



# Assessing the Non-Performing Loans and their Effect on Banks Profitability: Empirical Evidence from the Saudi Arabia Banking Sector

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Ensuring an effective operation and outstanding performance of banks requires a deep focus on assets that generate income for the banks; this is because a negative effect of an asset may lead to a negative and ineffective output of financial institutions. Therefore, the study aims to investigate the relationship between the non-performing loans and selected specific bank determinants (internal factors) and macroeconomic determinants (external factors) in the Saudi banking sector. The sample of the study covers all the twelve commercial banks that were operating in the Kingdom of Saudi Arabia. The study uses a panel data for period from 2009 to 2018. The study employed a variety of statistical tools such as the descriptive statistics, correlation and the regression analysis. The correlation result showed a negative insignificant weak relationship between nonperforming loans ratio (NPLs) and return on assets ratio (ROA), growth gross domestic product (GGDP), bank liquidity risk (BLQ), and credit risk. It further indicates a positive insignificant weak relationship between the NPL and capital adequacy ratio (CAR).



**Keywords:** *Non-performing loans, bank specific factors, macroeconomics determinants, commercial banks KSA*

**JEL Classification:** C23, C51, G21, G28, E44

## 1. Introduction

The process of disbursing loans by financial institutions such as banks is an easy task however; the recovery operation of this amount might be a bit challenging one. Banks wish to lend as many as they can of loans just to show they have a high number of borrowers and regardless of the quality of the clients will end up bankrupt, (Baselega-Pascual et al. 2015) This is a very critical issue as it affects the performance and operation of the bank. This effect is reflected in the number of non-performing loans (henceforth is NPLs) or the so called default loans, once the number of NPA increases it means banks are expected to have a negative performance that reflect on the overall profitability of the banks. The concept of NPL has been defined differently by many authors; one of them is the International Monetary Fund (IMF), which defines it, as “Loan would fall under the non-performing loan when the payment of its principal and interest had passed the due date by the period of three months or ninety days or more”, (Dimitras et al, 2016). Despite having a clear definition for the NPLs, “Banks are assumed to react differently to NPLs ratios above or below a threshold, with NPLs above , the threshold has an adverse effect on lending (Tracey, 2011). Commercial banks are playing a major role and have the largest share in the economy. Loans and advances are the main business assets and sources of revenues (income) for the commercial banks should be well-managed (Kipyego and Moses, 2013). The commercial banks may be exposed to credit risk due to mismanagement of loans and advances that are given to their customers and clients which may lead to reduction in the profitability of the banks (Ali, 2013). Therefore, this study is concerned with case of Saudi Arabia’s commercial banks. The paper is organized as follows: the following section deals with the statement of the problem Section three traverses the different varieties of literature that related to NPLs, then comes research methodology and in the last section provides a summary of the findings and the major challenges to addressing the NPLs problem, while concluding remarks are given in the same section of this paper.

## 2. Statement of the Problem and Theoretical Foundation:

The non-performing loans growth involves the necessities of provisions for loans and advances losses, which reduces the overall profits and weaken structure. The issues and problems of NPLs of commercial banks had been discussed at length by experts and financial specialists for so many decades in many countries with developed and developing economies. The problem of NPLs is not only affecting the banks' specific factors but also the whole banking industry and the macroeconomic factors. As a matter of fact, a high percentage or level of NPLs in commercial banks is nothing but a reflection of the state of mismanagement of the commercial banking structure. This study is to assess the NPLs and their effects and causes to the profitability of commercial banks in the Kingdom of Saudi Arabia (KSA).



The existence of high percentage of NPA is very acute issue for the banks, their continuity and sustainability. Thus, “the increase in the level of gross non-performing loans causes a great risk to banks, the financial sector and the economy at large” (Kaaya and Pastory, 2013). The acuteness of NPL arises when banks are forced to keep aside provisions for meeting the potential NPL, “the Non-performing loans normally results in high provisioning which leads to drop in profit for many banks” (Kithinji , 2010). The effect does not end here, it continues to “minimize the banks sector’s ability to play its role in the development process (Karim et al, 2010). Banks are expected to contribute in the development and growth of the banking system and economy thus “experiencing a high level of NPL may threaten the stability of the banking industry and the financial system as a whole “(Boudriga, et al (2010). Therefore, a careful selection of the proposed clients when lending should be there, this is because “an adverse selection leads to whereby high-quality borrowers are displaced by low quality borrowers which in the long run cause deterioration in the overall quality of bank loan portfolio and lead to accumulation of non-performing loan, decrease in profitability and erosion of capital” (Bofondi and Gobbi, 2003); (Bofondi and Ropele 2011, Makri, et al, 2014). in most of the cases , it is assumed that the NPLs affect the profitability of the banks as banks need to cover up with provisions the loss incurred due to borrowers defaulting. Ahmed and Ariff (2007) confirms by stating that “a high level of NPA reflects the high probability of loss and net worth get affected due to large number of credit defaults and similarly low level of NPL reflects the high probability of profit due to low credit default”. “Blocking the income and compelling the bank to borrow which results in additional cost to the bank is all a result of NPL (Balasubramaniam, 2013). It is believed that “the issue relating to non-performing loans affect all sectors of an economy, however, the sectors that is most hit by this effect is the financial institutions such as commercial banks which as a large loan portfolio” (Bloem and Gorter 2001). The quality of an asset can also be revealed by NPL that acts as an indicator of the financial stability of the bank (Ranjan and Dhal, 2003). In addition to that, “the performance of banking sector is the symbol of prosperity and economic growth in any country or region” (Khan and Senhadji, 2001).

The supply of credit to public through loans plays an essential role in the development and acceleration of economic growth, depending on the level of credit supply, the effect appear. Funso et al; (2012) states that “the extent to which a bank extends credit to the public for productive activities accelerate the pace of the nation’s economic growth and its long term sustainability”. Other causes have been described by (Adhikari, 2007) as the absence of supervision and monitoring by the bank, lack of effective lender’s resources, weak infrastructure, and poor debt recovery strategies. This may lead to immediate bank failure as well as economic slowdown Akter and Roy (2017). Banks should have the ability to measure the credit risk. This measurement could be done either before giving the loan or after that. Because this measuring is considered a key step for minimizing the loan default and loan delinquency (Casey, et al., 2009) stated that evaluation of loans is considered “ a prerequisite development of the economy , this is because it enables efficient and smooth flow of saving



investment process (Rahman and Jahan 2018). The enforcement of evaluation measures is essential to ensure maximum effectiveness in the performance of the financial institutions and on top of them banks as their ability indicates the financial stability for nation (Kaaya and Pastory, 2013). Banks with good records in financial performance is generally attributed to the existence of competitive advantage a bank hosts. This may indicate the existence of a relationship between competitive advantage and the credit's performance of financial institution (Rozzani and Rahman, 2013).

When financial institution is described as competitive, it means a high ratio of profitability, high economic growth, and high level of debtor's payment and finally low percentage of non-performing loans (Das and Ghosh, 2007). Financial institutions work with various financial and products and services however loans are considered main output offered by them which is considered a risky output (Panta, 2018). Empirical studies have disclosed that the financial crises main cause is the massive accumulation of Non-performing loans (Fafack, 2005). The reports have showed that, the NPLs were the reason for the collapse of over 60 banks during the 1997 Indonesian/Asian financial crises (Caprio and Klingebiel, 1999). The financial institutions could face many difficulties when serving loans and on top of them is their inability and uncertainty to observe the features and actions of borrowers making it a bit challenging to evaluate creditworthiness of the borrowers (Ariccia, 1998).

Back to history, it could be noted that, the ratio of NPL in the banking system has declined from 13.6% in 1998 to 2.8% in 2008 (Murthy et al., 2017). Non-performing loan is a risky asset and it leads to insolvency of banks and major effect on economy as a whole. In the year 1998 to 1990, three commercial banks collapsed in Benin as 80% of the bank's portfolio was NPL. A similar scenario took place in Cameroon when about 60-70 of the bank's loan portfolio was NPL leading to collapsing of five banks and restricting of three (Ugoani, 2016). It is recommended that a financial institution must have an effective system for managing disbursement of loans and their recovery; this is because the interest rate on the loans is estimated to be 85% of the bank's income (Reed and Gill, 1989). This is considered a precaution for more protection of the bank's main source of income. A focus and an utmost care should be targeted towards areas such as management, sound credit policy, credit analysis, loan quality, fraudulent practices and unhealthy competition (John, 2018). Recently, the issue of NPLs has been alarming not only in the developing countries but also in the developed countries (Akter and Roy, 2017). Consequently, to ensure maximum output and better performance of the banks, there is a need for concentration on the horizon of maturity of credit, better credit culture, and favorable macro-economic and business conditions to ensure the lowest rate of NPLs (Ranjan and Dhal, 2013).

However, this negative relationship could exist because of the poor enforcement of laws relating to settlement of NPLs followed by insufficient debt recovery measures on the bank's side (Adhikari, 2007). Banks that operate with ineffective loans classification system could

be a source of bad or default loans (Mulafra, 2015). Acquiring good management practices shall maintain a high level of solvency ratios that enables banks to cover risky assets (Alexandri and Santoso, 2015). NPLs is recommended to be used as an indicator for banks performance, banks adopting NPLs as performance indicator will greatly improve their performance (Liu et al; 2017). To conclude, the above discussion and inferences, the study attempts to investigate the relationship between the nonperforming loans (NPLs) bank specific and macroeconomic factors such as return on assets (ROA), capital adequacy (CAR), growth gross domestic products, bank liquidity and credit risk in the Saudi banking sector.

### **2.3 Objectives of the Study:**

The main objective of this study is to assess the present situation of non-perforating loans in banking sector and the effect of non-performing loans (NPLs) on bank's specific factors that related to the twelve commercial banks in the Kingdom of Saudi Arabia (KSA), while the secondary objectives with this study are as follows:

- (i) To study and analyze the common causes for loans to become non-performing in banks. Furthermore, it explored and identified specific steps that bank officers have to deal with the problems.
- (ii) To identify and explore the significance the current situation of profitability of the commercial banks for year 2009 to 2018.
- (iii) To raise some issues and observations those need to be looked upon for ensuring financial soundness.
- (iv) To give suggestion based on findings of the study and a set of remedial controlling measures through logical arguments.

## **2. Previous Empirical and Non-Empirical Studies**

This section provides a brief review of the theoretical as well as the empirical studies that explores of default loans, a few of them had been selected from various parts of the world to have a widespread conclusion about it. Krueger and Tornell (1999) studied the financial crisis in Mexico and the credit crunch and increased level of NPA. They explained that the bail-out policy adopted in 1995 could not resolve the problem of non-performing assets in the banking sector. Based on the analysis, the authors explained that non-performing assets is unlikely to disappear on their own even under a high growth scenario. Also, they called for an alternate strategy under which all non-performing assets were recognized at once and the fiscal costs were all paid up-front as preferable to solve the issue of the non-performing assets in the banking sector.

Woo (2000) investigated the creation of AMC and the development of out of-court centralized corporate debt workout framework to manage nonperforming assets accounts. His study also cautioned that there are some inherent weaknesses in the two approaches which were used to solve the causes of NPAs due to their dependence on government involvement



during the Asian financial crisis in the years 1997/1998. In an analytical study on the relationship between bank ownership and non-performing assets with reference to the Taiwanese banks, Hu, et al (2004) utilized statistical data of forty commercial banks during 1996-1999. The analysis revealed that the rate of non-performing assets decreases when government shareholding in a bank goes higher up to 63.51 percent, while thereafter it increases. They also found that the banks' sizes are negatively related to the rate of NPA. A notable finding of the study is that banks established after deregulation, in average, have lower rates of NPA than those established before deregulation. Dongili and Zago (2005) studied the relationship between defaulted loans and financial efficiency of the Italian commercial banks. They used a statistical technique to validate the claimed that problem loans are financial stress to commercial banks, and a strong relationship was found between the non-performing assets and economic efficiency of the concerned banks. Also, the results indicated that once problematic loans are seriously taken into consideration, and then the economic efficiency of banks increases significantly, which suggesting that a significant aspect of banking production, credit quality, needs to be considered when evaluating banks' performances.

And in order to study the significance of the non-performing assets in the Bangladeshi banking sector, Adhikari (2007) examined the behavior non-performing assets statistics from 2000 to 2005. The results of his research highlighted the presence of the alarming level of non-performing assets in both nationalized commercial banks and in the development financial institutions. The analysis revealed that poor enforcement of laws relating to settlement of NPA, followed by insufficient debt recovery measures on the part of the banks, has aggravated the financial malaise. The research suggested prevention of the flow problem of bad loans accompanied by other resolution measures to sort out the NPA mess in Bangladeshi banking sector.

In another descriptive study on non-performing assets in German banking sector, Rottke and Gentgen (2008) examined workout management of non-performing assets using a formal model based on transaction cost economics. The authors approached the non-performing assets problem from an academic standpoint, integrating both the banking and the real estate perspective. The results of the study indicated that the specificity of the investment of the workout manager is crucial for the decision of integrating or disintegrating the workout of real estate loans. The degree of specificity required to perform the workout tasks is dependent on the status of underlying credit engagement and the characteristics of the collateral. While, Espinoza and Prasad (2010) investigated NPAs in the 80 commercial banks in the Gulf Corporation Council; the study examined the effect of global financial crisis on non-performing assets. The authors estimated a macroeconomic panel by applying Vector Autoregression (VAR) in order to discuss the potential feedback effects of bank performance on the supply of credit and growth. The results of the study highlighted a strong and significant inverse relationship between real (non-oil) gross domestic product and nonperforming loans.





From among bank's factors, efficiency and past expansion of the financial statement namely the balance sheet was found to be significant. The research study suggested that a stronger focus on regulation, particularly through capital adequacy ratio and liquidity buffers, and countercyclical provisioning, that could help mitigate the effect of macroeconomic factors' risks to the banking industry.

The study was done by Kingu et al (2018) who investigated the effect of NPL on bank's profitability in the commercial banks of Tanzania. Their study revealed a negative relationship between the NPA and profitability of the Tanzanian commercial banks. Panta (2018) investigated the bank specific and macroeconomic determinants of non-performing loans as well as its impact on profitability. He found that the net interest margin and size of the bank are considered the major determinants of non-performing loans. Then Rajha (2016) investigated the determinants of non-performing loans in the Jordanian Bank sector and revealed that the economic growth and inflation rate have a negative and significant effect on non-performing loans. Another one was conducted by Alexandri and Santoso (2015) which analyzed the influence of internal and external banks factors on the level of non-performing assets in the regional development bank in Indonesia, and they findings disclosed a positive and significant effect between the ROA and NPA.

Furthermore, Kaaya and Pastory (2013) examined the relationship between bank performance and credit risk of commercial banks in Tanzania and revealed a negative relationship between profitability and credit risk. The study of Madishetti and Rwechungura (2013) also attempted to test the correlation between the credit risk and the Tanzanian commercial banks profitability; their study revealed that an increase in the NPL reduces the profitability level. Boahene et al., (2012) attempted to analyze the correlation between commercial banks profitability and credit risks in Ghana. Their study revealed a minimal effect on the profitability. Shingjergji (2013) investigated the relationship between bank specific factors and the non-performing loans ratios; the result showed that a capital ratio is negatively related but statistically insignificant. In another study that was carried out by Roman and Tomuleasa (2013) who examined the effect of internal and external factors on the profitability of banks in the EU countries. The study found that there is a negative relationship between NPL and profitability. Kolapo et al (2012) also analyzed the impact of credit risk on the Nigerian commercial banks profitability, their result showed that an increase in the non-performing loans leads to reduction in the bank's profitability. Saba, et al., (2012) studied the determinants of non-performing loans for the US Banking sector and found that all the selected independents variables have a significant impact on the dependents variables.

The case of Tanzania was investigated by Mwakajumilo (2014) who examined the assessed the effect of non-performing assets on the banking industry growth namely NMB bank. The research indicated that the effect of non-performing assets facilitated by non-timely recovery of credit, hence caused great harm to the economic framework and structure, loss of trust of



dishonest, reduced customer ability in buying, legal issues, lack of aggressive credit collection policy, poor credit assessment. The study highlighted many specific steps were taken by bank managers to avoid drastic downfall and the recovery of crisis with meaningful suggestions for financial stability. The study recommended that the bank management have to provide enough education on loan management to their clients as well as their workers. The commercial banks also have to ensure that sufficient and quality staffs are trained so as to perform their duties.

In another study that was done by Kargi (2011) who studied the connection between the profitability and credit risk and concluded by showing a negative connection between the credit risk and profitability of the Nigerian commercial banks. Louzis, et al (2011) investigated the factors causing the non-performing loans in the Greek banking sector, their result reported that the economic growth, unemployment, lending rates, public debt and management quality are the main determinants of NPL in the Greek banking sector. Vogiazas and Nikolaidou (2011) studied the determinants of non-performing loan in the Romanian banking sector during the Greek crises; their findings showed that the construction, investment expenditure, unemployment, inflation rate, Romania's external debt to GDP and money supply influence the credit risk of country banking system. The study of Karim et al (2010) attempted to examine the relationship between banks efficiency and non-performing loans in Malaysia and Singapore. It found that once the NPL increases, the bank's cost efficiency reduces resulting in profitability reduction. Berge and Boye (2007) revealed that there is a high relationship between rate of lending, unemployment and the NPA in the Nordic banking system. Hu et al., (2006) did a research on the relationship between NPL and the ownership structure of commercial banks in Taiwan. Their findings revealed that banks with higher government ownership recorded lower non-performing loans .it further reported that the bank size has a negative relationship with NPL. Podpiera and Weill (2008) examined the relationship between NPL and cost efficiency in Czech banking industry, their output revealed that there is a strong relationship between bad management and NPL. Rinaldi and Sanchis-Arellano (2006) reported in his study that the disposable income, unemployment and money conditions are major determinants of NPLs in European countries. Salas and Saurina (2006) studied the factors leading to NPLs in Spain and found that the high interest rate, GDP growth and soft credit conditions determine NPLs. While, Berger and De young (1997) applied the Granger-causality techniques so as to examine intersection between the problem loan literature and the bank efficiency literature. it was reported that poor management in banking institutions lead to loans of bad quality that eventually contribute to increasing number of bad loans or the so-called nonperforming loans which finally impact the profitability of the banks.

From the above reading, it could be concluded that most of the studies conducted in different parts of the world had a negative relationship with NPLs to some extent depending on the on the variables selected for the study also, the results of their study are ambiguous concerning



whether or not researchers should control for problem loans in efficiency estimation and there were studies that are related to the Kingdom of Saudi Arabia (KSA).

### 3.2 Hypotheses of the Study:

Based on the foresaid literature and variables that are related to the Saudi commercial banks and for fulfilling the objectives of the study, the following hypotheses are assumed:

- H<sub>01</sub>: There is a negative relationship between nonperforming loans (NPLs) and bank liquidity risk (BLIQ) and the credit risk (CRISK).
- H<sub>02</sub>: There is a negative relationship between NPLs and growth gross domestic product (GGDP) and inflation (INF) as macroeconomic indicators.
- H<sub>03</sub>: There is a negative relationship between NPLs and return on assets (ROA).
- H<sub>04</sub>: There is a negative relationship between NPLs and capital adequacy (CAR).
- H<sub>05</sub>: There is a negative relationship between NPLs and the size of the bank (SIZE).

## 4. Methodology of the Study:

### 4.1 Data Collection:

The study is a descriptive and an analytical one; it is based on the secondary data collected from various resources such as the commercial banks' financial statements, reports and previous empirical studies. The sample of the study included all banks operating in the kingdom of Saudi Arabia. The scope of the study purposively covered the period from 2009 to 2018 post to the global financial crises that took place in the year 2008 to test the effect of non-performing loans on selected banks specific factors i.e. (Liquidity, Return on Assets, and Capital Adequacy Ratio) during that period. The investigation is done by adopting a causality research design and deductive research strategy. The research uses Descriptive Statistics, Correlation, Regression and tools to test the relationship, OLS and Granger casualty tests.

**Figure 1:** The Relationship among the Variables of the Study



Source: Developed by the authors

The above-mentioned figure no. 1 presents the claimed relationship among the used variables (bank specific-variables and macroeconomics as external factors) of the study, therefore.

**Table 1:** Description of Variables

Type of variable	Acronym	Definition	Measurement	Expected Sign
Dependent Variables	NPLs	It is used as an indicator for credit risk.	NPL= Non-performing Loans / Total Loans and Advances.	negative
Independent Variables	ROA	It is employed to measure the efficacy of the bank.	Return on Assets Ratio = Net profit / Total Assets.	negative
	CAR	A bank who maintain high capital may do better	Total equity / Total assets	negative
	GGDP	Gross Domestic product Growth Rate.	Annual gross domestic product growth Rate.	negative
	BLIQ	The proportion of highly liquid assets held by financial institutions.	Liquid assets/ total assets	negative
	CRISK	the possibility of a loss resulting from a borrower's failure to repay a loan	Loans & advances /Deposits	negative
	SIZE	The higher the total asset, the greater is the potential of income generation	Natural algorism of total assets of the banks	negative
	INF	Inflation during the years of the study	Changes CPI	positive

Source: Prepared by the authors

## 5. Results and Discussion

### 5.1 Descriptive Statistics of the Study Variables

This part shows the result of the sample descriptive statistics, data such as mean, standard deviation, maximum, minimum and Kurtosis are described below:

**Table 2:** Descriptive Statistics of Variables

	NPLS	ROA	CAR	BLIQ	CRISK	SIZE	GGDP	INF
Mean	0.13229	0.01808			0.74315	25.5273	5.11800	0.00389
	0	2	0.159759	0.366635	0	0	0	9
Median	0.01535	0.01829			0.80726	25.6526	4.11000	0.02352
	5	8	0.142907	0.344211	6	6	0	6
Maximum	10.7272	0.03963			0.93284	26.8400	27.0800	0.03784
	6	7	0.901710	0.878728	1	2	0	4
Minimum	0.00000	-			0.00055	23.5743	-	0.18739
	0	0.014266	0.092527	0.240445	0	4	17.45000	5
Std. Dev.	0.98652	0.00723			0.20909	0.74779	13.6162	0.06247
	6	5	0.090241	0.090195	2	4	0	0
Skewness	10.4753	-			-	-	-	2.60639
	6	0.544805	5.889926	2.558407	2.570485	0.481265	0.043123	6
Kurtosis	112.765	6.69623			8.87261	2.69794	2.14854	8.22521
	8	3	43.86281	12.72006	7	4	9	0
Jarque-Bera	62437.3	74.2469			304.586	5.08851	3.66203	272.380
	3	4	9042.672	603.3067	1	5	4	1
Probability	0.00000	0.00000			0.00000	0.07853	0.16025	0.00000
	0	0	0.000000	0.000000	0	1	1	0
Sum	15.8748	2.16988			89.1780	3063.27	614.160	0.46792
	0	4	19.17111	43.99622	3	6	0	0
Sum Sq.	115.814	0.00622			5.20260	66.5444	22062.7	0.46439
Dev.	7	9	0.969075	0.968077	3	0	0	4
Observations	120	120	120	120	120	120	120	120

Source: Computed by the authors using E-views 10 Software

Table 2 shows the summary of the descriptive statistics of variables that were considered in the study i.e. (NPL, ROA, CAR, BLIQ, CRISK, SIZE, GGDP and INF). It shows the mean value of NPL, ROA, CAR, BLIQ, CRISK, SIZE, GGDP, and INF as (0.132290), (0.018082), (0.159759), (0.366635), (0.743150), (25.52730) (5.118000), (0.003899) respectively. Among

all variables, the standard deviation of the GGDP was considered the highest one with value of (13.61620) and probability value of (0.160251). The GGDP had the maximum and minimum values among other variables with (27.08000) and (-17.45000) respectively. It's also indicated that the result of Kurtosis test as normal. Data set is said to be normal if it's greater than one and abnormal if it is less than one. The number of observations of the study were also shown as 120.

## 5.2 The Correlation Analysis

**Table 3:** Correlations among Variables

	NPLS	ROA	CAR	BLIQ	CRISK	SIZE	GGDP	INF
NPLS	1.00000	-	0.07753	-	-	-	-	0.02948
ROA	0.04253	1.00000	0.11493	0.19509	0.15403	0.55388	0.00105	0.03019
CAR	0.07753	0.11493	1.00000	0.36024	-	-	-	0.15572
BLIQ	0.08925	0.19509	0.36024	1.00000	0.06002	0.04734	-	0.31699
CRISK	0.40368	0.15403	-	0.06002	1.00000	0.14289	-	0.08149
SIZE	0.06870	0.55388	-	0.04734	0.14289	1.00000	-	0.10893
GGDP	0.02834	0.00105	-	-	-	-	1.00000	0.61038
INF	0.02948	0.03019	-	-	-	0.10893	0.61038	1.00000

Source: Computed by the authors using E-views 10 Software

Table 3 shows the results of the matrix correlation among the study variables, this study results were obtained from using Pearson correlation of 2-tailed significance. First, the NPLs analysis is shown with other dependents variables. The table displays that the NPLs has a negative weak relationship with ROA, meaning an increase in the NPLs will lead to decrease

in the ROA by (-0.042533). It also indicates that, there is a weak positive relationship between the NPLs and the CAR by (0.077535), this is obvious as once the NPLs increases there will be a need to put more provisions to cover the bad debts. The relationship between the NPLs and the GGDP is also proved as a negative one , this is because if the NPLs increases, this means there will be a decrease in the GGDP by (-0.028340) , meaning a slowdown in the economy leading to low growth in it in addition to increase in the unemployment in the country. The table further indicates a negative insignificant relationship between the NPLs and the bank liquidity risk; this is because an increase in the NPLs will lead to reduction in the liquidity by (-0.089254). The negative relationship between the credit risk and the NPLs is also confirmed, it was showed that an increase in the NPLs will results in reduction deposit available in the banks by (-0.403682). The table also showed a positive weak connection between the ROA and CAR, GGDP, BLIQ and CRISK. It further disclosed a positive relation between BLIQ and the CRISK. The relationship between GGDP and the BLIQ and the credit risk was found to be a negative weak. Finally, the banks CAR along with GGDP and credit risk were reported as negative.

### 5.3 The Regression Analysis

The regression analysis is a tool used for in many fields including management and social sciences. It is employed to test the relationship between different independents and dependent variables. It aims at finding the effect of independents variables on other dependents ones and what type of relationship is there.

Table 4: Regression Analysis

Dependent Variable: NPLS

Method: Panel Least Squares

Sample: 2009 2018

Periods included: 10

Cross-sections included: 12

Total panel (balanced) observations: 120

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.237549	3.891245	1.088996	0.2785
ROA	10.69622	15.40057	0.694534	0.4888
CAR	-0.549203	1.199756	-0.457762	0.6480
BLIQ	-0.572954	1.101008	-0.520390	0.6038
CRISK	-1.992311	0.439991	-4.528070	0.0000
SIZE	-0.097416	0.155414	-0.626815	0.5321
GGDP	-0.006969	0.008108	-0.859508	0.3919
INF	0.553268	1.871513	0.295626	0.7681
R-squared	0.176737	Mean dependent var	0.132290	

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Adjusted R-squared	0.125284	S.D. dependent var	0.986526
S.E. of regression	0.922661	Akaike info criterion	2.741230
Sum squared resid	95.34591	Schwarz criterion	2.927063
Log likelihood	-156.4738	Hannan-Quinn criter.	2.816698
F-statistic	3.434870	Durbin-Watson stat	2.136596
Prob(F-statistic)	0.002294		

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Source: Computed by the authors using E-views 10 Software

Table 4 shows that the constant variable stands with a coefficient of 4.237549 which indicates that if all the explanatory variables in the employed model are kept constant, non-performing loans (NPLs) will still remain in an increase level on an average of (4.23%). This constant term is showed significant with P. Value of less than (5% level of significance i.e. 0.132290). The connection between the NPLs and ROA is showed positive, meaning an increase in the level of NPLs by one unit will result in an increase in the ROA by (10.69622) which is an absurd result. This result is also not significant as the level of significance i.e. (0.4888) is showed greater than (5%), the table also discloses a negative and weak relationship between the NPLs and the CAR with value of (-0.549203), this could be explained as any increase in the level of NPLs will lead to decrease in the CAR which is logical as banks will need to keep more provisions for covering the defaulted clients. Despite having a negative relationship, the level of significance (p. value) is showed greater than (5%). The table further reports a weak and negative relationship between NPLs and GGDP that means an increase in one unit of the NPL shall lead to a reduction in the level of GDP by (-0.006969), this is also understandable because an increase in the NPLs will make banks incapable of carrying out their activities affectivity which lead to limiting investments in the economy, this relation is showed as insignificant with p. value of (0.3919). In addition, the relationship among the NPLs and BLIQ is showed as negative and weak, meaning an increase in the NPL shall result in an increase in the BLIQ of (-0.572954) with a level of significance was also reported greater than (5%) with P. Value of (0.6038). finally, the CRISK indicated a negative connection between the CRISK and the NPLs (-1.992311) but the level of significance is reported less than 5% of significance of p-value @1% (0.0000), this indicates that an increase in one unit of the NPLs will lead to a reduction in the CRISK. The inflation has a positive coefficient of (0.553268) with a P-value of (0.7681) which is more than 5%.

**A) F-statistics:** This shows the complete significance of variables and it is also used as measure of goodness of fit of the model. With the help of 95% confidence interval and (118) degree of freedom, the value of the table is showed as (2.31). In our result, the F statistics is disclosed as (3.434870) which are higher than the table. This means the null hypothesis is rejected and alternative is accepted, concluding that the joint influence of included explanatory variables is significant and therefore cannot be ignored in explaining variations in the bank performance concerning the non-performing loans in the Saudi banking sector.





**B) R-squared:** This is the explanatory power of the variables of the study, the coefficient of the ( $R^2$ ) in the study is showed as (0.176737), this means (17.6737%) of the variations in the banks are accounted by the included bank specific and macroeconomic variables i.e. (ROA, CAR, GGDP, BLIQ, and CRISK).

**C) Durbin-Watson Statistics:** This test shows the correlation among the members of series of observations ordered in time. It is adopted to examine the availability of autocorrelation. The value of the Durbin Watson in the study is reported as (2.1365), which is in the range of 1.5 to 2.5 indicating the normality of data.

## **6. Interpretation of the Results and Concluding Remarks:**

This study assesses the effect of NPLs on the specific factors of Banking sector in the Kingdom of Saudi Arabia that are measured on CAR, BLIQ, NPLs, ROA, SIZE, economic growth and inflation. The study examined a sample of twelve commercial banks that are listed in the Saudi Stock exchange and are also registered with the Saudi Arabia Monetary Authority (SAMA). The findings of the study revealed that the default loans (non-performing loans) have a negative and weak relationship with ROA and liquidity. It also indicated a positive relationship between the NPLs and CAR. It further indicated a positive relationship between ROA and capital adequacy and as positive weak relationship and significantly positive with liquidity. The study also reported a significant positive correlation between capital adequacy and liquidity.

## **7. Further Scope of Research:**

The model parameters i.e. bank-specific and macroeconomics factors explained the variations in the nonperforming loans and advances well for all the Saudi Arabia's commercial banks with R-squared value of 17% only which is too low. There might be some missing other factors not included in the model that can better explain the behavioral of NPLs in the Kingdom; therefore, further research can shed the light in such gray area.



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## Appendix

Table no. 5. - Covariance Analysis: Ordinary  
Sample: 2009 2018  
Included observations: 120

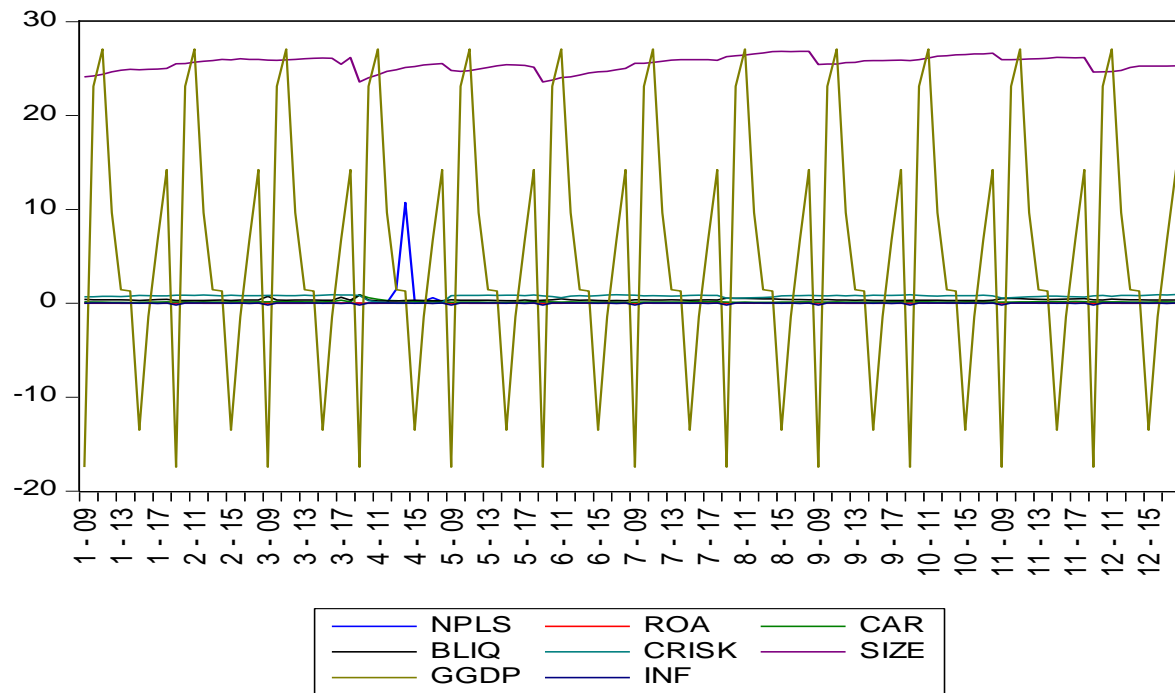
Covariance	NPLS	ROA	CAR	BLIQ	CRISK	SIZE	GGDP	INF
Correlation								
t-Statistic								
Probability								
NPLS	0.96512 3 1.00000 0 ----- ----- -							
ROA	0.00030 15.19E-05 -							
CAR	0.04253 3 -	1.00000 0						
BLIQ	0.46244 1 0.6446	----- -----						
CRISK	0.00684 57.44E-05 0.07753 5 0.84478 7 0.3999 -		0.00807 6 1.00000 4 0 1.25683 5 ----- -----					
SIZE	0.00787 6 -	0.00012 6	0.00290 8	0.00806 7				
GGDP	0.08925 4 -	0.19509 3	0.36024 0	1.00000 0				
INF	0.97342 6 0.3323 -	2.16077 1	4.19484 6	----- -----				
	0.08257 5	0.00023 1	0.00531 0	0.00112 3	0.04335 5			



	-	-	-	-	-	-	-	-
	0.40368	0.15403	0.28379	0.06002	1.00000			
	2	0	2	2	0			
	-	-	-	-	-	-	-	-
	4.79300	1.69340	3.21494	0.65318				
	1	4	5	0	----			
	0.0000	0.0930	0.0017	0.5149	----			
	-	-	-	-	-	-	-	-
SIZE	0.05026	0.00297	0.02033	0.00316	0.02215	0.55453		
	5	2	5	7	6	7		
	-	-	-	-	-	-	-	-
	0.06870	0.55388	0.30386	0.04734	0.14289	1.00000		
	8	0	8	3	3	0		
	-	-	-	-	-	-	-	-
	0.74812	7.22639	3.46468	0.51485	1.56830			
	9	4	2	7	6	----		
	0.4559	0.0000	0.0007	0.6076	0.1195	----		
	-	-	-	-	-	-	-	-
GGDP	0.37751	0.00010	0.01024	0.07431	0.25810	0.56902	183.855	
	1	3	9	8	5	8	8	
	-	-	-	-	-	-	-	-
	0.02834	0.00105	0.00841	0.06102	0.09141	0.05635	1.00000	
	0	7	1	3	9	5	0	
	-	-	-	-	-	-	-	-
	0.30797	0.01148	0.09137	0.66411	0.99724	0.61314		
	5	6	0	7	3	3	----	
	0.7586	0.9909	0.9274	0.5079	0.3207	0.5410	----	
	-	-	-	-	-	-	-	-
INF	0.00180		0.00087	0.00177	0.00105	0.00504	0.51487	0.00387
	21.35E-05		1	1	6	7	0	0
	-	-	-	-	-	-	-	-
	0.02948	0.03019	0.15572	0.31699	0.08149	0.10893	0.61038	1.00000
	4	4	9	4	0	6	8	0
	-	-	-	-	-	-	-	-
	0.32041	0.32813	1.71253	3.63068	0.88815	1.19043	8.37078	
	6	7	8	1	6	7	4	----
	0.7492	0.7434	0.0894	0.0004	0.3763	0.2363	0.0000	----

Source: Computed by the authors using E-views 10 Software

**Figure 2:** Graph Analysis



**Sources:** developed by the authors using E-views 10 Software