

EFFECT OF CREDIT MANAGEMENT ON PROFITABILITY OF DEPOSIT MONEY BANKS IN NIGERIA

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Abstract

Despite the reported importance of credit risk management on profitability of firms in the literature, there still exist a gap to be filled, as very few studies have empirically examined the relationship between credit risk management and profitability, especially in developing economies like that of Nigeria. Consequently, this study examined the effect of credit risk management on the profitability of deposit money banks in Nigeria using non-performing loans, loan loss provision and growth in interest earnings on loans and advances as proxies for credit risk management. Therefore, for a period of 5 years, between 2015 and 2021, the impact of these proxies on the profitability of deposit money banks was analyzed in this study using correlation and regression analysis processed on STATA 13 statistical software. Three hypotheses were formulated in null form and were tested by the study. Based on the empirical analysis, the study found a positive non-significant relationship between non-performing loans and profitability. The study also found a positive insignificant relationship between loan loss provision and bank profitability. On the contrary, the study found a negative but significant relationship between growth in interest earnings on loans and advances and the profitability of deposit money banks. Therefore, it is recommended that given the current supervisory and regulatory policy frameworks for banks, credit risk managers should be less concerned with adjustments in the ratios of non-performing loan and loan loss provision as the values of these ratios have no significant effects on performance but should instead be more prudent on the management of the growth in interest earnings on loans and advances as it has a significant effect on performance.

Keywords: Non-performing loans, Loan loss provision, Interest earnings, credit risk management, profitability.

Introduction

The increased competition associated with the process of capitalization, liberalization and globalization and the attempts of Nigerian banks to increase their presence in other markets may have affected the efficiency and credit risk of the Nigerian banking institutions. The first of these aspects, already analyzed in other studies, is based on the incentive to the banks to reduce costs and to improve the management of their resources in order to gain competitiveness. The second aspect, which has not yet been analyzed, is explained by the poorer knowledge of the new markets by the newly entered banks and/or the greater permissiveness in the acceptance of risk with a view to increasing the market share in certain sectors and/or regions. Despite the importance of these two aspects, banking literature has usually analyzed banking efficiency without considering them together.

Credit risk is the possibility that the actual return on an investment or loan extended will deviate from that, which was expected (Conford, 2013). Coyle (2014) defines credit risk as losses from the refusal or inability of credit customers to pay what is owed in full and on time. The main sources of credit risk include, limited institutional capacity, inappropriate credit policies, volatile interest rates, poor management, inappropriate laws, low capital and liquidity levels, directed lending, massive licensing of banks, poor loan underwriting, reckless lending, poor credit assessment, no non-executive directors, poor loan underwriting, laxity in credit assessment, poor lending practices, government interference and inadequate supervision by the central bank. To minimize these risks, it is necessary for the financial system to have; well-capitalized banks, service to a wide range of customers, sharing of information about borrowers, stabilization of interest rates, reduction in non-performing loans, increased bank deposits and increased credit extended to borrowers. Loan defaults and non-performing loans need to be reduced (Basel Committee on Banking Supervision, 2006).

Deposit money banks employed different credit risk management policies majorly determined by; ownership of the banks (privately owned, foreign owned, government influenced and locally owned), credit policies of banks, credit scoring systems, banks regulatory environment and the calibre of management of the banks (Nworji, Olagunju&Adeyanju, 2011). Banks may however have the best credit management policies but might not necessarily record high profits. In addition, although there are industry standards on what is a good credit policy and what is not and further banks have different characteristics. The market may thus be seen to regard an individual banks' poor performance more lenient when the entire banking sector has been hit by an adverse shock such as a financial crisis. Banks may be forced to adjust their credit policy in line with other banks in the market where a herding behaviour is practiced by banks (Altman, 2018). Looking at the emphasis that is laid on credit risk management by deposit money banks the level of contribution of this factor to profits has not been analyzed. Petersen & Rajan (2012) notes that expanding lending in the short-term boosts earnings, thus the banks have an incentive to ease their credit standards in times of rapid credit growth, and likewise to tighten standards when credit growth is slowing.

In order to tackle the issues of credit risk management in the country, the Central Bank of Nigeria (CBN) entered into an agreement in 1987 known as Basel I and Basel II accords. Both accords emphasized the importance of capital adequacy for mitigating credit risks, which

cushions the effects of sudden financial losses on banks (Iwedi, & Onuegbu, 2014). Nawaz (2012), postulated that the magnitude of non-performing loans in the banking system eroded investors' confidence and alarmed stakeholders in the banking industry. Osuka, and Amako, (2015) posits that between 1999 and 2009, non-performing loans was critically high at and peaked at 35% in 2009 in deposit money banks in Nigeria. This excessively high level of NPL in the banks was caused by poor corporate governance practices, lax credit administration processes and the absence or non-adherence to credit risk management practices. A high level of NPL has a tendency to reduce the lending ability of deposit money banks and possibly put them out of business. Iwedi and Onuegbu, (2014) reported that the banking industry had been hit by low quality loan assets as a result of poor economic and financial conditions in the country following the Great financial recession of 2008 and the negative oil price shock. Low debt recovery hindered banks from extending further credit into the economy which adversely affected productivity.

In Nigeria, deposit money banks play an important role in mobilizing financial resources for investment by extending credit to various businesses and investors. Lending represents the heart of the banking industry and loans and advances are the dominant assets as they generate the largest share of operating income. Loans however expose the banks to the greatest level of risk. Many banks that collapsed in the late 1990's and up to the recent restructuring of the commercial banks in Nigeria were as a result of the poor management of facility which was portrayed in the high levels of non-performing loans. Looking at the emphasis that is laid on credit risk management by deposit money banks in the recent time, the level of contribution of this factor to profitability has not been well studied in the literature which called for this study.

More so, despite the stringent regulations put in place by the Central Bank of Nigeria and other regulatory bodies, the banking industry is still plagued with high credit risk in the form of non-performing loans. The rate of non-performing loans had its peak of 37.3% in 2009 and had a low rate of 3.0% in 2014 and it has been increasing consistently to the rate of 11.4% in 2018 (Central Bank of Nigeria, 2021). Credit management has often been a challenge to many deposit money banks in Nigeria, because, despite best practices measures in credit risk management put in place by the management of these banks, customers still have strong tendencies to delay or completely stop repayment of their loan, which often lead to problem of non-performing loans. Most researches considered by this study (e.g. Gadzo, Oduro, & Asiedu, 2021 ; Nwanna & Oguezue, 2017; Li & Zou 2014; Ndubuisi & Amedu, 2018; Ojiong, Okpa, Egbe, 2014) adopted data on credit risk management and profitability, obtained between year 2000 and year 2015, and they all emphasised that credit risk management have significant positive relationship with profitability of deposit money banks. The problem of this study is to identify whether any relationship still exist between credit risk management and profitability using data stating from 2015-2021, since none of the existing studies considered in this research work have fully adopted these period.

Credit risk management in this study will be measured using non-performing loans, loan loss provision and growth in interest earnings on loans and advances because of their reported importance on profitability (Ndubuisi & Amedu, 2018). However, despite their reported importance in the literature, very few studies have examined these three variables on

profitability in a single study. Most previous related studies (e.g., Gadzo, Oduro, &Asiedu,2021; Nwanna&Oguezue, 2017; Li & Zou 2014) examined just one or two of non-performing loans, loan loss provision and growth in interest earnings on loans and advances in their respective studies, amounting a gap in the body of knowledge. To fill this knowledge gap, this study examined the effect of non-performing loans, loan loss provision and growth in interest earnings on loans and advances on the profitability of deposit money banks in Nigeria.

Literature Review

Theoretical Framework

Commercial Loan Theory

The oldest theory of banking is the commercial loan theory, also called the real bills doctrine. The commercial loan theory holds that banks should lend only on short term, self-liquidating, commercial paper. According to Hosna&Manzura, (2009), the commercial loan theory is geared to influence persuasively both the bank lending and the general economic activities. Strict adoption of this theory will reveal that it is expected to serve as a monetary supply to changes in aggregate economic activity. The popularity of this doctrine among Deposit-Money Banks (DMBs) in Nigeria is evident. Nigerian bankers believe that since their resources were repayable at short notice, such depositors' monies should be employed accordingly in short-term loans.

Kargi, (2011) posited that the strong tie to this conception is rather orthodox if consideration is given to the fact that at the time of the supremacy of the theory, there were little or no secondary reserve assets, which could have served as a liquidity buffer for the bank. More so, this theory fails to consider the credit needs of Nigeria's developing economy. It has not encouraged banks to fund the purchases of plants, equipment, land, and home-ownership. For a theory to maintain that all loans should be liquidated in the normal course of business shows its failure to recognize the relative stability of bank deposits. Whereas, demand deposits are on demand, all depositors are not likely to demand payment at the same time. Thus, stability of deposits enables a bank to extend funds for a reasonable long period without danger of illiquidity. Though, with its flaws, the commercial loan theory, or real bills doctrine has been a persistent theory of banking. Vestiges of it still remain in the structure of bank regulatory agencies, bank examination procedures and the thinking of many bankers. One cannot understand contemporary banking without an understanding of our banking history, and cannot understand banking history without an understanding of the commercial loan theory.

Concept of Credit Risk

Donald et al. (1996) defines Credit risk simply as the potential that a bank borrower or counterpart will fail to meet its obligations in accordance with agreed terms. The goal of credit risk management is to maximize a bank's risk adjusted rate of return by maintaining credit risk exposure within acceptable parameters. Banks need to manage the credit risk inherent in the entire portfolio as well as the risk in individual credits or transactions. Banks should also consider the relationships between credit risk and other risks. The effective management of credit risk is a critical component of a comprehensive approach to risk management and essential to the long-term success of any banking organization. According to Nelson and

Schwedt (2006) the banking industry has also made strides in managing credit risk. Until the early 1990s, the analysis of credit risk was generally limited to reviews of individual loans, and banks kept most loans on their books to maturity. Today, credit risk management encompasses both loans reviews and portfolio analysis.

Concept of Credit Management

Credit management is an important issue in any organization and cannot be overlooked by any economic enterprise engaged in credit irrespective of its business nature. It is the process which ensures that customers will pay for the products delivered or the services rendered. Myers and Brealey (2003), describe credit management as methods and strategies adopted by a firm to ensure that they maintain an optimal level of credit and its effective management. It is an aspect of financial management involving credit analysis, credit rating, credit classification and credit reporting. Nelson (2002), views credit management as simply the means by which an entity manages its credit sales. It is a prerequisite for any entity dealing with credit transactions since it is impossible to have a zero credit or default risk. According to Hettihewa (1997), Credit Management is extremely important as granting credit is considered to be the equivalent of investing in a customer. However, payment of the debt should not be postponed for too long as delayed payments and bad debts are a cost to the company.

Concept of Non-Performing Loans

Non-performing loans are those loans that are not earning income and full payment of principal and interest is no longer anticipated, principal or interest is ninety days or more delinquent or the maturity date has passed and payment in full has not been made Hou and Dickinson (2007). Non-performing loans cause insolvency of financial institutions and ultimately hurt the whole economy by causing reluctance by banks to provide credit (Hou, 2007). In a high NPL condition, banks increasingly tend to carry out internal consolidation to improve asset quality which minimizes granting of loans. High level of NPLs require banks to raise provision for NPLs which decreases the banks' revenue and reduces the funds for new lending impairing the corporate sector as they have difficulties in expanding their working capital (Agung et al, 2001). Therefore, many banks focus on the corporate or wholesale lending, which poses a challenge for the management to maintain the required liquidity position (Akhtar, 2007).

Concept of Loan Loss Provision

As a result of the difficulties and crises facing banks recently, Loan Loss Provision (LLP) has a key role to strengthen the financial position of the banks. Beatty and Lioa (2009) define LLP as a policy that followed by commercial banks by putting some money aside (reserves) to face any potential loans default, which in turn would help to protect banks' positions in terms of profitability and capital. The main objectives of LLP is to provide special information about the bank's future (Kanagaretnam& Lobo, 2010); reduce taxes by earnings managing, and management of regulatory capital (Bouhekoua et al., 2012); managing the level of income volatility and the volatility of earnings (Norden&Stoian, 2013); and avoiding fluctuations which occur in risk-weighted assets that in turn affect the bank's risk and profitability (Norden&Stoian, 2013).

Concept of Interest Earnings on Loans and Advances

Interest rate is main tool of monetary policy and an important macroeconomic variable, which is positively linked with country's economic growth. Commonly, interest rate is said to be the cost of capital, means the price paid for money used over a certain time period. Banks as financial intermediary plays a vital role in operations of economic development and its efficiency can also influence the economic advancement. The financial services provided by banks are quite different from other financial institutions and in return bank charges interest. Depositors provide maximum amount of the funds and they receive interest in return. Interest margin is the difference between the interest paid and the interest received.

Empirical Review of Related Literature

Li and Zou (2014) carried out a study titled credit risk management and profitability of commercial banks in Asia. The statistical analysis was done using regression analysis. The findings of the study reveal that credit risk management have positive effects on profitability of commercial banks, and this was reflected in the analysis of the proxies of credit risk management and profitability such as; non-performing loan ratio, return on asset, return on equity which reveal positive relationship , while only capital adequacy ratio showed a negative and insignificant relationship, The study concluded that credit risk management has significant positive relationship profitability. It therefore, recommends that management of banks should put more effort on the control of none performing loan, because of its significant effect on profitability. However, despite, all the effort put in place by management of these banks, the problem of non -performing loan still continue to affect them.

Nwanna and Oguezue (2017) conducted a study titled Effect of Credit Management on Profitability of Deposit Money Banks in Nigeria. The study employed multiple regression analysis in Eviews 9. The findings of the study reveal that loans and advances and loan loss provision have positive and significant effect on profitability, while nonperforming loan has a negative and insignificant effect on profitability. The study concludes that management of banks should evaluate credit request before granting any form of loan to customer(s) to circumvent high rate of non-performing loan. It recommends that the banks should ensure that customers have verifiable guarantors and collateral before granting them loan. The rapid increase in Non-performing loan in most deposit banks shows that some deposit money banks may not be complying with guidance issued by regulating agencies in charge of loan facilities across the banks.

From the theoretical framework of the study and the empirical review of the study it is hypothesized that:

H₀₁: Non-performing loans has no significant effect on the profitability of deposit money banks in Nigeria.

H₀₂: Loan loss provision has no significant effect on the profitability of deposit money banks in Nigeria.

H₀₃: Growth in interest earnings on loans and advances has no significant effect on the profitability of deposit money banks in Nigeria.

Methodology

To achieve the set objectives, this study employs correlation research design in assessing the effect of credit risk management and the profitability of deposit money banks in Nigeria. This study focused on credit risk management and the profitability of deposit money banks in Nigeria, hence, forming the population of the study. However, this study will randomly select 10 deposit money banks in Nigeria as the sample size of the study. As at the time of this study, there are 21 deposit money banks in Nigeria. However, using filtering, this study will only consider deposit money banks with national authorisation in Nigeria. The source of data for this research is basically secondary source. This is due to the fact that the research approach to be adopted for this study is quantitative in nature. The main sources of secondary data for this study comprised of the statement of comprehensive income as well as the statements of financial position of banks in Nigeria which are extracted from the annual reports of their relevant financial years. Others include articles, journals and the Internet.

The following mathematical model was developed to analyze the relationship that exists between profitability and credit risk management as represented below:
 $Y = \beta_0 + \beta X_1 + \mu_{it} \dots \dots \dots (1)$

Where, Y represents the dependent variable. β_0 is constant, β is the coefficient of the explanatory variable (credit risk management), βX_1 is the independent variable and μ_{it} is the error term. Representing equation (1) above in an econometric model, equation (2) below therefore

becomes:

$$ROA_{it} = \beta_0 + \beta_1 NPL_{it} + \beta_2 LLP_{it} + \beta_3 GIE_{it} + \mu_{it} \dots \dots \dots (2)$$

Where:

ROA_{it} = Return on Asset of bank i at time t

NPL_{it} = Non-performing loans of bank i at time t

LLP_{it} = Loan Loss Provision of bank i at time t

GIE_{it} = Growth in interest earnings on loans and advances of bank i at time t

β_0 = constant

$\beta_1 - \beta_3$ = coefficient of the explanatory variables

A static panel regression model will be estimated to analyses the effect of credit risk management on the profitability of deposit money banks in Nigeria.

Measurement of the Variables

Variables	Measurement
Return on Asset (Profitability)	Profit after tax divided total asset
Non-performing Loans (NPL)	Percentage of non-performing loans out of total loans
Loan Loss Provision (LLP)	Percentage of loan loss provision out of total Loans
Growth in interest earnings on loans and advances (GIE)	Percentage of loans and advances to total Deposits

Data Analysis

Descriptive Statistics

Table 4.1

Descriptive Statistics

Var.	Mean	Median	Max.	Min.	Std.Dev.	Jarque-bera	Prob.	Skewness	Kurtosis	Obs.
ROA	2.0142	1.8608	5.5129	1.001	22.123	277.29	0.000	4.1105	21.601	50
NPL	0.1371	0.1179	0.3212	0.026	0.4018	2.341	0.177	0.3252	1.3187	50
LLP	0.0425	0.0356	0.4638	0.003	0.2232	437.80	0.000	4.0232	35.482	50
GIE	0.0819	0.0415	0.5428	0.006	1.5377	104.27	0.001	2.2561	13.051	50

Source:STATA 13 output, 2021

Table 4.1 shows the descriptive statistics of the relevant variables involved. It shows the total number of observations, mean, median, maximum, minimum, standard deviation, skewness, kurtosis and Jarque-Bera. The dependent variable which is return on asset (ROA) shows the minimum 1.001 which was observed in 2015 and shows the maximum of 5.5129 which was observed in 2021. The mean value of the dependent variable is 2.0142 and the standard deviation is 22.123, this implies that there was high fluctuation in return on asset for the years. It can also be observed from the table that the p-values for ROA, LLP and GIE are all zero indicating that the Jarque- Bera values are significant at all levels of significance and therefore we reject the null and conclude that AR, LGDR, NPLR and LLPR are not normally distributed. The skewness values for that ROA, LLP and GIE indicate that the variables have a positive skewness. The p-value for the variable NPL was greater than 0.05 indicating the Jarque-Bera value was insignificant and we therefore fail to reject the null and conclude that the NPL is normally distributed.

Unit Root Test

Unit root test was done to examine the variables employed on the study. It is used to check for the presence of a unit root i.e. whether the variables are stationary. It is also used to ascertain the regression technique to adopt for analysis and testing of hypotheses. This test is carried out using the Augmented Dickey Fuller (ADF) test.

Table 4.2

Unit Root Test

	ADF	CV@5%	Prob.	Inference
ROA	-7.05427	-1.70980	0.000	1(1)
NPL	-3.77672	-2.89306	0.010	1(1)
LLP	-5.45532	-2.89308	0.004	1(1)
GIE	-4.741	-1.70981	0.011	1(1)

Source:STATA 13 output, 2021

The Apriori expectation when using the ADF test is that a variable is stationary when the value of the ADF test statistic is more negative than the critical value at 5%. More so, the table shows a p-value of 0. This means that the ADF values are significantly less than zero ($p < 0.01$)

and therefore we reject the null hypothesis of a unit root in ROA, NPL, LLP and GIE panel in favour of the alternative that the panel is stationary at level.

Heteroskedasticity Test

Table 4.3
Heteroskedasticity Test: Breusch – Pagan Godfrey

F- statistics	0.33518
Probability Values	0.7338

Decision Rule

Accept that there is no heteroskedasticity when the probability value is greater than 5% otherwise accept that it exists. For the fact that the probability value is greater than 5%, it is therefore concluded that the study is free from heteroskedasticity. Thus no treatment was required for heteroscedasticity for the data in this study.

Test for Multicollinearity

Multicollinearity was tested by using the variance inflation factor (VIF) method. To find the R-Squared a regression analysis of each independent variable was done using the particular independent variable as a dependent variable and regressing it on all the other independent variables.

Table 4.4

“Dependent” Variable	NPL, LLP	LLP, GIE	GIE, NPL	VIF (critical vaule = 3)	inference
NPL	0.028241*			1.01	No collinearity
LLP		0.205148*		1.21	No collinearity
GIE			0.301402*	1.31	No collinearity

Where (*) indicate the adjusted R-Squared values of the “Dependent Variables”

From Table 4.4 it is evident that no variable suffered from excessive multicollinearity and therefore there wasn’t be any treatment for multicollinearity of the data in this study

The Hausman Test Results

The Hausman tests on whether the fixed or random effects model is suitable for the panel.

Table 4.5

Hausman Test

Correlated Random Effects-Hausman test				
Test cross-section and period random effects				
Test Summary	Chi-sq. Statistics		Chi-sq. d.f	Prob.
	Cross-section random	2.4532	3	
Period random	0.0621	3		0.8531
Cross-sect. and period sect.	2.2740	3		0.3842

From Table 4.5, all the p (Chi-Square statistics) of 0.3648, 0.8532 and 0.3845 for the chi-square statistics 2.4532, 0.0621 and 2.2740 respectively are greater than 0.05 (at 5% significance level) and therefore insignificant. This means that we fail to reject the null and therefore use the random effects model in this data.

Table 4.6 Panel Regression Results

Variables	coefficient	Std-Err.	T-stat.	Prob.
_CONS	0.6012	0.0519	7.0532	0.0000
NPL	0.0043	0.0262	0.2359	0.5406
LLP	0.0003	0.0004	0.8160	0.3182
GIE	-0.0030	0.0052	-2.4633	0.021
R²	0.23			
F-Stat²	1.47			
Prob. F-Stat²			0.0362	

This study adopted 0.05 significance level in interpreting the results. From the results (Table 4.6) the constant (C) was significant ($p < 0.05$) 5% significance level. The rest of the coefficients are explained below.

From the Table above, the functional relationship between the dependent and independent variables are ROA=0.6012, NPL = 0.0043, LLP =0.0003 and GIE= -0.0030. From the findings the t-test statistic of 0.2359 for NPL had a probability (p) value of 0.5406 (> 0.05) and therefore not significant at 5% significance level. Thus the study found a positive non-significant relationship between NPL and profitability proxy by return on asset. Hence, H01 that states that non-performing loans has no significant effect on the profitability of deposit money banks in Nigeria is empirically supported. This finding is different of that of Li et. al (2014) which

found a positive and significant relationship between non-performing loan and profitability. The difference in these results may be attributed to the differences in the actual variables used in the studies. Furthermore, the study also provide a t-test statistic of 0.8160 for LLP is insignificant at 5% ($p > 0.05$) significant level. Thus the study found a positive insignificant relationship between LLP and bank profitability. Consequently, H02 that states that loan loss provision has no significant effect on the profitability of deposit money banks in Nigeria is supported. This result differ from that of Nwannaet.al (2017) who found positive and significant relationship between LLP and profitability. Conclusively, the result also provides GIE having a t-stats of -2.4633 and a prob of 0.0121. Therefore, the study found a negative but significant relationship between GIE and ROA. Hence, H03 that states that growth in interest earnings on loans and advances has no significant effect on the profitability of deposit money banks in Nigeria is empirically rejected. The study does not support the findings of Ojionget.al (2014) and in agreement with Ndubuisiet.al (2018).

More so, model had R2 off 23%. The interpretation of the low adjusted R-squared value is that the model had low predictive power in using the independent variables to explain the dependent variable under this study and the remaining 77% was not captured in this study because there many factors that determines banks profitability. This implies that more or different predictor variables need to be used in the study. The F-statistic for the model was 1.47 and the p (F-statistic) of 0.0362 (less than 0.05) shows that the F-statistic was significant and therefore the model as a whole was significant in predicting bank performance.

Conclusion and Recommendations

Concerning the first objective of the study which was to determine the effect of non-performing loan and profitability, the study concluded that, at 5% significance level, non-performing has statistically no significant effect on bank profitability. On the second objective which was to establish the effect of loan loss provision on profitability, the study concluded that, at 5% significance level, loan loss provision has statistically no significant effect on bank profitability and on the last objective which sought to determine the effect of growth in interest earnings on loans and advances on bank profitability, the study concluded that, at 5% significance level, growth in interest earnings on loans and advances has a negative and statistically effect on bank profitability. From the findings, non-performing loan and loan loss provision did not affect bank profitability while growth in interest earnings on loans and advances had a negative effect bank performance for the period under study. Based on this, the study makes the following recommendations:

- i. Given the current supervisory and regulatory policy frameworks for banks, credit risk managers should be less concerned with adjustments in the ratios of non-performing loan and loan loss provision as the values of these ratios have no significant effects on performance but should instead be more prudent on the management of the growth in interest earnings on loans and advances as it has a significant effect on performance.
- ii. From a regulatory point of view and according to the study findings, it is recommended that the current regulatory policy requirements on non-performing loan and loan loss provision should be maintained as their results are uniform across the sample, while the regulatory growth in interest earnings on loans and advances should be adjusted in order to mitigate the negative effects,

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