RESEARCH ARTICLE

Impact of assets and liability on the efficiency of banks in Nigeria

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Abstract

To demonstrate the extent to which key bank performance indicators influence the bank's net interest margin, the research gauge the assets and liability of bank by use of: capital ratio (BACAR); Bank Loans (BLOAN); Asset Quality (BAQUA); Bank Deposits (BADEP); Deposit Rate (BDERA) and Bank Interest Spread (BISPE). The ex post facto research design was used. Whereas, quantitative data analysis was employed. The design involved the collection of secondary time series data from online data base. The population comprised banks while commercial banks serve as sample. The published CBN statistical Bulletin and World Bank indicators for the financial period of 1993 through 2022 were used. Results show that BACAR, BLOAN, BAQUA and BDERA has significant and beneficial values. BADEP shows negative but not significant values. BISPE confirms negative but not significant values). The regressed model clarifies 62.88% changeability in the net interest margin (R-squared = 0.6288), and the model is statistically significant. Sequel to the results, the study recommends that banks should prioritize increasing their capital base to improve risk supervision and boost profitability. Governing authorities should authorize that banks maintain adequate capital buffers. Banks should seek to increase their loan portfolios by exploring new credit markets and improving the creditworthiness of potential borrowers.

Keywords: Assets; Loan; Liability; Deposit; Efficiency; Banks

Introduction

The efficiency of banks has a crucial part in the economic stability and growth of a state, particularly in a developing economy like Nigeria. Central to this, efficiency is the administration of resources and obligations, which directly influence a bank's profitability, risk management, and overall performance (Obasan & Ojapinwa, 2021). Hunjra et al (2021) opined that efficiency is the ability of banks to optimize resource utilization and operational processes influenced by internal governance practices and external market conditions. Also, efficiency is seen as the degree to which a bank can minimize its costs while maintaining a given level of output or service quality (Sathye, 2001). Understanding the effects of assets and liabilities on bank efficiency is crucial for policymakers, regulators, investors, and banking professionals alike. In Nigeria's banking industry, the interplay between assets (resources) and liabilities (obligations) has been a subject of significant scrutiny and debate, particularly considering regulatory reforms, economic fluctuations, and technological advancements (Aroghene & Imene, 2023). Base on the opinion of Căpraru and Ihnatov (2024) Stricter regulatory frameworks like Basel III influence bank profitability and efficiency. While tighter capital requirements may reduce profit efficiency.

Consistent with the Nigerian central bank (CBN) supervisory reports (2018), bank's operational efficiency can be measured using various ratios such as net interest margin, yield on earnings assets, equity return, return on assets and efficiency ratio. Bank's efficiency is not only a key indicator of their financial health but also a crucial determinant of the overall stability and growth in the economy (Tolulope & Adeola, 2021). In the Nigerian context, where the banking system serves as a cornerstone of financial intermediation then economic change, understanding the intricate dynamics between asset and liability management is paramount. Resources and liabilities of banks embody the fundamental building blocks of their balance sheets, encompassing a diverse array of financial instruments, loans, deposits, and extra financial obligations (Bolaji & Olabisi, 2022). Effective management of these elements is essential for banks to fulfill their primary functions of intermediating funds, managing risks, and generating returns for shareholders (Adeoti & Adaramola, 2021; Imene, 2023). Scrutinizing the upshot of asset and obligations on bank efficiency will not be completed without consideration to essential variables that may impact the relationship. Such variables are asset quality, asset diversification, asset liquidity, liability structure, funding costs, capital adequacy, profitability measures, efficiency ratios, loan-to-deposit ratio, interest percentage risk, regulatory environment and technological innovation (Damilola & Olabisi, 2020). Asset quality include metrics such as non-performing loan ratio, loan loss provisions, and credit risk assessments. Asset diversification measure the range to which banks diversify their asset groups crosswise diverse asset groups, sectors, and geographical regions (Adeolu &Amoo, 2023; Funmilayo & Akinola, 2023). Asset liquidity evaluate the liquidity profile of bank assets, including the proportion of liquid assets such as cash and short-term securities; liability structure assesses the composition of bank liabilities, including the mix of deposits, borrowings, and other funding sources (Adewale & Ibrahim, 2023); funding costs analyzes the cost of funds for banks, including interest expenses on deposits and other liabilities; capital adequacy examine the adequacy of capital reserves relative to risk-weighted assets as per regulatory requirements(Obasan & Ojapinwa, 2021); profitability measures include metrics such as assets return (ROA) and equity return (ROE) to assess bank profitability; efficiency ratios utilize measures like the efficiency ratio (operating expenses as a percentage of revenues) to gauge operational efficiency; loan-to-deposit ratio evaluate the fraction of loans to customer deposits, indicates the bank's lending activity relative to its deposit base; interest rate risk assesses responsiveness of bank earnings and capital to variations in rates of interest, considering the maturity profiles of resources and liabilities(obligations); regulatory environment consider regulatory factors that may influence asset and liability management practices such as adequate capital provisions and liquidity regulations; finally, technological innovation disclose bearing of technological advancements on bank efficiency, including digitalization efforts and fintech partnerships (Femi & Funmilayo, 2022). The influence of bank loan, bank deposit, inflation, automated teller machine (ATM) deployment, and the number of commercial bank branches on the profit margin of banks in Nigeria requires examination to understand its implications for the banking sector's profitability and stability (Blessing & Emmanuel, 2022). The height of bank loans extended by Nigerian banks can influence their net return margin. Higher loan disbursement might increase interest proceeds but also elevate fund risk then provisioning costs, potentially affecting the net return negatively (Adebisi & Yusuf, 2020). According to Albulescu et al., (2024) the ratio of loans to deposits, influences profitability positively, as it reflects banks' ability to supply credit based on deposits. However, poor liquidity management can lead to bank failures and reduced profitability. Also, during crises such as COVID-19, higher capital and liquidity buffers allowed banks to sustain profitability and support customers effectively (Galvis-Ciro et al., 2024). Likewise, the volume of deposits held by banks affects their interest income, as deposits aid as key avenue of resources for lending actions. Changes in deposit levels may impact the return margin, especially if banks face challenges in attracting and retaining deposits amidst competition (Ibrahim & Uba, 2019).

In the dynamic landscape of the bank's sector, efficient administration of resources and obligations is crucial for sustaining profitability, enhancing risk control, then ensuring the overall stability of finance institutions. However, despite its significance, the precise association amid asset and liability composition and bank efficiency remains a subject of ongoing debate and empirical inquiry. It is essential for banks to carefully monitor and manage these variables to maintain efficiency and sustainable growth (Chioma & Adebayo, 2022). Studies by Ajibola and Oladapo (2022) highlighted the significance of asset liquidity and maturity matching in optimizing resource utilization and mitigating liquidity risk of banks in Nigerian. Additionally, findings from Adewale and Ibrahim (2023) underscore the role of liability structure in influencing funding costs, adequate capital, then overall profit of banks operating in Nigeria. Recent developments popular within Nigeria bank's landscape including regulatory reforms, technological innovations, and changing market dynamics, have underscored the importance of prudent asset and liability management practices. Against this backdrop, the research sought to elucidate the impact of assets (bank capital to asset ratio, bank credit to bank deposits (%), bank non performing loan to total gross loan) and liability compositions (bank deposits to GDP (%), deposit interest rate, interest rate spread) on bank's efficiency in Nigeria.

Literature Review

Concept of Bank Assets

Bank assets refer to the various financial resources owned or controlled by a bank that contribute to its value and ability to generate income. These assets represent the investments, loans, and other financial instruments held by the bank as part of its business operations. Bank assets can be categorized into several main types such as cash and cash equivalents, loans and advances, investments, reserves and deposits with other banks, property, plant, and equipment and intangible assets (Adebayo & Olufemi (2023). Managing credit risk remains a significant challenge, particularly in periods of economic uncertainty. Banks must carefully assess borrowers' creditworthiness and maintain adequate provisions for potential losses (International Monetary Fund, 2022). Overall, bank assets play a crucial role in determining monetary strength, profitability, and risk content of a bank. Effective management of these assets is essential for banks to achieve their financial objectives and fulfill their obligations to depositors and other stakeholders.

Bank Capital Ratio (BACAR)

It signifies the bank's ability to absorb losses and maintain solvency. A higher capital to asset ratio indicates a more stable bank that can weather economic downturns and financial shocks better (Udegbunam & Nwobu, 2020; Aroghene, 2022). It enhances the bank's ability to attract deposits and borrow funds at lower costs. This ratio stands as vital measure in assessing a bank's overall monetary well-being and stability. According to Căpraru & Ihnatov (2024), well-capitalized banks under Basel regulations demonstrate enhanced profitability, suggesting their capacity to offset regulatory pressures. The bank capital ratio, also known as the adequate capital ratio (CAR), stands as gauge of a bank's capital relative to risk assets. It is a critical metric used to assess a bank's pecuniary strong point and stability. The capital ratio helps ensure that a bank can grip a reasonable amount of cost and complies with statutory capital requirements. Recent regulatory frameworks like Basel III emphasize higher capital ratios to enhance bank resilience. The minimum requirement for the Common Equity Tier 1 (CET1) ratio under Basel III is 4.5%, but many banks aim for higher ratios to maintain a buffer against potential financial shocks (Bank for International Settlements, 2021). For this study, BACAR was measured by bank capital to asset ratio.

Bank Loan (BLOAN)

BLOAN measures how much credit extended related to customer deposits. They are monetary products which bank lend to borrowers with prospect of settlement with interest. They also stand as primary asset and significant source of income through amount charged. A higher ratio could indicate that the bank is lending out more funds compared to the deposits it holds, which may lead to liquidity risks if too many loans become non-performing (Adeusi & Ismail, 2021). Interestingly, a low proportion might suggest   banks are underutilizing its deposits efficiently for lending purposes. The pandemic of COVID-19 significantly impacted loan portfolios, with many banks increasing their provisions for loan losses due to rising defaults. However, the introduction of government-backed loan programs helped mitigate some negative impacts (World Bank, 2021). S&P Global Analysts (2024) explore the effects of diversified loan portfolios and regulatory compliance on mitigating risks related to asset-liability mismatches. Their research emphasizes the importance of liquidity management in maintaining profitability amidst policy normalization and rate hikes. According to Albulescu et al., (2024) the ratio of loans to deposits, influences profitability positively, as it reflects banks' ability to supply credit based on deposits. Moreover, digital transformation has led to innovative loan products and faster processing times. For this study, BLOAN was measured by bank credit to bank deposit ratio.

Bank Asset Quality (BAQUA)

This ratio reflects eminence among bank's loan. It refers to the health also outcome of assets, particularly its loan portfolio. Better asset worth designates bank's loan are performing well and nonpayment is low. Higher percentage points at sufficient level of risk associated with bank's loaning operations, which can impact profitability and efficiency. Credit risk (CR) negatively impacts profitability, as poor-quality loans result in reduced interest income (Galvis-Ciro et al., 2024). Worth of assets has been a focal point for regulators, especially economic uncertainties brought about by the pandemic. Banks had to boost credit assessment processes and adopt more stringent risk management practices to maintain asset quality (Aroghene & Ikeora, 2022; International Monetary Fund, 2022). BAQUA was measured by Bank non-performing loan to total gross loan ratio.

Concept of Bank Liability

Liabilities of bank remain the financial obligations and sum unpaid payable to depositors, creditors, besides other investors. These liabilities represent avenue of funds bank use to finance their processes and investments. Bank liabilities are obligations they owes to others, including deposits, borrowed funds, together with financial obligations. Managing liabilities effectively is needed to sustain funds and ensure they meet interim and long-standing obligations. Liability management has become increasingly sophisticated, with mix of short-range and long-term funding sources. The focus has shifted towards more stable funding sources to enhance fund availability and reduce of funding mismatches (European Central Bank, 2022). Liabilities/obligations can be split into several categories: deposits, borrowings, bank-owned resources. Deposits connotes funds held by the bank on behalf of customers, including individuals, businesses, also other monetary institutes. These funds are repayable to depositors on demand or in terms of the agreements (Bolaji & Olabisi, 2022). They are prime source of funding which can include various types such as demand deposits, savings deposits, and time deposits. Meanwhile, borrowings consisted funds banks may borrow from divers financial institutions, government agencies, or markets long term instruments to supplement their deposit funding. Borrowings can take the form of interbank loans, repurchase agreements (repos), commercial paper, bonds, or other debt instruments (Olufemi

& Ademola, 2020). These liabilities typically have fixed terms and interest. The variables employed to gauge liability of banks in this study is discussed therewith:

Bank Deposit (BADEP)

BADEP is the whole value of bank sector deposit in a country to its gross domestic product (GDP). It shows capacity to mobilize savings within the economy. Bank deposits are funds placed into banking institutions by individuals, businesses, and governments. Deposits consists major liability for banks but are crucial for providing the necessary liquidity for loaning with other banking activities. Albulescu et al., (2024) opined that, poor liquidity management can lead to bank failures and reduced profitability. A higher ratio suggests bank's sector plays a significant part in the state of economy, which can impact efficiency by influencing lending practices, rates then overall financial stability (Olalekan & Abiodun, 2023). During COVID-19 disease, there stood a substantial surge in bank deposits as clients and industries sought safety and liquidity. This trend has persisted, highlighting standing of deposits as funding source for banks (World Bank, 2021). Banks in economies having more BADEP may expect greater regulatory scrutiny and pressure to support economic growth. Bank deposits was measured by bank deposits to GDP (%)

Bank Interest Spread (BISPE)

This represents the variance amid rate of interest at which banks lend and rate at which they borrow. The bank interest spread is variance amid interest bank charges on loans and the rate of interest it pays on deposits. This spread is main foundation of earnings for banks. Complex spread indicates higher profitability, but then it could reflect inefficiencies in the system, namely market concentration, lack of competition, or regulatory constraints (Adebayo & Dada, 2022). A wider interest rate spread may indicate lower efficiency in the allocation of financial resources. Interest spreads have been under pressure due to historically low interest rates. Banks have had to find new ways to maintain profitability, such as through fee-based services and cost efficiencies (International Monetary Fund, 2022). According to Albulescu et al., (2024) efficient management of total costs relative to total revenues is critical to profitability. Hall and Brock (2024) discuss how changes in interest rates influence bank profitability by altering the spread between lending rates and deposit rates. Their result emphasizes that rising rates improve returns on assets but require strategic liability management to balance costs effectively.

Bank Deposit Rate (BDERA)

BDERA is the rate of interest offered on deposits. It can impact both the bank's funding cost besides its capability to entice deposits. Higher rates may increase funding costs for bank, reducing profit margins and potentially impacting efficiency (Daniel & Deborah, 2020). Conversely, offering lower deposit rates could help reduce funding costs but may also impact the tendencies to attract and retain customers. To Căpraru and Ihnatov (2024), high-interest rates present mixed results, benefiting profitability through higher spreads but potentially increasing borrower defaults. BDERA was be measured by deposit interest rate. Overall, bank liabilities epitomize avenue of funding banks utilize in financing their asset portfolios and conduct their business activities (Aroghene et al., 2023). Effective management of these liabilities becomes imperative for maintaining liquidity, solvency, and stability in the finance system.

Concept of Bank Efficiency

Bank efficiency is the proper administration of resources and obligations, which directly influence a bank's profitability, risk supervision, then overall performance. It involves evaluating aspects like bank's cost structure, operational processes, employee productivity, technological investments, and customer service quality (Olalekan and Abiodun, 2023). Improving bank productivity is vital intended for enhancing financial performance, competitiveness, besides customer gratification. Bank efficiency refers to ability to operate in a cost-effective manner while providing high-quality services and generating satisfactory profits. Operational efficiency is often measured using ratios like net interest margin, yield on earnings assets, assets return, equity return and efficiency ratio (CBN, 2018).

Bank Net Interest Margin (BANIM)

BANIM gauges interest income received on loans with investments divided by interest expenses remunerated on deposits too borrowings. It is usually presented among the performance trend of bank operations in every bank supervisory report of central bank for each reporting year (CBN, 2018). This is to reveal thus far banks fared. BANIM reflects the bank's success and competence in managing its interest risk, loan pricing and funding costs. Wadood et al. (2020) stated that earnings from these transactions (loans/resources & deposits/obligations) is a traditional income generating activities. A higher BANIM designates improved profit. Meagre BANIM may signal competitive pressures, rising funding costs, or narrow lending margins. The Interest Margin of banks is predisposed to complex interplay of factors, including the interest proportion environment, economic conditions, bank-specific factors, regulatory policies, market competition, and technological advancements. Understanding these factors stays central for to manage profitability including pecuniary stability effectively. Several factors influence interest margin (BANIM), bank's profit and overall financial well-being. Demirgüç-Kunt and Huizinga (2020), stated, macroeconomic conditions, such as GDP growth and inflation, influence NIM. Strong economic growth often leads to increased loan demand, allowing banks to charge higher interest rates, which improves BANIM.

Regulatory Overview of assets and liabilities of banks in Nigeria

The law that regulates the assets/resources and liabilities (obligation) of banks is primarily governed by the Banks and Other Financial Institutions Act (BOFIA). This legislation provides a comprehensive framework for the operation and supervision of banks also other financial institutions in Nigeria, including provisions regarding their assets, liabilities, and risk management practices. When bank executives are prosecuted for fraudulent activities, it not only damages the reputation of the individuals involved but also undermines trust in the banking system as a whole. Regulators and law enforcement agencies perform central part in inspecting and arraigning such cases to maintain the integrity of the financial sector. The Act (BOFIA) is a piece of legislation that governs the operations of banks and other financial institutions in the country. Enacted in 1991, BOFIA has undergone several amendments to adapt to the changing dynamics of financial industry.

Theoretical Framework

Aggregate Production Function (APF) Theory

The APF theory can be traced back to the work of economist Robert Solow in the 1950s. Solow's research laid the foundation for understanding how inputs such as labor, capital, and technology combine to produce output in an economy. Regarding the situation of how assets and liability affects the efficiency of bank, this theory provides a framework for analyzing the factors influencing the overall output or productivity of the banking sector.

Financial Intermediation (FI) Theory

Financial intermediation theory has roots in the works of economists such as John Gurley and Edward Shaw, whose seminal book "Money in a Theory of Finance" (1960) explored the role of financial intermediaries in channeling funds from savers to investors. Concerning effect of assets and liability on the efficiency of banks, FI theory helps to understand how banks facilitate apportionment of capital and resources within the economy. This theory highlights the crucial role of banks in mobilizing savings, providing credit to businesses, and fostering investment.

Banking Sector Development (BSD)Theory

The BSD theory draws on the works of economists such as Caprio et al. (2007), who extensively studied association amid advancement of the bank's sector and economic wellbeing. This theory emphasizes the importance of a well-functioning banking sector in promoting economic development in developing economies. In context of this research, banking sector development theory provides insights into aspects namely: financial liberalization, regulatory reforms, and institutional quality impact the proficiency and output of banks, thereby influencing their contribution to overall economic output.

Empirical Review

Bank capital ratio (BACAR) and Net Interest Margin (BANIM)

The effectiveness of banks and E-payment system (EPS) were investigated by Ehiedu et al. in 2023. At a significance level of 0.05, the analysis was conducted using SPSS and a linear regression analysis. They revealed that EPS have not in any way altered the financial turnout. Chortareas et al. (2022) explored outcome of Bank's capital, formation of liquidity, besides economic performance in Asia, concentrating on the period from 2012 to 2021. The study indicated that higher equity-to-asset ratios stayed completely correlated through better efficiency metrics. Bank size and operational effectiveness on profit of deposit money banks (DMBs) was investigated by Yusuf et al. (2021) utilizing secondary data taken from the 2008–2016 monetary accounts of the listed banks. Return on assets (ROA) served as a proxy for profitability, while bank size and operational effectiveness served as proxies for the regressors. The study concluded that profits of DMBs in Nigeria is adversely and negligibly correlated with bank size. Obasan and Ojapinwa (2021) explored bank definite and macroeconomic elements of bank efficiency. Results revealed that bank size, adequate capital, also liquidity positively influenced bank efficiency in Nigeria. However, NPLs negatively affected bank efficiency. Size of

bank including operational effectiveness on profit of DMBs 2008 to 2016 was examined by Yusuf et al. (2021). Bank size and operational efficiency served as stand-ins for regressors, then ROA served as gauge for profitability. It was determined that despite the banking sector's significant economic contribution to Nigeria, excessive operational costs may be a limiting factor in its profitability. Delis et al. (2021) analyzed quantifying and explaining parameter risk on efficiency of U.S. banks within 2010-2020. They employed stochastic frontier analysis and found that higher adequate capital was significantly associated with higher efficiency scores among U.S. banks. Macroeconomic and bank-centered factors on bank yield was examined by Anande-Kuret al. (2020). Arising from the results, financial outcome is mostly determined by bank-specific criteria such capital efficiency, operational efficiency, loan risk, and size. Iraqi bank profitability was examined by Jadah et al. (2020) in relation to both external and internal factors. For thirteen years, from 2005 to 2017, the study employs unbalanced panel data from eighteen banks in Iraq. A technique based on fixed effects is used to estimate the relationship. The findings of the panel data approach indicate that the profitability of Iraqi banks is significantly and favorably impacted by bank size, the ratios of equity to total assets and total loans to total assets, GDP growth, and government efficacy. Main while, political instability, unemployment, interest rates, inflation, including loan risk all significantly hurt bank profits. Berger and DeYoung (2020) investigated the association of size, complexity, and productivity using a large sample of banks. Observed findings suggest that larger banks tend to exhibit economies of large scale but also face challenges related to organizational complexity, which can affect productivity levels.

Bank Loan (BLOAN) and Net Interest Margin (BANIM)

Chioma and Adebayo (2022) explores how asset-liability management practices impact bank profit in Nigeria. It finds that better asset-liability management tend to generate higher profits. Jude (2022) examines how the composition of bank loan portfolios affects outcome in Nigeria. It finds that a well-diversified loan portfolio contributes to better overall performance. Size, credit quality, and liquidity were examined by Koroleva et al. (2021) as internal characteristics that significantly increase banks' profit. Elements influencing profits in Indonesia, specifically for state-owned banks between 2007 and 2017, were examined by Prasanto et al. (2020). The study's conclusions demonstrated that, over the extensive term, BOPO, LDR, NPLs amid others show a constructive affiliation with banks. From 2010 to 2019, Sun et al. (2020) examined how Asia's banks' efficiency was affected by the swift expansion of loans. Rapid loan growth can initially reduce bank efficiency because of the increasing operational and hazard supervision

Bank Asset Quality (BAQUA) and Net Interest Margin (BANIM)

Funmilayo and Akinola (2023) investigated the connection amid bank efficiency and quality of asset in Nigeria. They exposed that those with higher asset quality tend to be more efficient. Adeolu and Amoo (2023) explored BAQUA and bank performance. They initiated a substantial adverse rapport amid NPLs and bank yield in Nigeria. Higher levels of NPLs were associated with little profit and effectiveness. Adebayo and Olufemi (2023) examined various bank resources and obligations on profitability. They found that active supervision of resources and liabilities, including loan portfolio quality and funding mix, significantly influenced bank profitability. Ayodeji and Babajide (2023) investigated asset quality on the performance of commercial banks. They resolved that higher asset quality, characterized by lower NPLs, tends to achieve better financial performance. Adeolu and Olufemi (2023) examines how asset quality affects the performance of Nigerian banks. It finds that banks with higher asset quality, indicated by lower levels of non-performing loans, tend to have better overall performance. Funmilayo and Akinola (2023) investigates the relationship between bank efficiency and asset

quality in Nigeria. It finds that banks with higher asset quality tend to be more efficient. Ayodele and Olawale (2022) investigated rapport amid bank efficiency and risk management practices in Nigerian banks. It found that banks with more efficient risk management systems tended to achieve higher levels of efficiency. Oluwaseun and Adewale (2022) explored affiliation amongst asset of bank quality then efficiency in banks of Nigerian. They found that banks with higher asset quality tended to exhibit greater efficiency

Bank Deposit (BADEP) and Net Interest Margin (BANIM)

Olalekan and Abiodun (2023) investigated the impact of deposit liabilities on bank efficiency in Nigeria. It found that banks with a higher proportion of stable deposit liabilities tended to achieve greater efficiency, highlighting the importance of deposit funding stability. Obaro et al. (2022) explored Diversification and the performance banking industry's performance within a 22- year period (1999-2020) using time series data of audited reports of the Banks under study. They initiated that modification of resources stirs a more unswerving effects on bank outcome. Krishnan et al. (2022) found that, geographic, functional, and loan portfolio diversification is instrumental to the firmness of the 48 selected banks in India. Yuan et al. (2022) looked into factors that affected the profit of Asian commercial banks between 2010 through 2021. Banks are discovered to have a adverse and substantial Loan to Deposit Ratio (LDR) and Deposit to Asset Ratio (DTAR). Both the Debt-to-Equity Ratio (DER) and the Equity to Asset Ratio (EAR) have no effect. Deposit stability on Middle Eastern banks' efficiency between 2012 through 2020 was investigated by Hassan et al. (2021). Banks with steady deposit bases were proven to be more efficient. By lowering funding precariousness and fund risk, stable deposits let banks better manage their resources and continue to run efficiently.

Bank Deposit Rate (BDERA) and Net Interest Margin (BANIM)

Maria and Hussain (2023) explored evaluated inflation expectation on outcome of commercial banks in India during 2005–2021. Inflation expectation was initiated significant and positive impact on accounting-based measures of banking performance. Ehiedu et al. (2022) explored determinants of financial inclusion (FI) in Nigerian economy deposit interest rate and inflation rate, GDP per capita income, domestic credit to the private sector (% of GDP), amid others stood as useful determinants of FI. Arising from the findings of this study, they concluded that M2/GDP and DEIR are the only outstanding determinants of FI in Nigeria. Torres and Espinoza (2021) examined how different deposit rate strategies affect bank efficiency in Latin American countries from 2013 to 2020. The study found that banks with a strategy of maintaining competitive yet sustainable deposit rates achieved higher efficiency. Ouechtati (2020) examines the effect of financial inclusion on income inequality and poverty in developing nations and finds a negative relationship between financial inclusion and poverty. Pasiouras et al. (2020) examined bank productivity: An international comparison. This research compares bank productivity levels across different countries using advanced econometric techniques. Empirical results reveal significant variations in productivity levels among countries, driven by differences in regulatory environments, market structure, and technological adoption. Calomiris and Carlson (2020) examined the relationship between deposit rates and bank efficiency in U.S. banks from 2011 to 2019. The study found that moderate deposit rates are optimal for bank efficiency. Moderate rates help attract and retain deposits without significantly increasing the cost of funds. This balance enables banks to manage liquidity effectively and optimize their operational efficiency. Adusei and Elliott (2020) focused on the effect of deposit rates on the efficiency of banks in Africa over the period 2010 to 2018. The study found that lower deposit rates generally improve bank efficiency in African banks. Lower rates reduce the banks' interest expenses, freeing up resources for other operational activities and investments that enhance efficiency. However,

extremely low rates could deter deposit inflows, affecting liquidity and stability. Yao et al. (2019) explored deposit rate volatility on the efficiency of banks in Asia over the period 2009 to 2018.The study concluded that high volatility in deposit rates negatively impacts bank efficiency. Frequent changes in deposit rates increase uncertainty and funding costs, which can lead to inefficiencies in resource allocation and operational management. Al-Muharrami and Matthews (2019) analyzed the impact of deposit rates on bank efficiency in the Middle East from 2012 to 2019. The study concluded that lower deposit rates are associated with higher bank efficiency. Reduced interest expenses on deposits allow banks to allocate more resources to improving operational processes and expanding their services. Claessens et al. (2018) analyzed the impact of deposit rates on the efficiency of European banks from 2008 to 2017. The study found that lower deposit rates were associated with higher bank efficiency. Lower rates reduced the cost of funds for banks, enabling them to allocate more resources towards productive activities and operational improvements.

Bank Interest Spread (BISPE) and Net Interest Margin (BANIM)

Mateev (2023) explored market concentration on bank efficiency in emerging economies. Using a trial of 225 banks in 18 countries of Middle East and North Africa (MENA) 2006 through 2020. The analysis finds a strong positive association between market concentration and bank efficiency. Joy and Olawale (2022) investigated affiliation amid bank efficiency and funding structure in Nigeria. It finds that banks with a well-balanced funding structure tend to achieve higher levels of efficiency. Bolaji and Olabisi (2022) analyzed the impact of asset-liability management (ALM) practices on bank efficiency in Nigeria. It found that banks with effective ALM frameworks tended to achieve higher levels of efficiency. Zhu et al. (2021) explored Efficiency and productivity analysis of Pakistan's banking industry. According to empirical findings, international banks have higher mean technical and pure technical efficiency scores than domestic banks; nevertheless, domestic banks have a comparatively higher mean scale efficiency score. Additionally, from 2006 to 2017, public sector banks outperformed the private banking sector. Bolaji and Oluwakemi (2021) investigates the relationship between bank efficiency and liability management practices in Nigeria. It finds that banks with effective liability management tend to achieve higher levels of efficiency and performance. Berger et al (2021) highlighted that the composition of a bank's assets and liabilities affects NIM. Banks having sophisticated proportion of high-yielding assets/resources comparative towards low-yielding assets (like government securities) typically have higher NIMs. Similarly, banks with a greater reliance on low-cost deposits versus high-cost borrowings can maintain a higher NIM. Wadood et al. (2020) examined factors affecting bank profitability in Pakistan. The research examined the relationship between bank specific and macro-economic characteristics over bank profitability by using data of top fifteen Pakistani commercial banks over the period 2011-2016. This research we used the ordinary least square (OLS) method to investigate the impact of assets, non-performing loans, equity, economic growth, interest rate and market capitalization on major profitability indicators i.e., return on asset (ROA), return on equity (ROE), return on capital employed and net interest margin separately. The empirical results have found strong evidence that both internal and external factors have a strong influence on the profitability. Meanwhile, the bank specific factors have a positive correlation to the bank profitability.

Literature Gap

Despite relevant of asset (resources) and liability (obligations) management on bank efficiency, lack of comprehensive research that integrates the multifaceted dimensions of asset and liability composition with efficiency metrics in the Nigerian context existed. Individual studies have examined aspects such as asset quality (Adebayo & Olufemi, 2023), capital adequacy (Hasan et al., 2020), funding sources (Cerqueti et al., 2020) and

operational efficiency (Yusuf et al., 2021). Of the aforementioned literatures each with their diver's outcome. Notably, there exist gap in the literature regarding the holistic assessment of how these factors (bank capital to asset ratio, bank loan, bank asset quality) and liability compositions (bank deposits, bank deposit, bank deposit rate & bank interest spread) collectively influence bank efficiency and performance outcomes in Nigeria. In other to fill this gap the study specifically used: (bank capital to asset ratio, bank loan, bank asset quality) and liability compositions (bank deposits, bank deposit rate & bank interest spread to elucidate their effect on bank efficiency in Nigeria.

Research Methodology

The ex post facto research design was used. This type of research design is used to obtain information concerning the current status of the phenomena and to describe 'what exists' with respect to variables or condition which explicitly suits the topic under study. The design involves collection of secondary time series data from online data base. Banks in Nigeria stood as population while commercial banks serve as the sample. Base on availability, uniformity and timeframe, the aggregate time series data obtain from CBN statistical Bulletin and World Bank Indicators for commercial banks in Nigeria was used for the study. The published CBN statistical Bulletin and World Bank indicators for the financial period of 1993 through 2022 was used to measure the dependent variable and the independent variables. In addition, other information was obtained through references to the library and the review of different articles, online repositories, papers and relevant previous studies. The method of data collection that was used for this study is the electronic method of data collection. This is because the data is already existing and were not collected for the first time by the researchers. Electronic because the data were obtained from online database and repositories which existed in soft copy. Data were collected for: BACAR, BLOAN, AQUA, BADEP, BDERA BISPE and net interest margin of banks (BANIM) for commercial banks in Nigeria. The method that was used for the analysis of data is the quantitative data analysis since it involves numerical data and often includes statistical techniques to identify patterns, relationships, and trends. Statistical package used is econometric views version 9.0. It is one among the statistical packages used in quantitative research in the social sciences and management sciences. The different estimations that done for the study are: descriptive statistics, correlation analysis, multicollinearity, unit root, normality test. While ordinary least square was used to test the hypotheses raised in the study.

Model Specification

The model was adopted from the study of Ini et al (2016) "Modelling banks interest margins in Nigeria". It was stated as:

$$Si, = \alpha + \beta \mathbf{X}i, + \varphi \mathbf{Y}t + \omega \mathbf{Z}t + ui$$

Where:
Si = Represents interest margin for bank i at time t
$\mathbf{X}i$ = Vector of bank specific variables, which varies across banks and time
$\mathbf{Y}t$ = Vector of time varying banking sector specific variables (credit risk, growth in loans and advances, staff operating cost)
$\mathbf{Z}t$ = Vector of macroeconomic variables (GDP growth, inflation rate and money supply growth) which varies with time, but does not vary across banks.
ui = Disturbances across individual banks and time

α, β, φ and ω are constant coefficients for all banks.

Likewise, and Tadele (2016) explored determinants of commercial banks efficiency of selected commercial banks of Ethiopia. The regression model was:

$Yr_{jt} = \beta_0 + \beta_1 CAPSTHjt + \beta_2 LNDEPOjt + \beta_3 LOAQUjt + \beta_4 EXPENjt + \beta_5 PROFjt + \beta_6 LNTAjt + \beta_7 LIQUjt + \beta_8 DIVESjt + \varepsilon jt$

Yr_{jt}	= Efficiency scores
CAPSTH	= Capital strength
LNDEPO	= Logarithm of deposit
LOAQU	= Loan quality
EXPEN	= Expenses
PROF	= Profitability
LNTA	= Asset Size
LIQU	= Liquidity
DIVES	= Diversification
β_0- β_8	= Vectors of coefficient variables
εjt	= Error term

As it pertains to the present research, only the internal factors that relates to bank assets and liabilities were adopted to reflect perception of Nigeria banks. The model of Ini et al (2016) and Tadele (2016), was modified and stated functionally as:

$$BANIM = f (BACAR, BLOAN, AQUA, BADEP, BDERA, BISPE) \qquad \text{eqn (1)}$$

The model is further specified in its econometric form as:

$$BANIM = \beta_0 + \beta_1 BACAR + \beta_2 BLOAN + \beta_3 BAQUA + \beta_4 BADEP + \beta_5 BDERA + \beta_6 BISPE + \varepsilon \qquad \text{eqn(2)}$$

Where:

BANIM	= Net interest margin of banks in Nigeria
β_0	= Intercept
BACAR	= Bank capital ratio
BLOAN	= Bank loan
BAQUA	= Bank asset quality
BADEP	= Bank deposit
BDERA	= Bank deposit rate
BISPE	= Bank interest spread
ε	= Error Term
β_1–β_6	= Coefficient of the Independent Variables.

The a priori expectations of the variables and the error term is in line with the ordinary least square (OLS) assumption.

Table 1: Variables and Measurement

S/N	Variables	Acronyms	Measure	Type of Variable	Source/ Authorities
1	Bank Net Interest Margin	BANIM	Bank net interest margin (%).	Dependent Variable	Ini et al. (2016); Topak and Talu (2016); Wadood et al. (2020)
2	Bank capital ratio	BACAR	Bank capital to asset ratio.	Independent Variable	Cerqueti et al. (2020); Hasan et al. (2020); Chortareas et al. (2022)
3	Bank loan	BLOAN	Bank credit to bank deposits (%)	Independent Variable	Fiordelisiet al. (2018); Sun et al. (2020); Prasanto et al. (2020); Yuan et al. (2022)
4	Bank asset quality	BAQUA	Bank non-performing loan to total gross loan ratio.	Independent Variable	Al-Khouri (2019); Altunbas et al. (2019); Curcio et al. (2019); Louzis et al. (2019); González and Razia (2020); García-Herrero et al. (2021); Berger and DeYoung (2021); Ayodeji and Babajide (2023)
5	Bank Deposits	BADEP	Bank deposits to GDP (%)	Independent Variable	Tadele (2016); Osuagwu et al. (2018); Fanta and Makina (2019)
6	Bank deposit rate	BDERA	Deposit interest rate	Independent Variable	Al-Muharrami and Matthews (2019); Islam and Rana (2019); Adusei and Elliott (2020); Calomiris and Carlson (2020); Ehiedu et al. (2022)
7	Bank interest spread	BISPE	Bank interest rate spread	Independent Variable	Jumono et al. (2019); Altunbas et al. (2019) González and Razia (2020)

Results and Discussions

The secondary data for the variables BANIM, BACAR, BLOAN, BAQUA, BADEP, BDERA and BISPE were obtained from online database and repositories. These data are presented in the appendices section.

Table 2 summarizes the descriptive statistics BANIM, BACAR, BLOAN, BAQUA, BADEP, BDERA and BISPE. BANIM with mean = 1.04, indicates the average for banks is around 1.04%. The standard deviation (0.37) suggests moderate variation. The maximum value is 1.78, while the minimum is 0.35, showing a wide gap of net interest margins among banks. BACAR (Bank Capital Ratio) mean = 0.94, means that banks have an average capital ratio of 0.94. A least worth of 0.17 shows that some banks have very low capital ratios. BLOAN (Bank Loans) Mean = 1.80, reveal average volume of loans is around 1.80. The variation is low, with a Std. Dev of 0.10. BAQUA (Asset Quality): Mean = 0.89, with a relatively small range (min = 0.48, max = 1.35), showing moderate variation in the asset quality. BADEP (Bank Deposits) mean = -1.41, shows a negative value, which could reflect certain aspects of net inflows or withdrawals from deposits. BDERA (Deposit Rate) mean = 0.60, showing BDERA of 0.60%.

Table 2: Descriptive Statistics

	BANIM	BACAR	BLOAN	BAQUA	BADEP	BDERA	BISPE
Mean	1.035830	0.941835	1.802618	0.894653	-1.406202	0.604591	-12.62306
Median	1.019913	0.982271	1.794563	0.923169	-0.740363	0.589873	-13.21699
Maximum	1.779236	1.254064	1.985952	1.354108	0.191580	1.221675	-1.660000
Minimum	0.350248	0.173186	1.574719	0.477121	-4.596785	0.149386	-20.70000
Std. Dev.	0.367550	0.198933	0.097861	0.309902	1.412813	0.260180	3.634691
Skewness	0.783121	-1.870616	-0.469999	-0.025444	-1.425821	0.693376	0.768293
Kurtosis	3.176095	8.747614	2.837863	1.373346	3.631828	3.320775	4.446122
Jarque-Bera	3.105157	58.78985	1.137357	3.310740	10.66384	2.532474	5.565460
Probability	0.211701	0.000000	0.566273	0.191021	0.004835	0.281890	0.061869
Sum	31.07489	28.25504	54.07854	26.83959	-42.18606	18.13774	-378.6917
Sum Sq. Dev.	3.917696	1.147656	0.277728	2.785140	57.88517	1.963119	383.1183
Observations	30	30	30	30	30	30	30

Source: E- Views, 2024.

This variable has a moderate range, from 0.15 to 1.22. BISPE (Bank Interest Spread): Mean = -12.62, with a large negative spread, which could reflect variance in interest income and costs.

The skewness, indicates the asymmetry of the distribution. Interestingly, BACAR is highly negatively skewed (-1.8706), suggesting that most banks possess low capital ratios compared to a few with high values. Also, kurtosis Shows how heavy-tailed or light-tailed the distribution is. BACAR has a high kurtosis (8.7476), indicating existence of outliers or extreme values. Jarque-Bera (JB) Test signifies test of normality. The normality assumption is violated for BACAR and BADEP.

Table 3: Correlation Analysis

	BANIM	BACAR	BLOAN	BAQUA	BADEP	BDERA	BISPE
BANIM	1.000000						
BACAR	0.569817	1.000000					
BLOAN	0.444796	0.241539	1.000000				
BAQUA	0.214219	-0.179746	-0.102718	1.000000			
BADEP	0.079627	0.104966	0.373898	-0.181120	1.000000		
BDERA	0.117390	0.030245	0.122896	-0.179802	0.641069	1.000000	
BISPE	-0.140477	0.028482	-0.043274	-0.075312	0.403763	0.571383	1.000000

Source: E- Views, 2024.

Table 3 confirms pairwise correlations amid the variables. BANIM displayed constructive correlation with BACAR (0.5698), indicating that high capital ratios are connected to high net interest margins. Similarly, BANIM display meaningful correlation with BLOAN (0.4448), meaning higher loan volumes are linked with higher net interest margins. BAQUA and BANIM are moderately correlated. BADEP (Deposits) and BANIM are weakly correlated (0.079), suggesting deposits have minimal influence on net interest margin. BDERA and BANIM is weakly correlated. BANIM is negatively correlated with BISPE (-0.1405), suggesting that as interest

spreads increase, the net interest margin tends to decrease slightly, though the correlation is weak. Interestingly, the correlations highlight that BACAR and BLOAN have the most influence on BANIM.

Table 4: Coefficient Diagnostics Test

Variance Inflation Factors
Date: 09/26/24   Time: 14:13
Sample: 1993 2022
Included observations: 30

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	1.067142	506.3806	NA
BACAR	0.060266	26.46131	1.093996
BLOAN	0.294899	456.0057	1.295464
BAQUA	0.024379	10.33321	1.073970
BADEP	0.002225	4.124944	2.037186
BDERA	0.069332	14.17855	2.152843
BISPE	0.000255	20.80299	1.543569

Source: E- Views, 2024

This table (4) checks for multicollinearity among the independent variables. Centered VIFs for all variables are below 10, indicating low to moderate multicollinearity. For example, BACAR has a VIF of 1.09, and BLOAN has a VIF of 1.30. These values show that multicollinearity is not a major concern.

Table 5: Stability Diagnostics Test

Ramsey RESET Test
Equation: UNTITLED
Specification: BANIM C BACAR BLOAN BAQUA BADEP BDERA BISPE
Omitted Variables: Squares of fitted values

	Value	Df	Probability
t-statistic	1.197520	22	0.2438
F-statistic	1.434054	(1, 22)	0.2438
Likelihood ratio	1.894435	1	0.1687

F-test summary:

	Sum of Sq.	Df	Mean Squares
Test SSR	0.088984	1	0.088984
Restricted SSR	1.454101	23	0.063222
Unrestricted SSR	1.365116	22	0.062051

LR test summary:

	Value	Df
Restricted LogL	2.833992	23
Unrestricted LogL	3.781210	22

Source: E- Views, 2024.

The test in table 5 checks for misspecification whether important variables are missing or the practical form is incorrect. F-statistic: 1.434 (p-value = 0.2438). This specifies the model does not suffer from misspecification because the p-value is non-significant, implying no important variables are missing.

Table 6: Residual Diagnostic test

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.506120	Prob. F(6,23)	0.7973
Obs*R-squared	3.498969	Prob. Chi-Square(6)	0.7441
Scaled explained SS	3.894233	Prob. Chi-Square(6)	0.6910

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 09/26/24   Time: 14:16
Sample: 1993 2022
Included observations: 30

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.048782	0.415976	-0.117270	0.9077
BACAR	0.036600	0.098853	0.370245	0.7146
BLOAN	0.036635	0.218672	0.167535	0.8684
BAQUA	-0.007016	0.062873	-0.111596	0.9121
BADEP	0.023406	0.018994	1.232273	0.2303
BDERA	-0.050858	0.106029	-0.479667	0.6360
BISPE	-0.005282	0.006427	-0.821953	0.4195
R-squared	0.116632	Mean dependent var		0.048470
Adjusted R-squared	-0.113811	S.D. dependent var		0.095937
S.E. of regression	0.101249	Akaike info criterion		-1.541508
Sum squared resid	0.235780	Schwarz criterion		-1.214562
Log likelihood	30.12262	Hannan-Quinn criter.		-1.436915
F-statistic	0.506120	Durbin-Watson stat		1.469231
Prob(F-statistic)	0.797322			

Source: E- Views, 2024

Table 7: Summary Of Unit Root Test

Variables	T-Statistics	Order of Intergration	Probability	Decision
BANIM	-1.830373	1(0)	0.3590	Non-Stationary
BACAR	-4.449440	1(0)	0.0015	Stationary
BLOAN	-3.052776	1(0)	0.0417	Stationary
BAQUA	-2.989853	1(0)	0.0083	Stationary
BADEP	-1.898453	1(0)	0.3282	Non-Stationary
BDERA	-2.412466	1(0)	0.1472	Non-Stationary
BISPE	-3.676773	1(0)	0.0101	Stationary
		@ First Difference		
BANIM	-5.478237	1(1)	0.0001	Stationary
BACAR	-5.541137	1(1)	0.0001	Stationary
BLOAN	-4.747850	1(1)	0.0007	Stationary
BAQUA	-2.989853	1(1)	0.0083	Stationary
BADEP	-3.804008	1(1)	0.0076	Stationary
BDERA	-5.143475	1(1)	0.0003	Stationary
BISPE	-5.397332	1(1)	0.0002	Stationary

Source: E- Views, 2024

Residual Diagnostic Test (Breusch-Pagan-Godfrey Heteroskedasticity Test) in Table 6 checks for heteroskedasticity (non-constant variance of the residuals). Although, model's residuals are homoscedastic,

when the error variance is constant. F-statistic: 0.506 (p-value = 0.797) suggest no heteroskedasticity; hence, the errors have constant variance. This result is important for the validity of OLS estimators.

Table 7 tests for stationarity of the variables using the Augmented Dickey-Fuller (ADF) test. At level I(0), some variables are non-stationary (BANIM, BADEP, and BDERA), while others are stationary (BACAR, BLOAN). After differencing I(1), all variables become stationary (p-values < 0.05). This confirms mixed order integration in the dataset, which necessitates cointegration analysis.

Table 8: Johansen Cointegration Test
Date: 09/26/24   Time: 14:39
Sample (adjusted): 1995 2022
Included observations: 28 after adjustments
Trend assumption: Linear deterministic trend
Series: BANIM BACAR BLOAN BAQUA BADEP BDERA BISPE
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.803068	167.3162	125.6154	0.0000
At most 1 *	0.789802	121.8190	95.75366	0.0003
At most 2 *	0.736486	78.14723	69.81889	0.0093
At most 3	0.504649	40.80509	47.85613	0.1950
At most 4	0.319024	21.13538	29.79707	0.3493
At most 5	0.309491	10.37699	15.49471	0.2528
At most 6	0.000281	0.007874	3.841466	0.9288

Note: Trace test indicates 3 cointegrating eqn(s) at the 0.05 level
* Denotes rejection of the hypothesis at the 0.05 level, **MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None	0.803068	45.49718	46.23142	0.0598
At most 1 *	0.789802	43.67177	40.07757	0.0189
At most 2 *	0.736486	37.34214	33.87687	0.0185
At most 3	0.504649	19.66971	27.58434	0.3644
At most 4	0.319024	10.75839	21.13162	0.6714
At most 5	0.309491	10.36912	14.26460	0.1888
At most 6	0.000281	0.007874	3.841466	0.9288

Note: Max-eigenvalue test indicates no cointegration at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level, **MacKinnon-Haug-Michelis (1999) p-values
Unrestricted Cointegrating Coefficients (normalized by b'*S11*b=I):
Source: E- Views, 2024.

Table 8, checks for longstanding balance contacts amid the variables. The Trace test and Max-Eigenvalue test suggest 3 cointegrating equations at the 0.05 level. This indicates a long-term relationship between BANIM and BACAR, BLOAN, BAQUA, BADEP, BDERA and BISPE.

Table 9: Regression Analysis
Dependent Variable: BANIM
Method: Least Squares
Date: 09/26/24   Time: 14:12
Sample: 1993 2022
Included observations: 30

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-3.519320	1.033026	-3.406807	0.0024
BACAR	1.044564	0.245491	4.255002	0.0003
BLOAN	1.350655	0.543046	2.487186	0.0206
BAQUA	0.437614	0.156137	2.802754	0.0101
BADEP	-0.051259	0.047170	-1.086699	0.2884
BDERA	0.562099	0.263309	2.134748	0.0437
BISPE	-0.026396	0.015960	-1.653874	0.1117
R-squared	0.628838	Mean dependent var		1.035830
Adjusted R-squared	0.532013	S.D. dependent var		0.367550
S.E. of regression	0.251439	Akaike info criterion		0.277734
Sum squared resid	1.454101	Schwarz criterion		0.604680
Log likelihood	2.833992	Hannan-Quinn criter.		0.382327
F-statistic	6.494587	Durbin-Watson stat		0.935534
Prob(F-statistic)	0.000411			

Source: E- Views, 2024

Discussion

Bank Capital Ratio (BACAR) has a strong and statistically significant positive impact on the bank's net interest margin. A higher capital ratio contributes to improving profitability by enhancing the bank's ability to manage risks and generate returns. Sequel to the coefficients, it is evident that the banks were able to attract fund for activities at low cost at such it impacted the efficiency in a positive way. This outcome agrees with Jadah et al (2020); Chortareas et al. (2022) contrary to Yusuf et al. (2021); Obasan and Ojapinwa (2021).

Bank Loans (BLOAN) also significantly and positively affect the net interest margin, indicating that a higher volume of loans contributes to increased profitability. The coefficients suggest better asset-liability management which lead to generation of higher profits among the banks. The result agrees with Temitope and Olabisi (2022); Chioma and Adebayo (2022); Koroleva et al. (2021) contrary to Gwachha (2019). Asset Quality (BAQUA) is found to positively impact the net interest margin, suggesting that better management of asset quality and reduced exposure to non-performing assets contribute to higher profitability. The coefficients shows that the level of loan that are non performing among the banks are low at such led to positive outcome. The outcome is in line with Funmilayo and Akinola (2023); Adebayo and Olufemi (2023) contrary to Abiodun and Amori (2019); Adeolu and Amoo (2023).

Bank Deposits (BADEP) do not have a statistically significant effect on net interest margin in this study, indicating that the variable does not play a major role in determining profitability under the given model. This goes to explain that during the period, the banks were unable to attract and maintain reasonable deposits for

profit. This outcome agrees to Yuan et al. (2022); Hassan et al. (2021); Cornett et al. (2021) contrary to Olalekan and Abiodun (2023); Tan and Floros (2020).

Bank Deposit Rate (BDERA) shows a statistically significant positive effect on the net interest margin, implying that offering competitive deposit rates can help banks attract deposits and improve their margins. This affirms the interest on deposits of the banks were reasonable enough to generate profit. This result differs from Ehiedu et al. (2022); Adusei and Elliott (2020) but agrees with Calomiris and Carlson (2020); Adusei and Elliott (2020). Bank Interest Spread (BISPE) does not have a statistically significant effect on net interest margin in this study, indicating that this variable does not play a major role in determining efficiency under the given model. The non significance of BISPE can be as a result of too little return after settling fixed interest. This finding contradicts Mateev (2023). Overall, the regression model explains 62.88% of the variability in the net interest margin (R-squared = 0.6288), and the model is statistically significant (p-value = 0.0004 for the F-statistic). The cointegration analysis suggests a long-run equilibrium relationship between the net interest margin and the independent variables. The model does not suffer from specification errors, heteroskedasticity, or multicollinearity, making the results robust.

Conclusion

The study demonstrated key bank performance indicators such as the capital ratio, loan volume, asset quality, and deposit rate significantly influence the bank's net interest margin. Higher capital adequacy and better management of loans and assets contribute positively to profitability. On the other hand, variables such as bank deposits and interest spread have an insignificant influence on the bank's margin. The study concludes that the variants of bank assets significantly influence net interest margin of banks in Nigeria. These findings suggest that banks can improve their profitability by focusing on capital adequacy, loan expansion, and asset quality management while maintaining competitive deposit rates. Based on the findings of this study, the following recommendations are: Banks should prioritize increasing their capital base to improve risk management and enhance profitability. Regulatory authorities should ensure that banks maintain adequate capital buffers. Banks should seek to increase their loan portfolios by exploring new credit markets and improving the creditworthiness of potential borrowers. This will positively influence net interest margins and profitability.

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Consent to participate: Consent of the authors were duly sorted

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