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Effect of Bank-Specific Attributes on Non-Performing Loans in Deposit Money Banks in Nigeria

***Wuyep, Tony Lohven (PhD); & **Eze, Felicia (PhD)**
*Department of Business Administration, Bingham University, Karu.
**Department of Entrepreneurship Studies, Bingham University, Karu.

Abstract

Financial stability in the banking sector of every economy largely depends on the quality of the risk assets and bank attributes have also been identified by scholars as one of the significant determinants of the quality of bank credit. This study examined the effect of bank-specific attributes on non-performing loans (NPLs) in deposit money banks in Nigeria. Study proxies include, ownership concentration, operational efficiency, capital adequacy, return on asset and loan-to-asset ratio for the period 2011-2022. Ex-post-facto research design was employed and population comprised of all the listed deposit money banks on the floor of the Nigerian Stock Exchange group. Data was sourced from annual audited accounts and financial reports of the listed deposit money banks. Descriptive statistics, correlation matrix and panel regression techniques were the main statistical tools used in the analysis of data. Findings showed that ownership concentration and capital adequacy have negative and insignificant effect on non-performing loans while operational efficiency has a positive and insignificant effect on non-performing loans. Similarly, loan-to-asset ratio has a positive and significant effect while return on asset has a positive and significant effect on non-performing loans. Based on these findings, the study concludes that the loan portfolio quality of listed deposit money banks in Nigeria is determined by bank-specific attributes such as capital adequacy, operational efficiency, and loan-to-asset ratio. The study thus recommends that banks should intensify their lending efforts with greater efficiency to curb the rising position of bad credit in the banking sector. Furthermore, banks should adhere strictly to regulatory guidelines

on debt ratio measures using well-trained and competent personnel to limit the deteriorating position of non-performing loans in the banking sector.

Keywords: Bank specific attributes, ownership concentration, operational efficiency, capital adequacy, return on asset, loan to asset ratio, non-performing loan.

Introduction

Over the years, the study on the deterioration in the quality of bank assets has continued to take center stage in banking research and policy discuss. Similarly, the intermediation function of banks naturally exposes them to credit risk which is by far the most significant impediment to their success (Ogbulu & Eze, 2016). Apart from its substantial income generation potential, the lending procedure is quite cumbersome and bedeviled with high risk. It is also pertinent to note that the setting aside of funds to cover potential losses expected from advancing credits can translate to financial disintermediation, hence limiting financial deepening which in turn hinders economic growth (Sunday, et. al., 2020).

Measures to curb the growth of bad loans are usually stipulated in policies that express the banks' credit risk management philosophy and the parameters within which credit risk is controlled. However, bank-specific factors like operational efficiency ratio, Bank size, capital adequacy, loan-to-deposit ratio, profitability ratio, ownership concentration, liquidity ratio, asset quality and risk management constitute the group of microeconomic variables that show the effect of commercial banks' operational characteristics, management capacity, and features on credit risk in business firms. Non-performing loans are regarded as loans that exceed ninety days hence are past their due or not generating interest any longer (Demirgunes, 2016). They further explained that if the loan's interest and principal payment is unsettled by ninety days, it may be regarded as nonperforming loan. Furthermore, NPLs are used as a pointer for financial steadiness and particularly banking system stability (Ngungu & Abdul 2020). Hammami and Ouhibi (2015) observed that NPLs can diminish asset quality and also cripple efficiency and effectiveness in the allotment of resources to prolific sectors.

Bank-specific factors like Return on Asset (ROA) is an important indicator of the performance of banks since it determines the profitability of the bank based on its asset quality. Other variables like capital adequacy ratio and loan-to-deposit ratio measure the stability of banks' financial position and liquidity status by comparing its total loans to its

total deposit respectively. As a matter of fact, efficiency in the management and implementation of sophisticated lending policy facilitates the rise in return and also lowers the probability of loans being in non-performing category. Inefficient banks fail to screen and monitor borrowers effectively; hence banks with high operating income ratio face higher levels of non-performing loans (Alexandria & Santoso, 2015).

Despite the intense regulation of banks by the monetary authorities along-side the persistent training of bank personnel, the issue of bad loans remains a big threat toward the survival of Nigerian deposit money banks. Similarly, empirical studies have shown that interest income constitutes over 75% of banks' revenue generating capacity (Kargi, 2011; Kingu, et.al. (2018). Other studies have revealed that the main reason for bank failure is increasing bad loans caused by harsh economic situation coupled with incompetent loan administration and deficient loan conditions, among others (Khanifah, et.al., 2018).

Furthermore, there has been a persistent increase in the level of non-performing loans in the Nigerian banking sector, most especially, after the recapitalization and consolidation exercise of 2005 and the global financial crises of 2007/2009. This development, along with the great lessons gained from previous studies and the several measures adopted to address the problem of non-performing loans and the measures so far taken have not yielded the desired result. The sharp increase in the level of NPLs by 220% from N0.65 trillion as at 31/12/2015 to N2.08 trillion as at 31/12/16 compared unfavorably with the maximum prudential threshold of 5%. However, the 2016/2017 economic recession caused NPLs to increase significantly from 12.8% in 2016 to 14.8% in 2017 respectively (NDIC Annual Report & Accounts, 2017). This was due to the heavy oil dependence nature and exposure of the economy.

In view of the foregoing, this study becomes an extension of the limited research conducted to generate more and further information based on empirical evidence of deposit money banks. This will also fill the literature gap by analyzing the relationship between the bank-specific attributes and non-performing loans of deposit money banks in Nigeria.

As the theoretical debate on the actual determinants of non-performing loans continues, more empirical studies are required to establish the actual causes of bad loans and the strength of such relationships. It is also crystal clear that findings relating to the determinants of NPLs in Nigeria are inconclusive. This is more so that most researchers in my view look at NPLs from macroeconomic perspective.

The main objective of the study is to examine the effect of bank-specific attributes on non-performing loans of deposit money banks in Nigeria. The specific objectives are to:

i. assess the effect of ownership concentration on non-performing loans of deposit money banks in Nigeria;
ii. evaluate the effect of operational efficiency on non-performing loans of deposit money banks in Nigeria;
iii. examine the effect of capital adequacy on non-performing loans of deposit money banks in Nigeria;
iv. determine the effect of Return on Asset (ROA) on non-performing loans of deposit money banks in Nigeria; and
v. investigate the effect of Loan-to-Asset Ratio (LAR) on non-performing loans of deposit money banks in Nigeria.

To this end, the following hypotheses were tested:

H_{01}: Ownership concentration has no significant effect on non-performing loans of deposit money banks in Nigeria.

H_{02}: Operational efficiency has no significant effect on non-performing loans of deposit money banks in Nigeria.

H_{03}: Capital adequacy ratio has no significant effect on non-performing loans of deposit money banks in Nigeria.

H_{04}: Return on asset (ROA) has no significant effect on non-performing loans of deposit money banks in Nigeria.

H_{05}: Loan-to-Asset Ratio (LAR) has no significant effect on non-performing loans of deposit money banks in Nigeria

Conceptual Framework

This section conceptualizes the independent and dependent variables and their proxies.

Concept of Bank-Specific Attributes

The bank specific factors are internal bank factors that are peculiar to the bank and within the control of the management of banks. Bank-specific attributes also constitute factors within the direct control of managers that can best be explained by "CAMEL", which is an international rating system used by regulatory banking authorities to rate financial institutions. The CAMEL acronym stands for "Capital adequacy, Asset quality, Management, Earnings and Liquidity. Conversely, industry-specific macroeconomic variables such as inflation, gross domestic product (GDP), national income, and unemployment are outside our scope. However, this study focuses on the following bank-specific variables: Ownership concentration, operational inefficiency, capital adequacy, return on asset and loan-to-asset ratio.

Non-Performing Loans

The concept of non-performing loans has been expressed by different scholars in literature; hence, no common definition of non-performing loan exists. Consequently, this study documents divergences in the definition of NPLs across countries. A loan may be considered non-performing in one country while it might not be viewed as such in another. However, consensuses on bad loans in some countries seem to match. Since the definition of NPLs differs across nations, the analysis of their impact across countries and regions requires careful interpretation. The International Monetary Fund (IMF) compilation guide on financial soundness indicators (2015) defined non-performing loans as any credit facility in which interest and/or principal payments are past due by 90 days or interest payments equal to 90 days or more have been capitalized, refinanced or delayed by agreement or payments that are less than 90 days overdue, but there are good reasons, such as a debtor filing for bankruptcy, to doubt that payments will be made in full.

The Central Bank of Nigeria (2015) defined non-performing loan and advances as a loan facility whose credit quality has depreciated and full collection of principals and/or interest as per the contractual repayment terms of the loan and advances are uncertain. A loan is also regarded as non-performing when the principal or interest is due and unpaid for six months or more from the first day of default (Prudential Guidelines, 2014). Non-performing loans refer to loans which for a relatively long period of time do not generate income. Controlling non-performing is very important for both the performance of an individual bank and the economy's financial environment (Fred, 2015).

It is crystal clear that most of the definitions do not specify the loan grouping as substandard, doubtful, or lost. Generally, Non-performing loans can be regarded as the deteriorating assets of deposit banks which adversely affect their efficiency in terms of liquidity and profitability. Problematic loan is a clear indication that the orderly repayment of the debt as contained in the loan agreement is in jeopardy.

Ownership Concentration

The concept of ownership structure can be described along two dimensions, namely-ownership concentration and ownership mix. Ownership concentration is the number of shares owned by individuals who own 5% and above divide by the total shares of the bank. It can also be described as the proportion of firms' shares owned by a given number the largest shareholders (Sanda, et al., 2005). While ownership concentration refers to the share of the largest owner, ownership mix relates to the identity of the major shareholder such as ownership concentration, foreign ownership, domestic ownership and the like, (Anstoniadis, 2010; Wen, 2013;).

Operational Efficiency

Operational efficiency (OPE) can be defined as a measurement of resource allocation between an output gained from the business and an input to run a business operation. It is a metric that measures the efficiency of profit earned as a function of operating cost. This is because the entity is able to generate greater income or returns for the same or lower cost or alternative. Generally, operational efficiency can also be viewed as the ratio of operating expense to operating income during a specified period. High value of this ratio indicates poor management efficiency. Efficiency is viewed from both cost and profitability context.

Capital Adequacy Ratio

Capital adequacy describes the internal strength of a firm (bank) to withstand losses during crisis. It can also be viewed as the ratio of a bank's capital in relation to its risk-weighted assets and current liabilities. Capital adequacy ratio measures the solvency level of a firm and can also be regarded as the amount of owner's equity fund available to support the business and can act as a defense or buffer during adverse situation (Athanasogwu, et al. 2005). It is measured by total equity to total assets. A bank with a high capital adequacy ratio is considered safe and likely to meet its financial obligations. Conversely, banks with low capital usually experience high probability of failure due to large volume of bad loans.

Return on Asset (ROA)

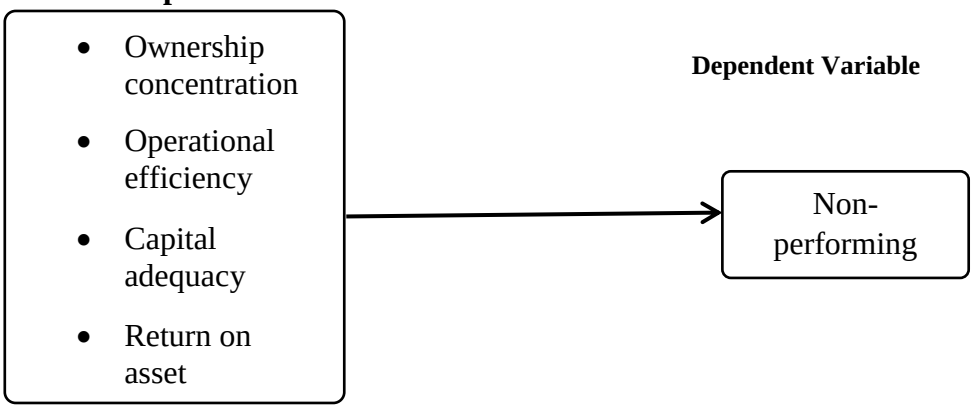
Return on Asset (ROA) is an important financial performance ratio because it measures the efficiency with which the firm is managing its investment in assets and using them to generate profit (Obalemo et al., 2020). Return on assets is a ratio that describes the capability of a company to benefit from its assets (Primatua, 2017). Increasing the ROA value, of course, will increase the benefits you get. This is because the level of return on investment is getting bigger, therefore ROA is also used to describe how far the company's ability to make profitability from available assets.

Loan-to-Asset-Ratio (LAR)

Loan-to- total asset ratio is the relationship between total loans amount and total assets. It indicates the proportion of bank's total assets that is used to finance loans which in the opinion of Parvash and Afroze (2014) signifies the bank's aggressiveness in granting credits to generate the bulk of their income through interest when a sizeable amount of their assets are given out as loans and advances. LAR also measures the total loans outstanding as a percentage of total assets. It is determined by dividing total loan amount by total assets. A higher loan-to-assets ratio represents high credit level and an increasing chance of credit risk to assess the liquidity status of a bank by

comparing its total loans to its total deposit for the same period. A higher ratio also indicates that a bank is loaned up and its liquidity is low.

Figure 1: **The Conceptual Model.**



Source: *Researcher's Model, 2023*

In the above model, non-performing loan is the dependent variable measured by the ratio of bad credit in a bank's loan portfolio to the total amount of outstanding loans and advances in the bank's custody. Similarly, ownership concentration, Operational efficiency, capital adequacy, Return on asset, and loan-to-asset-ratio are the independent variables used to explain NPLs. total assets.

Empirical Review

Several studies conducted to examine the effect of bank-specific attributes on NPLs of deposit money banks in Nigeria showed mixed results as captured below:

Mohammed (2022) investigated the effect of firm's specific attributes on non-performing loans of listed deposit money banks in Nigeria. Firm attributes were proxied by (firm's size, liquidity and capital adequacy) while non-performing loans was proxied by (the ratio of non-performing loans to total loan). 2010-2019 were the periods under review. The study adopts the ex-post-facto research design. Annual data used in the study were sourced from the Nigerian Exchange Group and the financial statements of the banks. Descriptive statistics, correlation matrix and the ordinary least square (OLS) multiple regression techniques were the main statistical tools used in the analysis of data. The result of the regression revealed that, firm size and liquidity have no significant effect of non-performing loan, while capital adequacy has significant effect on non-performing loans. Based on the findings, the study concluded that the CBN should raise capital adequacy ratio from 10% since increasing CAR reduces NPLs based on the findings of this study.

William and Clement (2020) analyzed the influence of bank specific factors on the level of non-performing loans among the commercial banks in Kenya. This study employed descriptive research design using the forty-three (43) currently licensed commercial banks as its target population. Using census, the study collected secondary data from the previous year's financials statement and other financial reports for period covering 2012 to 2016. Quantitative analysis was used to produce descriptive statistics and inferential analysis carried out to predict a study model for estimating Non-Performing Loans in terms of banks related factors. The study revealed that the average level of NPLs among Kenyan commercial banks is higher than the threshold of 5% signaling a serious NPLs problem amongst commercial banks in the country. The study concludes that at 5% level of significance; interest rate spread has positive significant influence on NPLs; operating efficiency is directly proportional to non-performing loans, and it has a moderate positive significant influence on the non-performing loans among commercial banks in Kenya; liquidity ratio has a negatively low significant relationship with non-performing loans.; and return on assets has a negative significant influence on NPLs among commercial banks in Kenya. ROA has a negative impact.

Sijabat, *et al.,* (2020) examined the determinants of ownership concentration on bank performance and non-performing loans (risks) of listed banks in Indonesia stock exchange from 2000 to 2018. This research was quantitative research using panel data regression analysis methods. Secondary data was collected from 42 banks listed on the Indonesia Stock Exchange using a purposive sampling technique. This study used Return on Assets (ROA) and Return on Equity (ROE) proxy to measure performance while the standard deviation of returns was used to measure bank non-performing loans (Risks). Findings showed that ownership concentration has a positive impact on non-performing loans. That is, the more concentrated the ownership of the bank, the higher the level of its non-performing loans. This study although conducted in a similar sector but in a foreign country with a different financial system. Besides, the study failed to carryout stationary test of the series which makes the result spurious and unreliable. However, this current study intends to carry out unit root test of all the series used in the study.

Migliardo and Forgione (2018) conduct a study to establish the impact of ownership structure, Banks' profitability, Risk and technical efficiency on 15 European Union (EU) countries. The study used a sample of 1,459 operating banks in EU-15 countries from 2011-2015 and constructs a set of continuous variables capturing the nature of ownership concentration and their interactions. A panel data stochastic frontier analysis was conducted to estimate the time-varying technical efficiency for profitability and costs. Empirical analysis shows that ownership concentration and bank performance are affected by shareholder-type. That is, the large-block shareholders are more

profitable, less risky, and more efficient. The result further reveals that ownership concentration can off-set the negative effect related to the institutional bank and industry-related ownership. This study used a panel data stochastic frontier analysis while the current study adopts the use of panel multiple regression which is considered the most appropriate tool for cause-effect studies. Similarly, the findings of this study may only be applicable to 15 EU countries; hence, there is the need to conduct another study to determine the effect of ownership concentration on bad loans in a developing economy like Nigerian.

Tantiara, *et al.,* (2020) analyzed the effect of capital adequacy ratio, loan-deposit-deposit ratio, and non-performing loans on return on assets with good corporate governance as intervening variable in banking companies listed in the Corporate Governance Perception Index (CGPI) in Indonesia for the period 2014 to 2018. The use of Good Corporate Governance in the study is a recent phenomenon for enhancing bank profitability. Research used purposive sampling techniques and the samples employed in this study were ten (10) of the best banks implementing good corporate governance in Indonesian institute for corporate governance (IICG). Study used secondary data sourced from the annual publications of Indonesian banks with Path analysis technique. Finding shows a significant positive association between capital adequacy and bad loans while loan-to-deposit ratio signified a negative relationship with NPLs. Although the study is current, but it fails to carry out the unit root test and the co-integration of test of the data in the analysis, which may affect the reliability of the findings. However, this current study will carry out the stationarity test of series from 2011 to 2022 which will fill this gap.

Waluyo (2021) determined the effect of Non-Performing Loans and Capital Adequacy Ratio on Return on Assets at PT. Bank Victoria International, Tbk., Jakata, from 2009-2018 period. The method used is explanatory research. The analysis technique used is statistical analysis with regression testing, correlation, determination, and hypothesis testing. The results of this study showed that Non-Performing Loans have a significant effect on Return on Assets by 60.4%, hypothesis testing is obtained t count> t table or (3.496> 2.306). Capital Adequacy Ratio has a significant effect on Return on Assets of 2.8%, hypothesis testing obtained t count <t table or (- 0.477 <2.306). Non-Performing Loan and Capital Adequacy Ratio simultaneously have a significant effect on Return on Assets, the regression equation is Y = 8.666 + 0.569X1 + 0.049X2 and a determination value of 60.8%, hypothesis testing is obtained by the value of F count> F table or (5,431> 4,350).

Cundo, et al. (2022) analyzed the influence of macroeconomic factors projected by inflation and bank-specific factors namely, Return on Asset, Equity to Asset Ratio, and Bank Size on Non-Performing Loan of State-Owned Banks for the period 2017-2021. This type of research is a causal associative study because it was conducted to

determine the effect of Return on Assets, Equity to Asset Ratio, Inflation, and Bank Size on Non-performing State-owned banking Loans for the period 2017-2021. This research data analysis method uses data panel analysis as a data processing tool using EViews version 10. Findings revealed that Return on Assets has a significant negative effect on Non- Performing Loans. Equity to Asset Ratio and bank size have a significant positive effect on Non-Performing Loans. Whereas inflation has a positive effect on Non-Performing Loans.

Rano and Dudi (2022) studied the Impact of Non- Performing Loans, Return on Assets, Return on Equity, and Loan to Deposit Ratios on Minimum Capital Adequacy Requirement Based on Commercial Banks in Indonesia for Business Activities (BUKU) I 2015-2020. The data for this research is obtained from financial reports published by each bank in 2015 to 2020 period. This research uses panel data processed using EViews software version 9.0. The results show that NPL negatively and insignificantly affects CAR. However, ROA gives positive and insignificant impacts toward CAR, while ROE causes negative and insignificant effects on CAR. In addition, there is positive and significant impacts on CAR caused by LDR. Even though this study is current and well researched, but its finding may not apply to Nigerian situation due to differences in the financial and economic system. However, this current study which focused on Nigerian banking system will narrow this gap.

Theoretical framework.

This section explains the related theory which is used in explaining the relationship between bank-specific factors and non-performing loans of deposit money banks in Nigeria to underpin the study.

Bad Management Theory

Bad management hypothesis was first introduced by Berger and De Young (1997). It points out that in responding to the increase in non-performing loans resulting from adverse selection, bank management tends to inject more resources in to managing and monitoring of impaired loans. This development leads to an increase in operating expenses over interest income in the long run, which translates to higher cost-to-income ratio. In fact, higher-cost-to-income ratio is an indication of weak bank management in underwriting, monitoring, and control of loan portfolio (Vardar & Ozguler, 2015; Muratbek, 2017). The relevance of this theory to the study is that bad management is usually associated with inefficiency and adverse selection of borrowers, poor supervision and ineffective monitoring of lending personnels, increase in operating cost with associated hike in the level of bad loans. Consequently, we expect a negative relationship between NPLs and ROA. Bad management theory which breeds inefficiency is the ideal theory that is used to underpin this study.

RESEARCH METHODOLOGY

The study adopted ex-post facto research design which is based on measurable variables and secondary data for 12 years' period covering 2011 to 2022 for deposit money banks in Nigeria.

The population of the study comprised of all the listed deposit money banks in Nigeria as contained in the Nigerian Exchange Group's official website. Current population of the listed deposit money banks in Nigeria are 14 banks (Nigerian Exchange Group, 2022). List of the listed Nigerian deposit money banks that constitute the population are in Table 3.1 below.

Table 1: Population of the Study

S/N	Deposit Money Banks	Date Listed	Date Incorporated
1	Access Bank Plc	-	February, 1989
2	Ecobank Transnational Incorporated	September 11, 2008	October 3, 1985
3	First Bank Holdings Plc	November 26, 2012	August 13, 2012
4	FCMB Group Plc	June 21, 2013	November 20, 2012
5	Fidelity Bank	May 17, 2005	November 19, 1987
6	Guarantee Trust Holding Company Plc	June 24, 2021	July 24, 2020
7	Jaiz Bank Plc	Feb 10, 2017	April 1, 2003
8	Stanbic IBTC Holdings Plc	November 23, 2012	March 14, 2012
9	Sterling Bank Plc	August 17, 1993	November 25, 1960
10	Union Bank Nigeria Plc	March 15, 1971	May 30, 1969
11	United Bank for Africa (UBA)	March 31, 1970	February 23, 1961
12	Unity Bank Plc	October, 1999	April 27, 1987
13	Wema Bank Plc	January 20, 1990	May 2, 1945
14	Zenith Bank Plc	October 21, 2004	May 30, 1990

Source: *Nigerian Exchange Group official website, 2022.*

This study adopted purposive/judgemental sampling technique which gives the researchers the power to choose any members of the population to participate in the survey. The choice of all the eight (8) deposit money banks licensed with international authorities is made because they constitute a greater proportion of beneficiaries of financial service and are by far more representative of the whole banking service providers in Nigeria.

As a result of the above criterion, eight (8) deposit money banks meet the requirement to form the sample size of the study. However, a panel data of eight banks for the period, 2011 to 2022, (12) years, was employed. List of the sample firms include: Access Bank Plc, Fidelity Bank Plc, First City Monument Bank Plc, First Bank

Nigeria Ltd., Guarantee Trust Bank Plc, Union Bank of Nigeria Plc, United Bank for Africa Plc, Zenith Bank plc. Obtained from *Nigerian Exchange Group 2022*

The study employed secondary data derived from annual audited account and financial report of banks published in the Nigerian Stock Exchange Group for the purpose of content validity. Besides, data was derived from annual reports and accounts of the sampled deposit banks and the Nigerian Deposit Insurance Corporation (NDIC) and the Central Bank of Nigeria (CBN).

The study used various statistical tools such as descriptive statistics, correlation and panel regression to test the variables.

Measurement of the Variables

Table 2: Definition of Variables and Measurement

Variable	Type	Measurement	Source
Non-Performing Loans	Dependent	Measured as Non-Performing Loans/Total Loans and Advances	El-Maude, et.al (2017)
Ownership concentration	Independent	Measures the percentage of shares owned by the five largest shareholders in a bank, be it foreign or local.	Nahila and Amarjeet (2016)
Operational efficiency	Independent	Ratio of operating expenses to operating income.	Shaffer (2012)
Capital Adequacy Ratio	Independent	Capital to Risk Assets Ratio. Measured as Total equity/Total asset	Klein, (2013), Makri, et.al.(2014)
Return on Asset	Independent	Net profit to Total assets.	Shingjerji (2013, Swamy (2012)
Loan-to-asset ratio	Independent	Total loans to Total assets.	Chronopoulos et. al. (2013)

Source: Author's compilation (2023)

The model is stated below:

$NPLit = \beta 0 + \beta_1 OWC_{it} + \beta_2 OEF_{it} + \beta_3 CAR_{it} + \beta_4 ROA_{it} + \beta_5 LAR_{it} + \mu_{it}$

Where:

NPL	=	Non-Performing Loans of Banks
$\beta 0$	=	Constant term (intercept);
$\beta_1 - \beta_4$	=	Coefficients for the independent variables
OWC	=	Ownership Concentration
OPE	=	Operational Inefficiency
CAR	=	Capital Adequacy Ratio

ROA = Return on Asset
LAR = Loan-to-Asset Ratio
μ_{it} = Error term.

Result and Discussion.

Table 3: Descriptive statistics of the variables

	NPL	OWC	OEF	CAR	ROA	LAR
Mean	1.118234	7.43E+09	0.602608	4.39E+11	0.133070	1.403545
Median	0.044317	3.61E+09	0.619786	1.21E-09	0.025073	0.414415
Maximum	99.41948	1.07E+11	1.122360	1.89E+13	0.983928	48.93541
Minimum	0.000871	9.74E+08	0.009600	2.24E-10	-0.106113	0.008768
Std. Dev.	9.707479	1.58E+10	0.170548	2.21E+12	0.280597	5.636797
Skewness	9.948092	5.195778	-0.169896	6.550817	2.256318	7.147441
Kurtosis	101.1115	30.06237	4.684409	50.01207	6.275685	55.90857
Jarque-Bera	44262.61	3711.572	13.04105	10519.56	137.3318	13266.16
Probability	0.000000	0.000000	0.001473	0.000000	0.000000	0.000000
Sum	118.5328	7.87E+11	63.87645	4.65E+13	14.10546	148.7757
Sum Sq. Dev.	9894.690	2.62E+22	3.054090	5.15E+26	8.267120	3336.215
Observations	96	96	96	96	96	96

Source: Researcher's Computation Using E-Views 9.0, 2023

The table showed that non-performing loan ratio has a mean value of 1.11 over the period of review. The table revealed that median value of 0.04 which showed that the absence of outliers in the values. The variable has a standard deviation of 9.70 which suggested that the value of the observation was spread across its mean value of 1.11. The skewness statistics of the variable was 9.94, suggesting that it was negative, while the kurtosis statistics of 101.11 suggested that the observation was leptokurtic in distribution. The Jaque-Bera statistics 44262.61 with a probability value of 0.00 suggested that the NPL was not normally distributed at 5% level of significance, and it was log to correct for the purpose of converting it with the same variable measurement.

The table showed that ownership concentration has a mean value (average) of 7.43 over the period of review, median value of 3.61 which showed the absence of outliers in the values, standard deviation of 1.58 which suggested that the value of the observation was spread across its mean value of 7.43, the skewness statistics of the

variable was 5.19, suggesting that it was negative, while the kurtosis statistics of 30.06 suggested that the observation was leptokurtic in distribution, the Jaque-Bera statistics 3711.57 with a probability value of 0.00 suggested that the OWC was not normally distributed at 5% level of significance; the table showed that operational inefficiency has a mean value (average) of 0.60 over the period of review, median value of 0.61 which showed that the absence of outliers in the values; standard deviation of 0.17 which suggested that the value of the observation was spread across its mean value of 0.60; skewness statistics of the variable was (0.16), suggesting that it was negative, while the kurtosis statistics of 4.68 suggested that the observation was leptokurtic in distribution. The Jaque-Bera statistics of 13.04 with a probability value of 0.00 suggested that the OEF was not normally distributed at 5% level of significance.

Capital adequacy ratio has a mean value (average) of 4.39 over the period of review. The table revealed that median value of 1.21 which showed the absence of outliers in the values. The variable has a standard deviation of 2.21 which suggested that the value of the observation was spread across its mean value of 4.39. The skewness statistics of the variable was 6.55, suggesting that it was positive, while the kurtosis statistics of 50.01 suggested that the observation was leptokurtic in distribution. The Jaque-Bera statistics 10519.56 with a probability value of 0.00 suggested that the CAR was not normally distributed at 5% level of significance.

The table showed that return on asset has a mean value (average) of 0.13 over the period of review. The table revealed that median value of 0.02 which showed that the absence of outliers in the values. The variable has a standard deviation of 0.28 which suggested that the value of the observation was spread across its mean value of 0.13. The skewness statistics of the variable was 2.25, suggesting that it was positive, while the kurtosis statistics of 6.27 suggested that the observation was leptokurtic in distribution. The Jaque-Bera statistics 137.3318 with a probability value of 0.00 suggested that the ROA was not normally distributed at 5% level of significance.

Loan-to-Asset Ratio has a mean value (average) of 1.40 over the period of review, median value of 0.41 which showed the absence of outliers in the values, standard deviation of 48.93 which suggested that the value of the observation was spread across its mean value of 1.40, while the skewness statistics of the variable was 7.14, suggesting that it was positive and the kurtosis statistics of 55.90 suggested that the observation was leptokurtic in distribution. The Jaque-Bera statistics 13266.16 with a probability value of 0.00 suggested that the LAR was not normally distributed at 5% level of significance.

Table 4: Correlation Matrix

	NPL	OWN	OEF	CAR	ROA	LAR
NPL	1.000000	-0.039482	0.099523	0.022848	0.276171	-0.027883
OWC	-0.039482	1.000000	0.164105	0.021865	0.224747	0.583901
OEF	0.099523	0.164105	1.000000	0.000495	0.045585	0.254900
CAR	0.022848	0.021865	0.000495	1.000000	0.518072	-0.040208

ROA	0.276171	0.224747	0.045585	0.518072	1.000000	-0.008704
LAR	-0.027883	0.583901	0.254900	-0.040208	-0.008704	1.000000

Source: Researcher's Computation Using E-Views 9.0, 2023

Table 4 indicates that there is a negative/positive association between the dependent variable and independent variables in the study. This implies that there is weak negative association between nonperforming loan ratio and ownership concentration in deposit money banks in Nigeria. Also, there is weak positive association between non-performing loan ratio and operational efficiency in deposit money banks in Nigeria.

Table 4 also implies that there is weak positive association between non-performing loan ratio and capital adequacy ratio in deposit money banks in Nigeria. Similarly, there is weak and positive association between non-performing loan ratio and return on asset in deposit money banks in Nigeria while there is weak negative association between non-performing loan ratio and Loan-to-Asset Ratio of deposit money banks in Nigeria.

The table further revealed that there is weak positive association between ownership concentration and operational inefficiency in deposit money banks in Nigeria. Also, there is weak positive association between ownership concentration and capital adequacy ratio in deposit money banks in Nigeria. It is noted that there is weak positive association between ownership concentration and return on asset of deposit money banks in Nigeria. It is also revealed that there is weak positive association between ownership concentration and Loan-to-Asset Ratio of deposit money banks in Nigeria.

The finding shows that there is a positive association between operational efficiency and capital adequacy ratio of deposit money banks in Nigeria. There is a positive association between operational efficiency and return on asset of deposit money banks in Nigeria while there is a positive association between operational efficiency and Loan-to-Asset Ratio of deposit money banks in Nigeria.

The table also noted that there is a positive association between capital adequacy ratio and return on asset of deposit money banks in Nigeria. Also, there is a positive association between capital adequacy ratio and Loan-to-Asset Ratio of deposit money banks in Nigeria. It is noted that there is a positive association between return on asset and Loan-to-Asset Ratio of deposit money banks in Nigeria. There is no strong correlation between the variables and then there is no problem of multicollinearity.

Test of Hypotheses

The data was tested using panel regression to analyze the data on bank specific attributes proxies and non-performing loans in Deposit Money Banks in Nigeria.

Table 5: Variance Inflation Factors

Variance Inflation Factors
Date: 05/29/23 Time: 01:31
Sample: 1 106
Included observations: 106

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	11.65094	14.22100	NA
OWC	5.54E-21	2.043211	1.670016
OEF	30.49478	14.58894	1.072434
LAR	0.042588	1.738495	1.636092
CAR	2.34E-25	1.441649	1.386610
ROA	15.79287	1.844758	1.503414

The VIF for OWC, OEF, LAR, CAR and ROA are 1.67, 1.07, 1.63, 1.38 and 1.50 respectively. This shows that the VIF are less than 10 respectively. Thus, the study concluded that there is no problem of multicollinearity. However, multicollinearity exists only when VIF is greater the10.

Table 6: The Breusch Pegan Test of Heteroskedasticity

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	3.056043	Prob. F(5,100)	0.5131
Obs*R-squared	14.05014	Prob. Chi-Square(5)	0.6153
Scaled explained SS	494.2322	Prob. Chi-Square(5)	0.7080

The Breusch Pegan Test of Heteroskedasticity given the observed R-squared of the auxiliary regression and its corresponding P-value of 0.6153 indicates that there is no problem of heteroskedasticity in the work.

Table 7: Lagrange multiplier test

Lagrange Multiplier Tests for Random Effects
Null hypotheses: No effects
Alternative hypotheses: Two-sided (Breusch-Pagan) and one-sided (all others) alternatives

	Test Hypothesis		
	Cross-section	Time	Both
Breusch-Pagan	0.743619	0.278547	1.022166
	(0.0085)	(0.5977)	(0.3120)

Honda	0.862334	-0.527775	0.236568
	(0.1943)	--	(0.4065)
King-Wu	0.862334	-0.527775	0.313672
	(0.1943)	--	(0.3769)
Standardized Honda	1.315835	-0.323024	-3.127542
	(0.0941)	--	--
Standardized King-Wu	1.315835	-0.323024	-3.009966
	(0.0941)	--	--
Gourierioux, et al.*	--	--	0.743619
			(>= 0.10)

*Mixed chi-square asymptotic critical values:

1%	7.289
5%	4.321
10%	2.952

The test (LM) is a test to determine whether Random Effect model is better than Common Effect. (PLS) method used. If Result: H0: Select CE (p> 0.05) and H1: Select RE (p <0.05). **The** value of P Value is shown by the number below which is 0.008 where the value is less than 0.05. So the Lagrange Multiplier Test indicates that receiving H1 means the best estimation method is Random Effect. If the value of p value is greater than 0.05 then receive H0 which means the best estimation method is Common Effect. In this study, random effect is better than fixed effect.

Table 8: Hausman Test Result

Correlated Random Effects - Hausman Test

Equation: Untitled

Test cross-section random effects

Test Summary	**Chi-Sq. Statistic**	**Chi-Sq. d.f.**	**Prob.**
Cross-section random	2.328406	5	0.8021

Cross-section random effects test comparisons:

Variable	**Fixed**	**Random**	**Var(Diff.)**	**Prob.**
OWC	-0.000000	-0.000000	0.000000	0.7194
OEF	1.294608	3.576970	7.164139	0.3938
CAR	-0.000000	-0.000000	0.000000	0.3541
ROA	17.277914	15.646709	2.025651	0.2517
LAR	0.120572	0.098766	0.000913	0.4704

Source: Researcher's Computation Using E-Views 9.0, 2023

The Hausman test showed that random effect model is the most appropriate to fixed effect model given the probability value of more than 0.05. Thus, the null hypothesis which states that random effect model is more appropriate is accepted.

Table 9: Panel Regression Result

Dependent Variable: NPL
Method: Panel EGLS (Cross-section random effects)
Date: 03/16/23 Time: 19:37
Sample: 2011 2022
Periods included: 12
Cross-sections included: 9
Total panel (unbalanced) observations: 106
Swamy and Arora estimator of component variances

Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	-2.150986	3.783107	-0.568576	0.5709
OWC	-9.74E-11	7.55E-11	-1.290385	0.1999
OEF	3.576970	5.964810	0.599679	0.5501
CAR	-8.75E-13	4.84E-13	-1.807123	0.0738
ROA	15.64671	4.162046	3.759380	0.0003
LAR	0.098766	0.204871	0.482089	0.6308
	Effects Specification			
			S.D.	Rho
Cross-section random			3.125162	0.1049
Idiosyncratic r				
Andom			9.130235	0.8951
	Weighted Statistics			
R-squared	0.532748	Mean dependent var		0.721119
Adjusted R-squared	0.489385	S.D. dependent var		9.441387
S.E. of regression	9.009804	Sum squared resid		8117.657
F-statistic	3.061340	Durbin-Watson stat		1.026547
Prob(F-statistic)	0.012977			
	Unweighted Statistics			
R-squared	0.539135	Mean dependent var		1.118234
Sum squared resid	8715.888	Durbin-Watson stat		0.956088

Source: E-view, version 9.00

Decision rule: 5%

The regression result shows that the model is fit for the study since the f-statistics is significant at 5% level of significant. The result also shows that ownership concentration (OWC) has negative effect on non-performing loan of deposit money banks in Nigeria. This effect is insignificant since the P-value of 0.1999 is greater than

5%. Thus, we have no reason to reject the null hypothesis and concluded that ownership concentration (OWC) has negative and insignificant effect on non-performing loan of deposit money banks in Nigeria.

The result also shows that operating efficiency (OEF) has positive effect on non-performing loan of deposit money banks in Nigeria. This effect is insignificant since the P-value of 0.5501 is greater than 5% level of significance. Thus, we have no reason to reject the null hypothesis and conclude that operating efficiency (OEF) has positive and significant effect on non-performing loan of deposit money banks in Nigeria.

Furthermore, the finding revealed that capital adequacy ratio (CAR) has positive effect on non-performing loan of deposit money banks in Nigeria. This effect is insignificant since the P-value of 0.0738 is greater than 5% level of significance. Thus, we have no reason to reject the null hypothesis and concluded that capital adequacy ratio (CAR) has positive and insignificant effect on non-performing loan of deposit money banks in Nigeria.

The finding on profitability proxied by return on asset (ROA) has positive effect on non-performing loan of deposit money banks in Nigeria. This effect is significant since the P-value of 0.0003 is less than 5% level of significance. Thus, we can reject the null hypothesis and concluded that return on asset (ROA) has positive and significant effect on non-performing loan of deposit money banks in Nigeria.

The finding on Loan-to-asset ratio (LAR) signified a negative effect on non-performing loan of deposit money banks in Nigeria. This effect is insignificant since the P-value of 0.6308 is greater than 5% level of significance. Thus, we have no reason to reject the null hypothesis and conclude that Loan-to-asset ratio (LAR) has negative and insignificant effect on non-performing loan of deposit money banks in Nigeria.

The $R^2 = 0.53$ indicates that only 53% of variation on bank specific variables can be used to explain non-performing loan of deposit money banks in Nigeria but 47% can be explained by other factors not noted in the regression model which is referred to as error term.

Discussion of Findings

The results of the analysis indicate that bank specific attributes have significant effect on non-performing loan of deposit money banks in Nigeria. The study is in line with the finding of Winfred (2020); Mehmet and Zeynep (2022) who established a statistical insignificant effect of bank specific variables on non-performing loans.

Hypothesis 1 established that ownership concentration has negative and insignificant effect on non-performing loan of deposit money banks in Nigeria. The study is in line with the findings of Migliardo and Fabio (2018) who found that there is negative effect of ownership concentration on non-performing loans of deposit money banks in Nigeria, while the study disagreed with the findings of Sijabat et.al., (2020) who found

that there is positive and significant effect of ownership concentration on non-performing assets of deposit money banks in Nigeria. Maximizing profit.

In Hypothesis 2, the study found that operating efficiency (OEF) has positive and insignificant effect on non-performing loan of deposit money banks in Nigeria**.**

Hypothesis 3, the study found that capital adequacy ratio (CAR) has negative and insignificant effect on non-performing loans of deposit money banks in Nigeria. The study is not line with the findings of Eka and Aliamin (2018); Tantiara, *et al.,* (2020); Ni and Ni (2021); Waluyo (2021) Uddin (2022) who found statistical positive and significant effect of capital adequacy on non-performing loans in deposit money banks in Nigeria.

In hypothesis 4, the study established that return on asset (ROA) has positive and significant effect on non-performing loan of deposit money banks in Nigeria. The study is in-line with the findings of Singh, et.al., (2021); Cundo et al., (2022) who found a statistically positive and significant effect of return-on-asset on non-performing loans. The study however agreed with the findings of Rano and Dudi (2022) who found a statistical insignificant effect of return on asset on nonperforming loans.

In Hypothesis 5, the study found that total loan-to-total asset ratio (LAR) has positive and insignificant effect on non-performing loans of deposit money banks in Nigeria. The study is in line with the findings of Irwan, et al., (2019) who found that there is positive and significant effect of loan-to-asset ratio on NPLs of deposit money banks in Nigeria.

Conclusion

The study concluded that bank specific attributes have positive effect on non-performing loans of deposit money banks in Nigeria. This implies that bank specific variables contribute positively to non-performing loan of deposit money banks in Nigeria.

Recommendations

Based on the findings of this study, the research work portrays the urgent need for deposit money banks in Nigeria to intensify efforts towards credit appraisal and loan administration to curb the escalating rate of bad loans in the banking sector, even as the regulatory authority devotes more efforts towards banks' compliance to relevant provisions of banks and other financial institutions Act [1999] as amended and other prudential guidelines.

The following are the recommendations based on the study findings on variables which significantly predicted the levels of non-performing loans.

i. **Ownership concentration** (OWN). The study therefore recommended that banks should gear efforts towards advancing credit that has the highest income generating capacity to boost performance. However, this lending activities

should be professionally handled by well-trained and competent personnel to forestall the de-generation of credits in to non-performing category.

ii. Operational efficiency. It is recommended that banks should re-strategize and match their operating expenses to their operating income viewed from both cost and profitability perspective to curb the rising position of NPL and boost profitability.

iii. Capital adequacy ratio (CAR). Study recommended that bank's capital should always be enhanced to mitigate the level of bad loans. This is because past findings have shown that banks with huge capital adequacy are not likely to fall in to the temptation of reckless granting of loans and advances to generate income.

iv. Return on asset (ROA). Study recommends that banks should exercise more caution in granting its credit to sustain and enhance future performance. This is because granting more credit to boost income is associated with higher chances of recording higher level of NPLs.

v. Loan-to-asset-ratio (LAR). It is recommended that bank management should adopt sound liquidity management techniques to minimize the rising position of NPLs in the banking system. That is, banks should strictly maintain a balance between total loans amount and total asset as the present position which appears satisfactory should be sustained and improved to forestall the rising position of bad loans.

Suggestion for Further study

There are several potential opportunities to be considered in the future for further studies and improvements. Subsequent studies can focus on the composite effects of bank specific variables and efficiency of firms using multivariate techniques like canonical correlation, structural equation modelling. Further studies can also be carried out to evaluate the effect of bank specific variables on the efficiency of manufacturing companies in Nigeria.

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