5% level of significant, it means that 1% change in CR will lead to change in NPLs at 5.25%. It is also observed that there is positive and significant between GDP and NPLs at 5% level of significant, it means that 1% change in GDP will lead to positive change in NPLs at 1.54% (Khemraj and Pasha 2009). We also observed that a negative and significant result shown between INF and NPLs, it implies that 1% change in INF will lead to negative change in NPLs at -1.54% (Berhani and Ryskulov 2014). We also confirmed that there is negative and significant relationship between IR and NPLs, it implies that 1% change in IR will lead to negative change in NPLs at -3.91%.

4. Findings:

The finding shows that GDP has positive and significant effect on NPLS. This result suggests that an increase in the real economy strengthens the borrower's ability to pay off their loans,

which in turn helps to reduce the amount of NPLS(Rajan & Dhal, 2003;Fofack & Fofack, 2005;Chase, Greenidge, Moore, & Worrell, 2005;Khemraj & Pasha, 2009;Greenidge & Grosvenor, 2010).Inflation has insignificant and negative impact on NPLS of Pakistan commercial banking and this finding indicates the study of (Khemraj & Pasha, 2009; Berhani & Ryskulov, 2014) but some contribution shows there is positive and significant association among inflation and NPLS (Shingjergji, 2013;Wood & Skinner, 2018). The results also shows that corruption has insignificant impact on NPLS (Chen et al., 2015), but some authors shows significant impact of corruption on NPLS(Mehmood et al., 2019).(Owusu- Ankamah and Sakyi 2021) has negative impact on NPLs. According to (Owusu- Ankamah and Sakyi 2021) interest rate has negative impact on NPLs.

5. Conclusion

This study focus on the empirical analysis of external factors that affect the commercial banking system of Pakistan with a conceptual framework. The previous finding of literature review shows that in every commercial banking system the risk factor is very high due to external factors. The factors that are using in above literature present the positive and significant relationship. Corruption effects the economy and which effects the banking system of country with high credit risk. In south Asian countries Pakistan is the most prominent country which is facing risk in NPLs. The main objective of this research is to point out the features which decide the NPLs in this country. If the political affairs in Pakistan is stable than the ratio of NPLs in country will be strong. Furthermore, the finance structure of every country play important role in development plans. The discussion shows that new techniques should be evaluated and managing the rate of risk is very important to overcome the level of NPLs, also some policy should be introduced for internal and external control and assist the banking activities. The policy creator must be launching the appraises for creditors to certify terrific finance running and they will endowment on the way to the banks. The government take better steps for loan and the bank will be secure and thus their facilities resourcefully.

References:

- Adebola, S. S., Yusoff, W. W., & Dahalan, J. (2011). An ARDL approach to the determinants of nonperforming loans in Islamic banking system in Malaysia. *Kuwait Chapter of Arabian Journal of Business and Management Review*, 1(2), 20-30.
- Ahmad, F. (2013). Corruption and information sharing as determinants of non-performing loans. *Business Systems Research: International journal of the Society for Advancing Innovation and Research in Economy*, 4(1), 87-98.
- Albra, W., Syamni, G., & Habibie, M. (2018). What is the determinant of non-performing financing in Branch Sharia Regional Bank in Indonesia *Proceedings of MICoMS 2017*: Emerald Publishing Limited.
- Alexandri, M. B., & Santoso, T. I. (2015). Non performing loan: Impact of internal and external factor (Evidence in Indonesia). *International Journal of Humanities and Social Science Invention*, 4(1), 87-91.
- Allen, F., Carletti, E., & Gu, X. (2008). The roles of banks in financial systems. *Oxford handbook of banking*, 32-57.
- Barth, J. R., Caprio, G., & Levine, R. (2008). *Rethinking bank regulation: Till angels govern*: Cambridge University Press.
- Beck, R., Jakubik, P., & PiloIU, A. (2015). Key determinants of non-performing loans: new evidence from a global sample. *Open Economies Review*, 26(3), 525-550.

- Bofondi, M., & Ropele, T. (2011). Macroeconomic determinants of bad loans: evidence from Italian banks. *Bank of Italy Occasional Paper*(89).
- Boudriga, A., Boulila, N., & Jellouli, S. (2009). Does bank supervision impact nonperforming loans: cross-country determinants using aggregate data?
- Bougatef, K. (2015). The impact of corruption on the soundness of Islamic banks. *Borsa Istanbul Review*, 15(4), 283-295.
- Breuer, J. B. (2006). Problem bank loans, conflicts of interest, and institutions. *Journal of financial stability*, 2(3), 266-285.
- Bodla, B., & Verma, R. (2006). Evaluating performance of banks through CAMEL Model: A case study of SBI and ICICI. *The IUP Journal of Bank Management*(3), 49-63.
- Bougatef, K. (2016). How corruption affects loan portfolio quality in emerging markets? *Journal of Financial Crime*.
- Boss, M., et al. (2009). "modeling credit risk through the Austrian business cycle: An update of the OeNb model." *Financial Stability Report* 17: 85-101
- Chaibi, H., & Ftiti, Z. (2015). Credit risk determinants: Evidence from a cross-country study. *Research in international business and finance*, 33, 1-16.
- Chase, K., Greenidge, K. C., Moore, W., & Worrell, D. (2005). Quantitative assessment of a financial system-Barbados.
- Chen, M., Jeon, B. N., Wang, R., & Wu, J. (2015). Corruption and bank risk-taking: Evidence from emerging economies. *Emerging Markets Review*, 24, 122-148.
- Castro, V. (2013). "Macroeconomic determinants of the credit risk in the banking system: The case of the GIPSI." *Economic Modelling* 31: 672-683.
- Dewachter, H., Iania, L., & Lyrio, M. (2014). Information in the yield curve: A Macro-Finance approach. *Journal of Applied Econometrics*, 29(1), 42-64.
- Dickey, D. A., & Fuller, W. A. (1979). Distribution of the estimators for autoregressive time series with a unit root. *Journal of the American Statistical Association*, 74(366a), 427-431.
- Dimitrios, A., Helen, L., & Mike, T. (2016). Determinants of non-performing loans: Evidence from Euro-area countries. *Finance research letters*, 18, 116-119.
- Elyassi, H. (2021). Economics of the financial crisis: any lessons for the pandemic downturn and beyond? *Contemporary Economics*, 15(1), 100-122.
- Ebenezer, O. O., Omar, W. A. W. B., & Kamil, S. (2017). Bank specific and macroeconomic determinants of commercial bank profitability: Empirical evidence from Nigeria. *International Journal of Finance & Banking Studies*, 6(1), 25.
- Fofack, H., & Fofack, H. L. (2005). *Nonperforming loans in Sub-Saharan Africa: causal analysis and macroeconomic implications* (Vol. 3769): World Bank Publications.
- Ghosh, A. (2015). Banking-industry specific and regional economic determinants of non-performing loans: Evidence from US states. *Journal of financial stability*, 20, 93-104.
- Goel, R. K., & Hasan, I. (2011). Economy-wide corruption and bad loans in banking: international evidence. *Applied Financial Economics*, 21(7), 455-461.
- Goensch, J., Gulyas, A., & Kospentaris, I. (2021). *Unemployment Insurance Reforms in a Search Model with Endogenous Labor Force Participation*. Retrieved from
- Greenidge, K., & Grosvenor, T. (2010). FORECASTING NON-PERFORMING LOANS IN BARBADOS. *Journal of Business, Finance & Economics in Emerging Economies*, 5(1).
- Guy, K., & Lowe, S. (2011). Non-performing loans and bank stability in Barbados. *Economic Review*, 37(1), 77-99.

- Goel, R. K. and I. Hasan (2011). "Economy-wide corruption and bad loans in banking: international evidence." *Applied Financial Economics* **21**(7): 455-461.
- Hassan, K. H. U., Sheikh, S. M., & Rahman, S. U. (2022). The Determinants of Non-Performing Loans (NPLs); Evidence from the Banking Sector of Pakistan. *Annals of Social Sciences and Perspective*, *3*(1), 1-22.
- Hasan, R., & Ashfaq, M. (2021). Corruption and its diverse effect on credit risk: global evidence. *Future Business Journal*, *7*(1), 1-13.
- Hassan, M. K., Hasan, R., Miah, M. D., & Ashfaq, M. (2021). Corruption and bank efficiency: Expanding the 'sand or grease the wheel hypothesis' for the Gulf Cooperation Council. *Journal of Public Affairs*, e2737.
- HU, J. L., Li, Y., & CHIU, Y. H. (2004). Ownership and nonperforming loans: Evidence from Taiwan's banks. *The Developing Economies*, *42*(3), 405-420.
- Ishaq, A., Karim, A., Zaheer, A., & Ahmed, S. (2016). Evaluating Performance of Commercial Banks in Pakistan:'An Application of Camel Model'. *Available at SSRN 2716691*.
- Jungo, J., Luzendo, W., Quixina, Y., & Madaleno, M. (2022). Corruption, Credit Risk, and Bank Profitability: Evidence of Angolan Banks Handbook of Research on New Challenges and Global Outlooks in Financial Risk Management (pp. 83- 98): IGI Global.
- Jakubik, P. and E. Kadioglu (2022). "Factors affecting bank loan quality: a panel analysis of emerging markets." *International Economics and Economic Policy* *19*(3): 437-458.
- Kabir, M. N., Worthington, A., & Gupta, R. (2015). Comparative credit risk in Islamic and conventional bank. *Pacific-Basin Finance Journal*, *34*, 327-353.
- Kasinger, J., Krahen, J. P., Ongena, S., Pelizzon, L., Schmeling, M., & Wahrenburg, M. (2021). *Non-performing loans-new risks and policies? NPL resolution after COVID-19: Main differences to previous crises*. Retrieved from
- Kassem, M. (2022). The Impact of Capital, Corruption, and Institutional Factors on the Stability of MENA Region Banks. *The Journal of Developing Areas*, *56*(2), 15-30.
- Khemraj, T., & Pasha, S. (2009). The determinants of non-performing loans: an econometric case study of Guyana.
- Klasra, M. A. (2011). Foreign direct investment, trade openness and economic growth in Pakistan and Turkey: An investigation using bounds test. *Quality & Quantity*, *45*(1), 223-231.
- Konstantakis, K. N., Michaelides, P. G., & Vouldis, A. T. (2016). Non performing loans (NPLs) in a crisis economy: Long-run equilibrium analysis with a real time VEC model for Greece (2001–2015). *Physica A: Statistical Mechanics and its applications*, *451*, 149-161.
- Kamran, H., Omran, A., & Bahrain, S. (2019). Determinants of non-performing loans in world economy, EU, G10 and G20 member states: Aggregated and disaggregated analysis. *Revista Dilemas Contemporáneos: Educación, Política y Valores*, *6*, 1-39.
- Leka, B., Bajrami, E., & Duci, E. (2019). Key Macroeconomic Drivers on Reducing Non-Performing Loans in Albania. *Academic Journal of Interdisciplinary Studies*, *8*(2), 88.
- Louzis, D. P., Vouldis, A. T., & Metaxas, V. L. (2012). Macroeconomic and bank-specific determinants of non-performing loans in Greece: A comparative study of mortgage, business and consumer loan portfolios. *Journal of Banking & Finance*, *36*(4), 1012-1027.
- Lubis, D. D., & Mulyana, B. (2021). The Macroeconomic Effects on Non-Performing Loan and its Implication on Allowance for Impairment Losses. *Journal of Economics, Finance and Accounting Studies*, *3*(2), 13-22.

- La Porta, R., et al. (1997). "Legal determinants of external finance." *The journal of finance* 52(3): 1131-1150.
- Mahyoub, M., & Said, R. M. Factors Influencing Non-Performing Loans: Empirical Evidence from Commercial Banks In Malaysia. *Research Journal of Business and Management*, 8(3), 160-166.
- Makri, V., Tsagkanos, A., & Bellas, A. (2014). Determinants of non-performing loans: The case of Eurozone. *Panaeconomicus*, 61(2), 193-206.
- Mankiw, N. G. (2006). Principles of Economics, terjemahan Criswan Sungkono. *Salemba empat. Jakarta*.
- McCann, F., & O'Malley, T. (2021). Resolving mortgage distress after COVID-19: some lessons from the last crisis.
- Mehmood, A., Hidhiir, M. H. B., & Nor, A. M. (2019). A conceptual paper for macroeconomic determinants of non-performing loans (NPLs) In banking sector of Pakistan. *Asian Journal of Multidisciplinary Studies*, 7(3), 6-15.
- Mohaddes, K., Raissi, M., & Weber, A. (2017). Can Italy grow out of its NPL overhang? A panel threshold analysis. *Economics letters*, 159, 185-189.
- Mohamad, A., & Jenkins, H. (2021). Corruption and banks' non-performing loans: empirical evidence from MENA countries. *Macroeconomics and Finance in Emerging Market Economies*, 14(3), 308-321.
- Molina, C. A. (2002). Predicting bank failures using a hazard model: the Venezuelan banking crisis. *Emerging Markets Review*, 3(1), 31-50.
- Naibaho, K. (2018). *Pengaruh GDP, Inflasi, BI Rate, Nilai Tukar terhadap Non Performing Loan Bank Umum Konvensional Di Indonesia Tahun 2012-2016*. Universitas Brawijaya.
- Nor, A. M. (2015). Impaired financing determinants of Islamic banks in Malaysia. *Information Management and Business Review*, 7(3), 17-25.
- Obeid, R. (2022). The Impact of the Over-indebtedness of the Household Sector on the Non-performing Loans in the Banking Sector in the Arab Countries. *European Journal of Business and Management Research*, 7(1), 51-60.
- Owusu- Ankamah, E. and D. Sakyi (2021). "Macroeconomic instability and interest rate spreads in Ghana." *Business Strategy & Development* 4(1): 41-48.
- Omarova, S. T. (2018). Central banks, systemic risk and financial sector structural reform *Research Handbook on Central Banking*: Edward Elgar Publishing.
- Park, C.-Y., & Shin, K. (2021). COVID-19, nonperforming loans, and cross-border bank lending. *Journal of Banking & Finance*, 133, 106233.
- Prastowo, W., & Usman, H. (2021). The Influence of Internal and External Factors on NPF And NPL. *AFEBI Economic and Finance Review*, 6(1), 37-55.
- Qureshi, F., Qureshi, S., Vo, X. V., & Junejo, I. (2021). Revisiting the nexus among foreign direct investment, corruption and growth in developing and developed markets. *Borsa Istanbul Review*, 21(1), 80-91.
- 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.
- Rehman, A., Abdul Adzis, A., & Mohamed Arshad, S. B. (2020). The relationship between corruption and credit risk in commercial banks of Pakistan. *International Journal of Innovation, Creativity and Change*, 11(1), 701-715.
- Saleuddin, R., & Jansson, W. (2021). Revisiting subprime pricing irrationality during the global financial crisis. *The Journal of Financial Crises*, 3(2), 1-40.

- Shaffer, M. (2008). *Corruption and the accumulation of problem loans*. Paper presented at the MPSA Annual National Conference.
- Shingjergji, A. (2013). The Impact of Macroeconomic Variables on the Non Performing Loans in the Albanian Banking System During 2005-2012. *Academic Journal of Interdisciplinary Studies*, 2(9), 335.
- Shu, C. (2002). The impact of macroeconomic environment on the asset quality of Hong Kong's banking sector. *Hong Kong Monetary Authority Research Memorandums*, 2002, 1-26.
- Shuhao, W. (2021). *Exploring the Principles and Laws of Financial Crisis: from the Subprime Mortgage Crisis to New Crown Epidemic*. Paper presented at the 6th International Conference on Financial Innovation and Economic Development (ICFIED 2021).
- SINGH, S. K., BASUKI, B., & SETIAWAN, R. (2021). The Effect of Non-Performing Loan on Profitability: Empirical Evidence from Nepalese Commercial Banks. *The Journal of Asian Finance, Economics and Business*, 8(4), 709-716.
- Sorge, M. (2004). Stress-testing financial systems: an overview of current methodologies.
- Swedberg, R. (2010). *The structure of confidence and the collapse of Lehman Brothers Markets on trial: The economic sociology of the US financial crisis: Part A*: Emerald Group Publishing Limited.
- Siddiqui, S., et al. (2012). "Impact of interest rate volatility on non-performing loans in Pakistan." *International Research Journal of Finance and Economics* 84(1): 66- 75.
- Taiwo, I., & Mike, M. E. E. (2021). Empirical Analysis of Non-Performing Loans and Liquidity of Deposit Money Banks: Nigeria Experience. *Journal of International Business and Management*, 4(9), 01-14.
- Toader, T., Onofrei, M., Popescu, A.-I., & Andrieș, A. M. (2018). Corruption and banking stability: Evidence from emerging economies. *Emerging Markets Finance and Trade*, 54(3), 591-617.
- Touny, M. A., & Shehab, M. A. (2015). Macroeconomic determinants of non-performing loans: An empirical study of some Arab countries. *American Journal of Economics and Business Administration*, 7(1), 11-22.
- Weill, L. (2011). How corruption affects bank lending in Russia. *Economic systems*, 35(2), 230-243.
- White III, G. O., Chintakananda, A., & Rajwani, T. (2022). Seeds of Corruption? The Contingent Role of Ties to Politicians and Foreign Subsidiary Relations with Government- Sponsored Financial Institutions. *British Journal of Management*.
- Wood, A., & Skinner, N. (2018). Determinants of non-performing loans: evidence from commercial banks in Barbados. *The Business & Management Review*, 9(3), 44-64.
- Waemustafa, W., & Sukri, S. (2015). Bank specific and macroeconomics dynamic determinants of credit risk in Islamic banks and conventional banks. *International Journal of Economics and Financial Issues*, 5(2), 476-481.
- Waemustafa, W., & Sukri, S. (2015). Bank specific and macroeconomics dynamic determinants of credit risk in Islamic banks and conventional banks. *International Journal of Economics and Financial Issues*, 5(2), 476-481.
- Zaib, A., Farid, F., & Khan, M. K. (2014). Macroeconomic and bank-specific determinants of non-performing loans in the banking sector in Pakistan. *International Journal of Information, Business and Management*, 6(2), 53.
- Žunić, A., Kozarić, K., & Dželihodžić, E. Ž. (2021). Non-performing loan determinants and impact of covid-19: Case of bosnia and herzegovina. *Journal of Central Banking Theory and Practice*, 10(3), 5-22.

Mirza Aslam Baig, Muniba Ghaffar, Shahzad Ali