



CAUSALITY BETWEEN FINANCIAL PERFORMANCE AND CREDIT RISK MANAGEMENT: EVIDENCE FROM DEPOSIT MONEY BANKS IN NIGERIA

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ABSTRACT

Credit risk management has become a critical concern affecting deposit money banks in Nigeria. Ineffective credit risk may be a serious factor contribution to poor performance of these banks, therefore, the causal nexus between credit risk management and the financial performance of deposit money banks is investigated from 2015-2024. Using audited financial data from 15 selected deposit money banks in Nigeria from 2015 to 2024. The study employ Dumitrescu–Hurlin (2012) Panel Granger Causality Test, the results are evident that loan provision ratio granger causes return on asset of the deposit money banks in Nigeria. The result indicates a bi-causal co-movement between the cash reserve ratio and the return on asset of the deposit money banks in Nigeria. Furthermore, the result suggest that only a uni-directional causality exist between the ratios of non-performing loans to the return on equity. Also, causality only moves from return on equity to the loan to deposit ratio. The study concluded that that loan provision ratio truly granger causes return on assets of the deposit money banks in Nigeria. This study recommends that to abate excessive risk taking, deposit money banks should strengthen their loan loss provisioning practices, maintain optimal liquidity and reserve balances and integrate profitability metrics into their credit risk management framework.

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1.0 Introduction

Financial institutions constitute a fundamental component of economic development by enhancing allocative efficiency within the financial system. They facilitate the transfer of funds from surplus economic unit, such as savers and lenders to deficit units possessing productive investment opportunities. At the cores of any financial system resides the banking sector, which serves as the principal mechanism for financial intermediation and stability. The intermediary role of banks is considered as the accelerator of credit that serve as a life blood for every organization to survival Naji et al. (2023). Without a well functional financial system, it is very difficult for an economy to reach its full potential. By distributing financial resources throughout various locations, depository institutions are critical in promoting financial stability and economic progress worldwide (Khan et al., 2023).

In the contemporary, rapidly expanding global economy, banks are widely recognized as the powerhouse of economic growth, owing to their crucial role in facilitating financial intermediation and promoting productive investment Magaji et al. (2020). Nonetheless, the banking sector is inherently exposed to series of risk, with credit risk representing the most critical and pervasive challenge. The long term viability and stability of banking institutions depend substantially on their capacity to identify, asses and mitigate the adverse effect associated with risk management.

The fact that the country's survivals depends on the banking sector requires great attention in ensuring its sustainability, especially from various risks that can disrupt the financial performance of banks. The profitability of a banking institution is intrinsically linked to the extent of efficiency with which it attains

its strategic objectives through the prudent utilization of its available resources Ardelia et al. (2023). As a cornerstone of the financial system, the banking sector warrants rigorous safeguarding, given that its instability or collapse can precipitate widespread diverse repercussions throughout the macroeconomic environment. Hence, the attainment of sustained profitability and operational efficiency in banking operations necessitates a comprehensive framework for the identification, assessment and effectiveness management of the risk inherent in the banking business. Thus, if banks are to achieve financial stability, they must use credit risk management practices to survive in a dynamic banking environment. The credit losses which make banks unable to pay depositors and other lenders amounts due to them. Evidence has been found that arbitrary loans disbursement and insiders abuses by the management and the board of directors of the banks also constituted critical problem facing deposit money banks in Nigeria. The major contributor to the distress of liquidated banks in Nigeria was their inability to collect loans and advances extended to customers and creditors, as well as companies related to directors or managers. The disbursement of loans by the management and board of directors of these banks were not based on the principles of lending rather on the interpersonal relations with families, friends, relatives and so on. The reality of such cases was evidenced where the Central Bank of Nigeria (CBN) ordered the replacement of Directors and Management of Skye Banks Plc due to liquidity concerns notwithstanding Audits by Big Audit firms (Magaji et al. (2020). Interestingly, liquidity ratio serves as a fundamental indicator of a bank's financial status and is critical to its overall success (Diamond and Rian, 2021), the availability of adequate liquid assets enables banks to manage crises more effectively and sustain

operational stability (Berger & Bouwman, 2019). However, liquidity challenges often arise from the deterioration of loan quality, which leads to credit losses and subsequently undermines a bank's capacity to meet its obligations to depositors and other creditors (Nikolaou, 2019). Empirical evidence indicates that indiscriminate loans disbursement practice and insider abuses by bank management and board of directors have also constituted significant challenges confronting deposit money banks in Nigeria. (Adegbaaju & Olokoyo, 2018; Okoye & Eze, 2023). The inability to fund loans and advances that had been given to customers and creditors including companies related to directors and managers was the greatest source of distress among liquidated banks in Nigeria. The disbursement of loans by the management and board of directors of these banks were not based on the principles of lending rather on the interpersonal relations with families, friends, relatives and so on. The reality of such cases was evidenced where the Central Bank of Nigeria (CBN) ordered the replacement of Directors and Management of Skye Banks Plc due to liquidity concerns notwithstanding Audits by Big Audit firms Magaji et al. (2020).

Given the generality of banking operations, understanding the causality connection between these two tenets has become increasingly important. Determining, whether improvement in credit risk management lead to better financial performance or whether financially strong banks are more capable of implementing robust risk management frameworks can provide valuable insight for bank management. More so, empirical evidence from different economies are laced with mixed findings: while some studies establish a unidirectional causality from credit risk management to financial performance Kajola et al. (2018), Kyabarongo et al. (2024) other report a bidirectional causality, Mudanya et al. (2022)

suggesting that that both variables influences each other. This inconsistency underscores the need for further investigation in Nigeria where banking system are faced with structural challenges such as a weak credit appraisal process and poor regulatory compliance.

Following the introductory section of this paper, Section 2 discusses the literature review. The study's methodology is provided in Section 3, Section 4 presents the data and interpretation, whereas Section 5 presents the conclusion.

2.0 Literature Review

2.1 Conceptual Review

Bagale et al., (2023) and Gupta et al., (2020), Sanarya et al. (2023) define credit risk as the potential that a debtor or counterparty will default in satisfying a contractually predetermined obligation according to the agreed-upon terms. Basel Committee on Banking Supervision (2019) sees credit risk as the likelihood that counterparty (a bank borrower) will fail to meet its obligations in accordance with agreed terms. Omorokunwa et al. (2020), also sees credit risk as “the risk of loss arising from default by a creditor or counterparty. This study therefore, viewed credit risk as the loss banks incurred due to the failure of the borrowers to pay back the money borrowed and which have a future threat to the financial strength of the banks.

Financial performance on the other hand has been viewed by different scholars, for example, Rokhimah (2024) and Nisak (2023) refers to financial performance as the assessment of an organization's or entity's financial performance over a specific time period, whether a corporation, financial institution, or individual. Administration. Furthermore, Soyemi (2019) opined that financial performance encompasses a variety of metrics and indicators that give a broad

picture of an organization's operational effectiveness, financial sustainability, and overall financial health. In this paper, financial performance is defined as the overall financial status of a firm showing how well and frequent it generate revenue manages its asset and liabilities in achieving its financial goals.

2.2 Theoretical Review

On the basis of theory, this study is premised on the commercial loan theory. The choice of this theory was based on its focus on providing business organizations with short-term, self-liquidating, productive loans as a means of enhancing the banking sector's sustainability and financial stability. The commercial loan theory establishes a connection between the deposit money banks' financial performance (dependent variables) and their credit risk management procedures (independent variables). This is because, by the time banks focuses on short-term self-liquidating productive loans like one month, two months, three months and maximum six months, loan defaults and non-performing loans will be checked thereby reducing non-performing loans and loan loss provisions, this will help in improving the financial stability of banks.

2.3 Empirical Review

For the empirical literatures, evidence points to a causal connection between the variables of interest, though the direction and strength of causality vary by study and methodology adopted.

Harcourt (2017) investigated the effect of credit risk management on the performance of Nigerian deposit money banks using annual time-series data from 1989 to 2014. The study employed a parsimonious Error Correction Model (ECM) and Granger causality tests to examine the relationship between credit risk indicators and bank performance. The findings showed that non-

performing loans significantly reduced profitability, while prudent lending positively influenced bank performance. The study concluded that effective credit risk management is essential for improving banks' financial performance and recommended stronger credit appraisal, continuous loan monitoring, efficient loan recovery mechanisms, and stricter regulatory oversight to minimize credit risk and enhance banking sector stability.

Olaoye and Fajuyagbe (2020) investigated the effect of credit risk management on the profitability of selected Nigerian deposit money banks using panel data from 2008 to 2017. Employing panel regression analysis, the study found that non-performing loans negatively affected bank profitability, while adequate loan-loss provisions improved financial performance. The study concluded that effective credit risk management enhances bank profitability and recommended stronger credit appraisal, continuous loan monitoring, and adequate provisioning against credit losses.

Ohonba and Aigienohuwa (2024) examined the effect of credit management on the financial performance of Nigerian deposit money banks using data from 2012 to 2022 and Ordinary Least Squares (OLS) regression. The study found that non-performing loans had a significant negative effect on bank profitability, while the capital adequacy ratio had no significant effect. It concluded that effective credit management improves financial performance and recommended stronger credit appraisal, loan monitoring, and recovery mechanisms to reduce non-performing loans and enhance bank profitability.

Adegbe and Otitolaiye (2020) examined the effect of credit risk on the financial performance of Nigerian deposit money banks using panel data from 2006 to 2018. The study employed regression analysis and found that effective credit risk management

significantly improves bank performance. It concluded that banks should strengthen credit monitoring systems, reduce non-performing loans, and adopt prudent lending practices to enhance profitability and financial stability.

Kolapo et al. (2022) investigated the effect of credit risk on the performance of Nigerian commercial banks using panel data from 2000 to 2021. The study employed panel regression analysis and found that credit risk indicators, particularly non-performing loans and loan loss provisions, negatively affect bank profitability. The study concluded that effective credit risk management through prudent lending, proper loan monitoring, and improved credit evaluation is necessary to enhance bank performance and financial stability.

Natufe and Evbayiro-Osagie (2023) examined the effect of credit risk management on the financial performance of Nigerian deposit money banks using panel data from 2010 to 2021. The study employed panel regression analysis and found that credit risk indicators, particularly non-performing loans, significantly influence bank profitability. The study concluded that effective credit risk management enhances bank performance and recommended improved credit monitoring, stronger risk assessment practices, and regulatory measures to reduce loan defaults and promote banking sector stability.

Akinleye et al. (2020) examined the effect of credit risk management on the financial performance of selected Nigerian deposit money banks using panel regression analysis. The study found that credit risk management variables influence bank profitability, with lending activities having a positive but insignificant effect on performance. It concluded that banks should strengthen credit assessment, monitoring systems, and prudent lending practices to minimize credit losses and improve financial performance.

Olaoye and Fajuyagbe (2020) examined the effect of credit risk management on the profitability of selected Nigerian deposit money banks using panel data from 2008 to 2017. The study employed panel regression analysis and found that non-performing loans negatively affected bank profitability, while adequate loan-loss provisions improved financial performance. The study concluded that effective credit risk management is essential for enhancing bank profitability and recommended stronger credit appraisal, loan monitoring, and recovery strategies to minimize credit losses.

Synthetically, While Harcourt (2017), Olaoye and Fajuyagbe (2020), Ohonba, and Aigienohuwa (2024), , provided the most explicit evidence of causality through Granger tests, establishing that credit risk management granger cause changes in bank performance. Other studies like (Adegbe and Otitolaiye, 2020, Kolapo et.al. 2022, Natufe, & Evbayiro-Osagie, 2023) showed significant associations suggestive of causality relationship, though without formal causality testing. Some of the studies recorded a mixed result, such as those of Akinleye et al. (2020), Olaoye and Fajuyagbe (2020), Natufe and Evbayiro-Osagie (2023), indicate that the relationship may depend on contextual factors like bank size, macroeconomic environment, and regulatory frameworks.

The literature makes it evidently that strong capital adequacy and reduced non-performing loans, which are indicators of effective credit risk management, have a minor impact on the sustainability and financial performance of deposit money banks.

3.0 Methodology

3.1 Data source and measurement of variables

Data were source from annual financial reports, income statements of deposit money banks in Nigeria as well as institutional sources like the CBN statistical bulletins, and the NDIC reports from 2015 to 2024. These were readily available from the Banks, CBN and NDIC website as published. Specifically, purposeful sampling techniques was used with 10 sample size was selected among the deposit money bank on the floor of the Nigeria Exchange Group listed. These consist of Union Bank of Nigeria Plc, United Bank of Africa (UBA) Plc, Zenith Bank Plc, Access Bank Plc, First Bank Plc, First City Monument Bank Plc, Fidelity Bank Plc, Guaranty Trust Bank Plc, and Sterling Bank Plc. These banks were selected to represent the targeted population of the study among the fifteen (15) listed Deposit Money Banks in Nigeria due to the availability of information required in study between 2015 to 2024 validity of a period of ten years. This period was chosen due to the availability of data on Nigeria Exchange Group as at the period of this study and have their annual audited accounts published, as a requirement for all listed companies.

3.2 Estimation Techniques

Trends and sterilized fact alongside the descriptive statistics were used to gain

appropriate insight into the analysis. The Panel Unit-Root Tests conducted for this study are the Levin-Lin-Chu (LLC) Common unit root and the Im, Pesaran and Shin individual (IPS) unit-root tests. These tests are considered appropriate to test the data stability conditions of the series. The former test is on the basis that all the variables have common data scope and it is usually based on the variable with the least data points. The latter test addresses the peculiarity of each individual variable. More so, there are two (2) stages that the two (2) unit-root tests have been evaluated. After ascertaining the result of the panel unit root test, panel Kao cointegration test was examined to ascertain the long run situation of the variables employed in the model. The next step is to determine the panel causality test, this was carried out using the Dumitrescu–Hurlin (2012) Panel Granger Causality Test which is the main estimation techniques of the model. One significant advantage of this test is that it allows heterogeneous panel data such as the Nigeria deposit money banks, it also allow each cross section (bank) to have its own coefficients and lag structure while testing for an overall causality relationship across the panel. It accommodate panels with small time dimensions and large numbers of cross-sections, and can detect both unidirectional and bidirectional causality.

3.3 Model Specification

The model is specified as thus:

$$\Delta ROA_t = \delta_x + \sum_{i=1}^{k+d} \beta_x \Delta ROA_{t-i} + \sum_{j=0}^{k+d} \beta_x \Delta DMBS_{t-i} + \mu_t \quad (1)$$

$$\Delta DMBS_t = \delta_y + \sum_{i=1}^{k+d} \beta_y \Delta DMBS_{t-i} + \sum_{j=0}^{k+d} \beta_y \Delta ROA_{t-i} + \mu_t \quad (2)$$

$$\Delta ROE_t = \delta_x + \sum_{i=1}^{k+d} \beta_x \Delta ROE_{t-i} + \sum_{j=0}^{k+d} \beta_x \Delta DMBS_{t-i} + \mu_t \quad (3)$$

$$\Delta DMBS_t = \delta_y + \sum_{i=1}^{k+d} \beta_y \Delta DMBS_{t-i} + \sum_{j=0}^{k+d} \beta_y \Delta ROE_{t-i} + \mu_t \quad (4)$$

In equation 1 through 4, DMBS_t and ROA_t is deposit money banks and return on asset represent employment and entrepreneurship development respectively; Δ is the first-difference operator; δ_x and δ_y are the intercepts; *k* is the optimal lag length; *d* is the

maximum order of integration; β_x and β_y are the coefficients of DMBS_t and ROA_t respectively. Equation (3) indicates that ROE_t is Granger caused by its past values and DMBS_t, equation (4) indicates a similar behavior for DMBS_t.

Table 1: Variable Measurement and Justification

Variable Category	Variable Name	Measurement / Proxy Indicators	Data Source
Independent variable	Capital Adequacy Ratio (CAR)	CAR, Total Asset/ Risk Weighted Asset	CBN statistical bulletins, 2024
Independent variable	Liquidity Ratio (LR)	LR, Total Loans /Total Deposit	Annual financial Reports, income statements
Independent variable	Loans to Deposit Ratio (LDR)	LDR, Total Loans and Advances/Total Deposit	Annual financial Reports, income statements
Independent variable	Loan loss Provisions Ratio (LLPR)	LLPR, Loan Loss Provision/total Loans	Annual financial Reports, income statements
Independent variable	Non-Performing Loan Ratio (NPLR)	NPLR, Non-performing Loans/ Total Loan and Advances.	Annual financial Reports, income statements
Control variable	Cash Reserve Ratio (CRR)	CRR, Reserve Requirement with CBN /Total Deposit of Customers	CBN Statistical bulletins, 2024
Control variable	Coverage Ratio (CR)	CR, Interest income on Loan / Average Gross Loan	CBN Statistical bulletins, 2024
Control variable	Leverage Ratio (LER)	Total Debt/Total Asset	CBN Statistical bulletins, 2024

Dependent variable	Return on Equity (ROE)	Profit after Tax/ Total Equity	Annual Reports, statements	financial income
Dependent variable	Return on Assets	Profit after tax/ total Asset	Annual Reports, statements	Financial income

Sources: Authors' Computation

4.0 Results and Discussion

4.1 Trend analyses

In order to avoid clumsy trend analyses, the trends for deposit money banks and credit risk management of Zenith Bank International has been separated from other due to its outlier effects. Putting it together with others tend to dwarf the others and make the trend ineligible for discussion. This suggest that Zenith Bank International appears to have huge financial balance sheet worth ahead of other banks in Nigeria; which are relatively in similar class of balance sheet. It is for this reason that the trends for all the

other representative banks could be provided using the same set of figures. In Figure 1, the trends of credit risk variables of capital adequacy ratio (indicated as car), loan to deposit ratio (indicated as ldr), loan provision ratio (indicated as lpr), non-performing loans ratio (indicated as nplr), cash reserve ratio (indicated as csr), coverage ratio (indicated as covr), leverage ratio (indicated as lvr) and liquidity ratio (indicated as liqr) are illustrated. As depicted in Figure 1, the highest return on asset is 3.0 percent and for Access Bank Plc. in 2023, while the least is 0.53 percent for FCMB in 2015. The highest return on equity is 41.7 percent for Fidelity Bank in 2024 while the least is 5.75 percent for First Bank Plc in 2015.

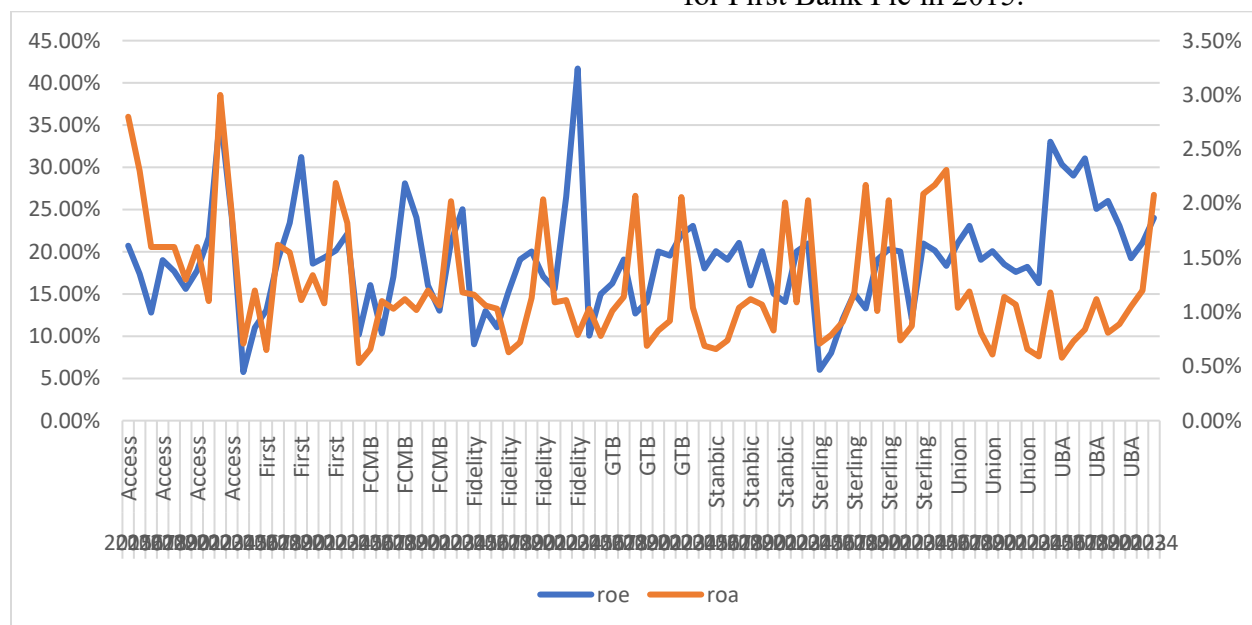


Figure 1: DMBS (2015 – 2024)

Source: Authors Computation

Although, the trends for these two variables for Zenith Bank International Plc appears to be way higher than those of the other banks. However, both measures still follow the same

patterns observed for those of the other banks. As observed, the return on assets is highest to the tune of 398.3 percent in 2022 but lowest in 2023 to 205.05 percent. The corresponding highest value for return on equity is highest in 2022 to 1,971 percent but lowest in 2017 to 303.0 percent in 201. These indicate that these banks have been able to increase the wealth of the shareholders, being the residual owners of the banks, more than they have done to maximize profits. Ultimately, these would reduce the usual agency costs; attributed to the conflicts between profits and wealth maximization objectives of firms.

4.2 Panel Unit Root Test

The results for the LLC (common) unit-root test detailed in Table 1 show that the null

hypothesis that each variable is unit-root is rejected at the 1 percent level of significance. The only exemption here is the cash reserve ratio (indicated as *csr*) which still remains unit-root after the first order of integration. On the other hand, the results for the IPS unit-root test with the null hypothesis that the series is unit-root could not reject the null hypothesis for all the individual variables at levels. Specifically, three variables are remain unit-root or not stationary in their level forms. These are ROA, the ROE and the loan provision ratio (indicated as *lpr*). Nonetheless, the null hypothesis even at the 10 percent level can't be rejected for the cash reserve ratio remains (indicated as *csr*) even when integrated of order 1.

Table 1: Panel Unit-Root Tests

S/N	Variables	Levin, Lin and Chu (LLC)			Im, Pesaran and Shin (IPS)		
		<i>I</i> (0)	<i>I</i> (1)	<i>H</i> ₀ : <i>r</i>	<i>I</i> (1)	<i>I</i> (1)	<i>H</i> ₀ : <i>r</i>
1.	<i>roa</i>	2.928***	-	Reject	0.368	1.718**	Reject
2.	<i>roe</i>	1.777**	-	Reject	0.349	1.548*	Reject
3.	<i>car</i>	4.209***	-	Reject	1.810**	-	Reject
4.	<i>cov r</i>	4.867***	-	Reject	2.088**	-	Reject
5.	<i>csr</i>	21.392	14.924	Do not Reject	11.344	9.242	Do not Reject
6.	<i>ldr</i>	4.989***	-	Reject	1.870**	-	Reject
7.	<i>liqr</i>	2.255**	-	Reject	2.081**	-	Reject
8.	<i>lpr</i>	3.577***	-	Reject	0.883	4.567**	Reject
9.	<i>lvr</i>	5.945***	-	Reject	2.271**	-	Reject
10.	<i>nplr</i>	9.513***	-	Reject	3.527***	-	Reject

Source: Author's Computations.

As the results for stationarity of the variables have confirmed a large number of the variables included for empirical investigation for this research work to be stationary at levels.

4.3 Panel Cointegration Test

The next objective of the study is to find if there exist a short-run or long-run relationship among the variables included in the models. The Panel Kao Residual Cointegration Test has been estimated to ascertain these relationships. The results, as detailed in Table 2, show that the null

hypothesis that no cointegration has been rejected at the 1 percent of significance for both models of return on assets and return on equity (see Table 2). The implication is that all the variables included in the models have long-run equilibrium conditions with the respective dependent variables. Heuristically, this indicates that credit risk factors of the deposit money banks in Nigeria have equilibrium condition to move together into the long-run situations with the financial performance of these banks.

Table 2: Panel Cointegration Tests

Panel 5a: Panel Kao Residual Cointegration Test			
Model 1: ROA <i>Ho : No _ Co integration</i>		Model 2: ROE <i>Ho : No _ Co integration</i>	
<i>t – stat.</i>	<i>Ho : r</i>	<i>t – stat.</i>	<i>Ho : r</i>
-3.090***	Reject	-4.700***	Reject
Panel 5b: Panel Pedroni Cointegration Test			
Model 1: ROA <i>Ho : No _ Co integration</i>		Model 2: ROE <i>Ho : No _ Co integration</i>	
ADF <i>t – stat.</i>	<i>Ho : r</i>	ADF <i>t – stat.</i>	<i>Ho : r</i>
-4.684***	Reject	-2.232**	Reject

Source: Author's Computations. Note: ***, **, * denotes significance at the 1%, 5% and 10% levels respectively.

After establishing cointegration, it is imperative to ascertain which of these variables granger causes one another. This is considered for the ROA and ROE measures of financial performance respectively. The null hypothesis for the pair-wise granger causality test in both models remain same and it is that the independent variable, in each case, does not granger causes the dependent variable. The results are evident that this null hypothesis is rejected for the case of loan provision ratio and return on asset. This implies that loan provision ratio truly granger causes return on assets of the deposit money banks in Nigeria. Also, the null hypothesis that the cash reserve ratio does not granger causes return on assets is rejected at the 1 percent level of significance and vice versa.

This indicates that there is a bi-causal relationship between the cash reserve ratio and the return on assets of the deposit money banks in Nigeria. However, it is even the return on assets that granger causes the coverage ratio and liquidity ratio respectively as the null hypothesis is rejected at the 1 percent level in each instance.

But, the reverse causation is rejected as it is evident that the null hypothesis that coverage ratio does not granger cause the return on asset, on the one hand, and that the liquidity ratio does not granger cause return on asset cannot be rejected in each case; even at the 10 percent level of significance. For all the other pair-wise granger causality relationships between each of the independent and dependent variables, and those of the reverse causality, the null

hypothesis that the former does not granger cause the latter, and vice versa, cannot be

rejected even at the 10 percent level of significance.

Table 2: Panel Granger Causality Test

S/N	Model 1: ROA $H_0: x \not\subset y$			Model 2: ROE $H_0: x \not\subset y$		
	Granger Causes	$z - stat.$	$H_0: r$	Granger Causes	$z - stat.$	$H_0: r$
1.	$car \subset roa$ $roa \subset car$	-0.464 -0.877	Do not Reject Do not Reject	$car \subset roe$ $roe \subset car$	0.926 0.230	Do not Reject Do not Reject
2.	$ldr \subset roa$ $roa \subset ldr$	0.760 0.737	Do not Reject Do not Reject	$ldr \subset roe$ $roe \subset ldr$	0.389 2.351**	Do not Reject Reject
3.	$lpr \subset roa$ $roa \subset lpr$	2.992*** 0.820	Reject Do not Reject	$lpr \subset roe$ $roe \subset lpr$	3.884*** 1.238	Reject Do not Reject
4.	$nplr \subset roa$ $roa \subset nplr$	1.235 0.913	Do not Reject Do not Reject	$nplr \subset roe$ $roe \subset nplr$	2.021** 0.797	Reject Do not Reject
5.	$csr \subset roa$ $roa \subset csr$	6.010*** 9.221***	Reject Reject	$csr \subset roe$ $roe \subset csr$	3.925*** 2.825***	Reject Reject
6.	$covr \subset roa$ $roa \subset covr$	0.116 4.330***	Do not Reject Reject	$covr \subset roe$ $roe \subset covr$	1.262 7.664***	Do not Reject Reject
7.	$lvr \subset roa$ $roa \subset lvr$	1.481 -0.856	Do not Reject Do not Reject	$lvr \subset roe$ $roe \subset lvr$	1.184 1.816	Do not Reject Do not Reject
8.	$liqr \subset roa$ $roa \subset liqr$	1.436 4.823***	Do not Reject Reject	$liqr \subset roe$ $roe \subset liqr$	-0.326 0.606	Do not Reject Do not Reject

Source: Author's Computations.

Nonetheless, for the second model, with the return on equity as the dependent variable, largely confirms the results obtained for the first model but with few changes. The first is that the hypothesis that the ratio of non-performing loans does not granger cause the ROE was rejected at the 5 percent level with 2.021 T-statistics value. But, the hypothesis for the reverse causality cannot be rejected at the 10 percent level of significance. This implies that only a uni-directional causality exist between the ratio of non-performing loans to the ROE and that it only moves from the former to the latter and not vice versa. In addition, the null hypothesis that return to equity does not granger causes the loan to deposit ratio is also rejected at the 5 percent level with 2.351 T-statistics value. This implies that the direction of causality actually moves from ROE to the loan to deposit ratio.

However, the null hypothesis for the reverse causality cannot be rejected; indicating that the latter is not likely to impact on the former for the deposit money banks in Nigeria. Instructively, all these rejections or otherwise of the null hypothesis and the corresponding directions of causality have implications for impact analysis of how the credit risk management factors significantly impact on the financial performance of these banks in Nigeria.

Discussion of Findings

The panel granger causality analysis presume a significant insight into the dynamic interaction between Nigerian deposit money banks' financial performance and credit risk management, given that all the variables were conformed to be stationary at levels. The analysis validly captures short run causality patterns among the variables. Two

model were estimated, with return on asset (ROA) and return on equity (ROE) serving as the measures for financial performance of deposit money banks in Nigeria. In the model 1 which is on return on assets (ROA), the result indicate the presence of both unidirectional and bidirectional causality between the variables of the credit risk management and bank profitability. Interestingly, the loan provision ratio (LPR) was found to granger cause ROA at the one percent significant level, suggesting that changes in loan loss provisions significantly predict future movement in profitability. This findings reinforces the argument that effective provisioning for loan losses enhances bank assets and profitability by mitigating potential credit default. This result is consistent with the findings of Harcourt (2017) and Natufe and Evbayiro-Osagie (2023), who reported that prudent credit risk management significantly improves the performance of Nigeria banks. Similarly, Adegbaie and Otitolaiye (2020) observed that an increase in loan loss provisions has a forward looking impact on banks profitability, as it reflect proactive risk anticipation and improved credit evaluation.

Furthermore, a bi-directional causality was found between the cash reserve ratio (CSR) and ROA, indicating mutual feedback between liquidity management and profitability. This result suggest that while reserve requirement influence the liquidity and earning ability of the banks, profitability also determines how much liquidity banks can prudently maintain. The bidirectional causality aligns with Bencharles and Nwankwo (2021), who found that liquidity reserves booth affect and respond to profitability in Nigeria banks due to regulatory adjustment and internal management policies. In contrast, the ROA was found to granger cause both the coverage ratio and liquidity ratio, while the reverse causality was not supported. This implies that

improvement in profitability drive changes in liquidity and coverage management, but variations in those ratios do not precede performance shift. The unidirectional causality from profitability to liquidity ratio corroborate the findings of Olaoye and Fajuyagbe (2020), who argued that banks trend to strengthen their liquidity buffers and risk coverage policies only after achieving profit growth. For the credit risk management indicators such as the loan to deposit ratio (ldr), non-performing loan ratio (nplr) and capital adequacy ratio (car), the null hypothesis of no causality cannot be rejected even at 10 percent significant level. This suggest that these variables do not exhibit short run predictive influence on profitability, although their effect may manifest in the long run. This finding is in line with the study conducted by Ughulu, Edogiawerie and Musa (2023) who discovered weak short run causality between capital adequacy and profitability in Nigeria DMBS, arguing that such relationship are typically long run driven due to regulatory capital cycles and gradual credit adjustment. In model 2, which uses the ROE as the dependent variable, largely confirms the pattern observed under the ROA specification but suggest noble difference. The non-performing loan ratio (NPLA) was found to granger cause ROE at the five percent level of significant, suggesting that the variations in the quality of loan portfolios significantly granger cause shareholders returns. However, the revers causality was not significant, indicating unidirectional causality from NPLR to ROA. This findings aligns with Obanna and Aigienohuwa (2024), who reported that rising non-preforming loans adversely affect equity returns due to increased impairment cost. It also aligns the Makwe et al. (2024), who documented that proper credit risk management leads to a reduction in shareholders profitability among Nigeria deposit money banks in Nigeria.

Again the test reveals a unidirectional causality from ROE to loan to deposit ratio at the five percent significant level, implying that higher profitability motivates banks to expand their loan portfolio relatives to deposits. However, the revers causality was insignificant, indicating that variations in loan to deposit ratios do not necessarily predict profitability movement. This findings is consistent with Ifeanyi and Ijeoma (2022), who found that profitable banks are more likely to increase credit, reflecting a risk-taking tendency fueled by strong earnings performance.

Furthermore, similar to the result of the ROA model, a bi-causal relationship between cash reserve ration and ROE was confirmed at the one percent significant level, reiterating the combine impact between liquidity management and profitability. This is in line with the Akinlo and iredele (2024) and Bencharles and Nwnakwo (2021), who both found that liquidity measures exert simultaneous influence on one another in Nigeria banks. In all, these findings support the risk-return hypothesis, which assert that efficient credit management influences deposit bank performance by reducing defaults risk and improving asset utilization Kargi, 2011, Kolapo et.al. 2012.

5. Conclusion and Recommendation

Using the panel Granger causality test, this study investigated the causal connection between credit risk management and the financial deposit performance of deposit money banks in Nigeria. Result emanating from the study revealed that factors related to credit risk management have a major impact on Nigerian deposit money banks' performance, while others exhibit reverse effect. Indicating that a dynamic interdependence exist between the variables. Interestingly, the loan provision ratio (LPR) was found to granger cause both the ROA and the ROE, suggesting that prudent loan provisioning influences performance of

deposit money bank and long term stability, again, the study found a bi-directional causality between the cash reserve ratio (CSR) and performance of deposit money banks in Nigeria, implying that liquidity management and profitability reinforces each other, while optimal liquidity support efficient operations, higher performance of the deposit money banks equally enhances banks to maintain stringer reserves. The result further reveal that ROA granger causes both the coverage ratio (COVR) and the liquidity ratio, suggesting that deposit money banks tend to strengthen their liquidity and coverage position. Even though the revers causality was not statistically significant. The non-performing loan ratio was also found to granger cause ROE, suggesting that asset quality plays a significant role in determining shareholders return. The study concluded that that loan provision ratio truly granger causes return on assets of the deposit money banks in Nigeria. On the basis of this findings, this study recommends that deposit money banks should strengthening their loan loss provisioning practices, maintain optimal liquidity and reserve balances and integrate profitability metrics into their credit risk management framework , doing this abate excessive risk taking.

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