

**Asset Quality, Capital Adequacy and Financial Performance of Deposit Money Banks in
Nigeria**

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Certification

This is to certify that Lukman Ayodeji OSHO with matriculation number LCU/PG/001904 carried out this research work titled “**Asset Quality, Capital Adequacy and Financial Performance of Deposit Money Banks in Nigeria**” in the Department of Management and Accounting, Faculty of Management and Social Sciences, Lead City University, Ibadan, Oyo State, for the award of Doctor of Philosophy Degree (PhD) in Finance and this has not been previously submitted.

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Dedication

This research work is dedicated to Almighty God

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Abstract

The performance of a banking institution is largely driven by its ability to increase its customers' patronage, retain them and manage its assets and liabilities to enhance optimal returns. This can be done through banks maintaining adequate capital and quality assets for better performance. In Nigeria, in spite of the fact that banks are highly regulated since 1988, many banks have failed due to insufficiency of capital and mismanagement of funds. Assets quality of deposit money banks and capital adequacy over time has been compromised. Increase in the level of gross non-performing loans pose a great risk to banks, the financial sector and the economy at large. Equally, failure to manage down non-performing loans over a long period gradually affects financial performance of deposit money banks. Non-performing loan profile in the DMBs in Nigeria is rising, and has been identified as a disturbing trend. It is thus imperative to ascertain the effect of capital adequacy in the financial performance of Deposit Money Banks (DMBs) in Nigeria. This study employed ordinary least square regression analysis with emphasis on pooled effect, fixed effect and random effect model. The findings of this research revealed that non-performing loans has a negative non-significant effect on financial performance of DMBs in Nigeria having a coefficient $\beta = -0.022478$ and P value of 0.5462. Loan loss provisions has a negative significant effect on financial performance of DMBs in Nigeria having a coefficient $\beta = -0.002954$ and P value of 0.0054. Risk weighted assets has a positive significant effect on financial performance of DMBs in Nigeria having a coefficient $\beta = 0.067768$ and P value of 0.0034. Liquidity ratio having a coefficient $\beta = 0.000435$ P value of 0.0034 has a positive significant effect on financial performance of DMBs in Nigeria. Moderating variable bank size (BS) has a negative non-significant effect on the effect of non-performing loans, loan loss provisions, risk weighted assets and liquidity ratio on the financial performance of deposit money banks in Nigeria. The study concluded that asset quality and capital adequacy are key factors affecting the financial performance of the Nigeria Deposit money banks and are essential in measuring financial performance of financial institutions while size has no effect on financial performance of the Nigeria Deposit money banks. The study, therefore, recommended that banks should put in place rigorous credit risk management policies in order to stem the increase in NPLs associated with increased lending. The CBN should ensure compliance by adequately monitoring compliance to policy on loan loss limits in relation to provisions. Central Bank of Nigeria should effectively regulate the capital and the resources owned by the Deposit Money Banks (DMBs) in Nigeria by ensuring that a certain level of capital is kept with the Central Bank for financial soundness and stability. Bank officials should be trained in the areas of liquidity management and liquidity changing conditions should not be handled with levity. The banks should reduce their non-performing loans by appropriate credit policies and procedures and should consider other quantitative and qualitative approaches of profit improvement than bank size.

Keywords: Assets Quality, Capital Adequacy, Bank size, Financial Performance, Return on Assets

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List of Acronyms

Abbreviation	Meaning
AQ	Assets Quality
BS	Bank Size
CA	Capital Adequacy
CAR	Capital Adequacy Ratio
CBN	Central Bank of Nigeria
FINDEV	Financial Development
FP	Financial Performance
IMF	International Monetary Fund
INF	Inflation
LLP	Loan Loss Provisions
LQR	Liquidity Ratio
NPL	Non Performing Loans
RWA	Risk Weighted Assets
ROA	Return on Assets
ROCE	Return on Capital Employed
ROE	Return on Equity

Chapter One

Introduction

1.1 Background to the Study

In any economy, the banking sector serves as a catalyst for expansion and improvement. These roles are generally achieved by banks thanks to their crucial responsibilities in financial intermediation, the development of reliable payment services, and facilitating the application of monetary policy. Banks engage in intermediation when they channel deposits from surplus economic units to deficit economic units, primarily businesses, in order to increase their productive potential for economic growth and development. When operating the payment system, each banking institution acts as a means of exchange. During their implementation, banks serve as the means by which the nation's monetary policies are carried out¹. Researchers, academics, bank management, stockholders, and regulatory organizations are all very interested in learning what factors affect the performance of a business, considering the significance of a bank's economic success².

Financial performance of banks gives a sign to depositors or investors to choose whether to put in or remove their capital from bank. Depositors need the prior financial analysis (if beneficial) to put in extra money to make profits. Regulators are expected to be concerned in understanding the financial performance to regulate accurately. The government may choose to improve the quality of banks or not. The examination of financial performance aids to identify where to put funds with more assurance. Financial performance of the bank as regards revenue and return mirrors its ability to assist current and prospective operations³. Similar to other businesses, the success of banking is determined by its financial performance, profitability, and asset quality⁴.

The ability of a banking organization to attract more customers, keep them as clients, and manage its assets and liabilities to maximize returns all contribute significantly to the firm's performance. Banks carry out all responsibilities engaged in the efficient and secure channeling of funds and serve as a bridge between owners and the users of funds. The effectiveness of deposit money banks (DMBs), outside of their roles in intermediation, has significant consequences for economic expansion. The interested party is rewarded for their contribution and is reassured to make additional investments by the DMBs' sound financial performance. On the other hand, poor performance might cause bank collapse and failure, which can hamper the economic development of the country⁵.

Financial performance analysis of deposit money banks has been of great interest to academic research. The banks' performance is the main goal of any bank to consistently increase the equity value and provide good quality of services to customers where "a good economic environment for financial institutions fosters an increase in profitability". It is essential for bank management not only to exploit its strength and opportunities, but also to tackle weakness and threats to ensure the success of a bank which is defined as how well a bank makes profits over a financial period⁶.

An organization's financial performance shows how effectively it uses its resources and how profitable it is. Customers, creditors, shareholders, the government, and top management have a considerable amount of interest in it because it demonstrates to shareholders this same return on investment invested; articulates to customers the institution's current needs; illustrates to the government the company's ability to pay tax bills; and proves to managers the benefit of their time and human capital invested in the organization⁷. In addition to their function as intermediaries, banks' financial health has a significant impact on a country's ability to grow its economy. Given

that financial development has played a significant role in economic advancement over the past few decades and has gained a prominent position within it, there has been debate over the significance of this development and its role in the intermediation of finance. Numerous academics have argued that financial development significantly spurs economic growth by encouraging industries, investments, the distribution of loanable funds, and capital accumulation⁸.

Both the microeconomic and macroeconomic levels can be utilized to analyze the relevance of bank performance. At the microeconomic level, the result is essential for the competition and serves as a funding source. At the macroeconomic level, a healthy and successful banking industry can withstand negative shocks and strengthen the banking and financial system. When ploughed in the company, a bank's profit is a crucial source of capital. Healthy banks would result from this, which promotes financial stability⁹. The level of capital adequacy, liquidity, bank size, expense management, provisioning policy, and other institutional factors like financial sector development, market concentration, ownership, and other macroeconomic factors are all factors that affect a bank's performance internally and externally, respectively¹⁰.

There have been arguments made in line with the idea that, apart from capital adequacy, other factors that enhance a bank's financial performance include size, asset quality, operating efficiency, and other macroeconomic factors^{11,12, 13}. In addition to capital adequacy, there are several other important factors that, when combined, would ensure a robust banking sector^{14, 15}. It was contended that indicators or measures of a bank's economic condition and performance should be based on variables such as capital adequacy, bank size, asset quality, managerial ability, liquidity, and the profitability of the bank in relation to the economy¹⁴.

The sustainability of a bank is heavily influenced by its assets, which also include liquid assets, fixed assets, a loan portfolio, and other investments like real estate. The size of a bank's assets increases with age¹⁶. Asset quality is a portion of bank management that comprises assessing a company's assets to make it easier to gauge the degree and scope of credit risk attached to its operations. It refers to the left side of a bank's balance sheet and concentrates on the loan quality, which generates income for the institution. The phrases "asset quality" and "loan quality" have essentially the same meanings, and supervision of both is critical to the banking industry. The most typical bank assets that are strictly used to assess asset quality are loans and advances. Increased loan quality boosts profits while also lowering the risk of failure at a tolerable cost¹⁷.

Loans from a bank typically produce a higher share of income from all of the bank's assets. As a result, banks that accept deposits generate more revenue through loans than from other categories of assets¹⁸. In contrast to other forms of businesses that produce and stock tangible goods, banks' primary duty is the management of assets and liabilities. All other kinds of businesses are run by money, which is how banks operate. As an outcome, without banks, other businesses might not function properly. Three main goals drive bank operations: profitability, asset development, and clientele.

Asset quality, also known as loan quality, is the total risk attached to the different assets owned by a person or organization. Bankers use it most frequently to calculate how most of their assets are financially at risk and how much provision for future losses they need to make. Loans, which can become non-performing assets if borrowers fail to meet their responsibilities to make payments, are the most frequent assets that need for a strict valuation of asset quality. Risk managers frequently evaluate the quality of assets by giving each item a numeric ranking built on the level

of risk involved¹⁹. Asset quality concept refers to the examination or evaluation that defines the credit risks related to any tangible resources that often demand the disbursement of interest, such as investment and loan portfolios.

The general risk connected to different assets owned by banking institutions is also said to maintain quality. Financial institutions frequently use it to calculate how many of their assets are financially at risk and how much allowance for possible losses they must make⁴. Cash advances and loans represent the most prevalent assets owned by banks that call for a thorough valuation of asset quality. In addition to increasing returns on financial institution loans and lowering failure costs, improving loan quality will also come at a cost that banks need to manage²⁰. When carrying out a research on banks, the backing of asset quality is a vital part and the primary concern. The type of credit rating given can also depend on how effectively and efficiently the bank management monitors and controls credit risk²¹.

Handling money involves a lot of risk and sensitivity. These dangers come from both small and large environments. Market risk, credit risk, default risk, interest rate risk, operational risk, and exchange rate risk are a few of these risks²². Asset quality is a key concern for banks; it refers to the estimation of a firm's assets for the purpose of determining the magnitude and scope of its credit risk. Asset quality, which primarily focuses on loan quality, is a tiny but extremely sensitive indicator that assesses the stability and profitability of commercial banks²³. As a result, a bank must exercise caution while making loans in order to preserve sound asset quality, as low asset quality implies bad financial performance on the part of the bank.

Any deposit bank's profitability is heavily influenced by the quality of its assets because it boosts interest earnings while simultaneously lowering the burden of managing bad debt costs. In order to protect themselves against bad debts and other loan failures, banks are required by law to set aside cash that is deductible as an expense²⁴. Asset quality is inversely correlated with the non-performing loan (NPL) ratio to gross/net asset. This reflects a poor trade-off between asset quality and the financial performance of the bank¹⁸. The extent of financial risk to which an asset is exposed and the allowance for prospective asset losses are both determined by the asset quality used by deposit money institutions.

Asset quality management is highly valued by the banking business, both domestically and internationally. The Central Bank Governors of the Group of Ten Countries have supported the Basel Committee on Banking Supervision's major publication, "Core Principles for Effective Banking Supervision," which was published in 1997 and presents a comprehensive list of twenty-five core principles. One-fourth of these are intended to address the pertinent problems with bank asset quality or credit risk management, indicating that asset quality is a global concern for financial regulatory authorities and that it might become a ticking time bomb for banks²⁵. The United States Federal Reserve Board established "Standards for Safety and Soundness" in 1995, which went into effect and mandated that U.S. financial institutions set up asset quality monitoring systems for spotting potential emerging issues with bank asset quality and require banks to routinely present asset quality reports to the Board of Directors in order to assess the risks associated with asset quality deterioration.

The soundness of the loan portfolio as well as the credit management program have the most impacts on a bank's overall status. The greatest risks that a company faces are those connected to

non-performing assets; hence, non-performing loan ratios (NPL) are recommended as proxies for asset quality²². Most banks work to keep the number of non-performing loans as low as possible because low non-performing loans indicate a bank's loan portfolio is in good shape¹⁷. Asset quality influences interest incomes while at the same time lowering the economic burden of managing bad debts in accordance with legal standards, making it a significant predictor of financial institution performance. To make sure they can absorb any losses that they may experience from bad loans, the banks are obligated to put aside cash, which is deductible as an expense. The trade-off between asset quality and financial performance is anticipated to be negative¹⁸, with a high NPL ratio to gross/net assets resulting in low asset quality and vice versa.

According to its functional definition, capital adequacy refers to the quantity of capital that is sufficient to carry out the primary capital functions of averting bank failures by absorbing exceptional losses. The best defense against bankruptcy and liquidation brought on by the risks involved in banking is sufficient capital. Adequate capital refers to a situation when the bank's adjusted capital is sufficient to cover all losses and its fixed assets generate enough surpluses to support both current and future growth. To retain public trust and to cover unexpected or unusual losses that cannot be covered by normal earnings, adequate capital is needed. To be able to draw in more money from the market and to restore depositors' and the public's trust in their capacity to fulfill their obligations, banks need to have enough capital²⁶.

For DMBs to operate effectively, adequate capital is required and crucial because it offers a safety net against failure²⁷. The most important questions are what kind and how much capital a bank needs to have enough protection²⁸. The portion of the bank's liabilities known as capital that does not need to be repaid is viewed as a safety net in the event that the value of the bank's assets

declines²⁹. Banks do not always turn a profit; thus, capital is necessary to act as a buffer when profits drop as a result of significant losses. However, if a bank's asset value falls below the sum of its obligations, the bank will become insolvent³⁰. It gives depositors confidence that their money is safe, the public confidence that the bank will be able to take into account their withdrawal and credit needs, and the regulatory authority confidence that the bank will continue to operate. Adequate capital gives customers, the public, and the regulatory authority confidence in the continued financial viability of the banks³¹.

Since banks deal with other people's money, it was explained that banks need to have adequate capital for the same reasons that other businesses do. Further emphasis was placed on the fact that the essential component of capital is the single component shared by the banking systems of all nations³². It is completely evident in published accounts since it serves as the foundation for market assessments of capital and has a significant impact on profit margins and banks' competitiveness³¹. In the banking industry of an economy, capital is crucial. Therefore, it is crucial for banks in Nigeria as well as the rest of the world to have adequate capital³³.

By serving as a safety net when the value of the bank's assets declines, capital significantly reduces the likelihood of bank failures and losses to consumers. In order to eliminate moral hazards and maintain competitiveness, capital sufficiency is essential. It also plays a significant role in minimizing various risk mechanisms in the banking industry. Additionally, banks need to have enough capital to support their internal needs, growth, and depositor security. The probable economic conditions of the overall economy also have an impact on capital adequacy²⁹. Measures of capital adequacy provide important information about a firm's returns, and some of the

individual variables for asset quality and profitability are also useful. Measures of loan exposure, size, and growth do not appear to have substantial explanatory power when returns are observed³⁴.

A banking industry with enough capital inspires confidence. It ensures the bank's financial viability to the general public, clients, and regulatory bodies. Together with borrowings and deposits, capital serves as the bank's primary source of funding. During the period of tight money, an undercapitalized bank will find itself exposed to high levels of short-term borrowing at potentially high excess costs³⁵. Macroeconomic factors affect bank returns, indicating that macroeconomic policies that support low inflation and steady output growth promote credit expansion³⁶. Because capital has an impact on lending and the effectiveness of banks as financial intermediaries, banks must have enough capital to distribute real wealth throughout the economy. Despite this, banks with high capitalization make more money than those with low capitalization¹⁸. Highly capitalized banks are less likely to experience insolvency and require less outside funding, especially in developing economies where it is difficult to obtain external borrowing³⁷.

The Bank for International Settlements (BIS) established the Basel I Accord, a historical document that set the standards for bank capital for all banks worldwide, in 1988 after realizing the significance of capital adequacy on bank performance and the need for a comprehensive standard on bank capital to improve the soundness of the banking sector. Over 120 nations around the world approved and adopted this³⁹. The Accord defined the minimum amount of capital that a bank must maintain as well as the standard for evaluating the ideal quantity of a bank's capital. The Basel I Accord was then replaced by the Basel II Accord, which has been in effect since 2006.

The Basel II Accord enhances techniques of risk assessment while maintaining the 8% minimum capital requirement³⁹.

Basel II is the second of the Basel Accords, which are recommendations on banking laws and regulations issued by the Basel Committee on Banking Supervision. It is now extended and partially superseded by Basel III. The Basel II Accord was published in June 2004. It was a new framework for international banking standards, superseding the Basel I framework, to determine the minimum capital that banks should hold to guard against the financial and operational risks. The regulations aimed to ensure that the more significant the risk a bank is exposed to, the greater the amount of capital the bank needs to hold to safeguard its solvency and overall economic stability. Basel II was implemented in 2008 in most major economies. Basel II attempted to accomplish this by establishing risk and capital management requirements to ensure that a bank has adequate capital for the risk the bank exposes itself to through its lending, investment and trading activities. One focus was to maintain sufficient consistency of regulations so to limit competitive inequality amongst internationally active banks³⁸.

Basel III is the third Basel Accord, a framework that sets international standards for bank capital adequacy, stress testing, and liquidity requirements. Augmenting and superseding parts of the Basel II standards, it was developed in response to the deficiencies in financial regulation revealed by the financial crisis of 2007–08. It is intended to strengthen bank capital requirements by increasing minimum capital requirements, holdings of high quality liquid assets, and decreasing bank leverage. Basel III was published by the Basel Committee on Banking Supervision in November 2010, and was scheduled to be introduced from 2013 until 2015; however, implementation was extended repeatedly to 1 January 2022 and then again until 1 January 2023,

in the wake of the COVID-19 pandemic. Basel III aims to strengthen the requirements in the Basel II regulatory standards for banks. In addition to increasing capital requirements, it introduces requirements on liquid asset holdings and funding stability, thereby seeking to mitigate the risk of a run on the bank³⁸.

The significance of bank managerial effectiveness and efficiency was underscored by the worldwide financial crisis of 2007–2009. Regulation and supervision of banks are seen as being very important due to the banking sector's enormous impact on the economy⁴⁰. Because regulators and supervisors have been concentrating on the issues of risk measurement and capital adequacy for more than two decades, these pervasive failures to keep appropriate capital and conduct effective risk governance are all the more astounding. The Basel Committee claims that it has been aiming for risk-based capital while establishing its minimum requirements for capital. Despite widespread agreement that risk-based capital was the key idea on which prudential regulation of capital should be focused, it is obvious that bank risk managers and supervisors failed to accurately estimate risk and to require capital commensurate with that risk.⁴¹

The current trend in Nigeria's banking and financing industry indicates that the era of low-cost profits is now over, and the only institutions that will survive the ensuing competition are those with carefully thought-out lending and credit administration policies and processes. All the aforementioned claims imply that banking practices are now severely in danger, which discourages saving behavior and lowers the amount of money that banks can raise. As a result, the profitability of the banks has suffered, which is thought to be a crucial indicator of a company's financial performance⁴².

Like its counterparts all over the world, the Nigerian banking sector has been heavily regulated so as to attain soundness and stability. The Nigerian Central Bank (CBN) and the Nigerian Deposit Insurance Corporation (NDIC) have also been given the authority to effectively supervise the banking industry and address any problems that may arise. The Basel II Accord, which has been in use globally since 2006, and the Basel I Accord, which went into effect in 1988, were both recognized by the CBN and put into practice. Despite this, the CBN was forced to cut the number of banks from 89 to 25 in 2004 and declare five banks insolvent in 2009 due to, among other things, capital adequacy violations⁴³.

1.2 Statement of the Problem

In Nigeria, the Banks and Other Financial Institutions Act (BOFIA) 1990, as amended, regulates bank operations and limits bank lending to prevent the problem of non-performing loans and guarantee asset quality. For example, Section 18 prohibits any personal interest in any loans and advances of bank staff without a declaration of the nature of the interest, and Section 20 limits loans and advances to the rate of 20% of the shareholder fund to a single obligor. The clauses of BASEL I, II, and III add to this. The misalignment of assets and liabilities has historically presented problems for Nigerian banks. The poor quality of assets has been cited as a contributing factor in past banking sector crises. The Assets Management Cooperation of Nigeria was established after the Central Bank of Nigeria's examination team found that four years after the consolidation, Nigerian deposit money banks had non-performing loans that were greater than their capital bases. This discovery prompted the Central Bank of Nigeria to inject N620 billion into the banking industry⁴⁴.

An increase in the level of gross non-performing loans between 2012 and 2017 poses a great risk to banks, the financial sector, and the economy at large. Equally, failure to manage non-performing loans over this long period gradually affects the financial performance of deposit money banks⁴⁵. Consequently, non-performing loans normally result in high loan loss provisioning, which leads to drop-in profits for many banks and gradually minimizes the bank sector's ability to play a role in the development of the economy⁴⁶. The non-performing loan profile in the DMBs in Nigeria is rising, and this has been identified as a disturbing trend. The increasing portfolio of non-performing loans led to the introduction of prudential guidelines by the Central Bank of Nigeria (CBN) in 2010. These guidelines by the apex bank in Nigeria mandated DMBs to continually review their loan portfolios from time to time. This should be done at least once every three months to enable DMBs to spot any adverse risk in the loan portfolio⁴⁷.

Despite the CBN's prudential guidelines, the level of non-performing loans continues to rise. For instance, in 2012, the Nigeria Deposit Insurance Corporation (NDIC) reported that non-performing loans totaled 286.09 billion naira, while in 2013, they increased to 321.66 billion naira, representing an increase of 12.43% (Nigeria Deposit Insurance Corporation, 2013). In addition, the International Monetary Fund Report for Nigeria also reported an increase from 5% to 15.6% of non-performing loans in relation to total loans between June 2015 and October 2017⁴⁸. This development, apart from its negative impact on credit intermediation and the ability of the banking sector to support growth, also impairs banking performance since interest on loans, which is the mainstay of banking income, is lost. Recently, Nigerian non-performing loans were reported at 3.315 USD billion. In March 2021. This represents an increase from the previous number of 3.251 USD billion for 2020. Nigerian non-performing loans data is updated quarterly, averaging

3.463 USD billion from March 2007 to March 2021⁴⁹. The financial stability report by the CBN (Central Bank of Nigeria, 2017) documented that CAR came down by 3.3% for the period covering December 2016 to June 2017. Furthermore, the magnitude of risky assets in relation to first-tier capital stood at 16.3% in December 2016, while it came down to 12.4% in June 2017, representing a decline of 3.9%.

Following persistent macro-economic challenges, 10 leading banks in Nigeria reported N811.7 billion in non-performing loans (NPL) by value out of the N21.87 trillion in gross loans granted to customers and other financial institutions in 2022. An investigation revealed that 10 banks in 2021 reported N724.45 billion in NPL, or about N18.36 trillion of their gross loans to customers and other financial institutions. The banks are: Access Holdings Plc., Zenith Bank Plc., Guaranty Trust Holding Company Plc. (GTCCO), and United Bank for Africa (UBA), all Tier-1 banks in Nigeria. Others include: Fidelity Bank Plc., Wema Bank Plc., FCMB Group Plc., Union Bank of Nigeria Plc., Stanbic IBTC Holdings Plc., and Sterling Bank Plc⁵⁰.

Banks in Nigeria have remained substantially fragmented, with significant gaps in the funding of economic operations for private agencies, despite the numerous reforms the country's banking system has undergone. Their liquidity situation, deposits and loans, loan loss provision, capital adequacy levels, and large interest spread are a few examples of how this is demonstrated. This indicates that, in terms of the strategic function of banks as enablers of savings, investment, employment, and the lifeblood of economic growth, the changes did not provide the desired results. Additionally, the banking system's degree of financial performance is typically viewed as poor and does not match the success of several financial sectors in growing economies like South Africa, Malaysia, Singapore, and the United Arab Emirates. Given these, it is essential to

empirically evaluate, using a variety of measures, the effect of asset quality and capital adequacy on the financial performance of the DMBs quoted in Nigeria.

1.3 Aim and Objectives of the Study

The main objective of this study is to investigate the effect of asset quality and capital adequacy on the financial performance of DMBs in Nigeria.

The specific objectives are to:

- i) examine the effect of non-performing loans on the return on assets of deposit money banks in Nigeria;
- ii) determine the effect of loans loss provision on the return on assets of deposit money banks in Nigeria;
- iii) examine the effect of risk weighted capital on the return on assets of deposit money banks in Nigeria;
- iv) examine the effect of liquidity ratio on the return on assets of deposit money banks in Nigeria;
- v) measure the moderating effect of bank size on the effect of non-performing loans, loans loss provision, risk weighted capital and liquidity ratio on return on assets of deposit money banks in Nigeria.

1.4 Research Questions

In the course of this study, answers are provided for the following:

- 1 how does non-performing loans affects return on assets of deposit money banks in Nigeria?
- 2 in what way does a loan loss provision affects return on assets of deposit money banks in Nigeria?
- 3 in what way does risk weighted capital affects return on assets of deposit money banks in Nigeria?
- 4 how does liquidity ratio affects return on assets of deposit money banks in Nigeria?
- 5 what are the moderating effects of bank size on the effect of non-performing loans, loans loss provision, risk weighted capital and liquidity ratio on return on assets of deposit money banks in Nigeria?

1.5 Hypotheses

Hypotheses for the research are stated in the null form as follows:

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

H₀₂: Loans Loss Provision has no significant effect on return on assets of deposit money banks in Nigeria

H₀₃: Risk weighted capital has no significant effect on return on assets of deposit money banks in Nigeria

H₀₄: Liquidity ratio has no significant effect on return on assets of deposit money banks in Nigeria.

H₀₅: Bank Size has not significantly influence the effect of non-performing loans, loans loss provision, risk weighted capital and liquidity ratio on return on assets of deposit money banks in Nigeria.

1.6 Scope of the Study

This study focused on the effect of asset quality and capital adequacy on the financial performance of deposit money banks (DMBs) quoted in Nigeria between 2012 and 2021. This period was chosen based on the increase in non-performing loan losses and the reduction in the capital adequacy ratio of deposit money banks between 2012 and 2021. To achieve the objectives of the study, the focus was strictly on DMBs quoted in the country. Thus, non-financial firms and non-banking financial institutions were excluded from this study. This study covers only the listed deposit money banks on the Nigeria Exchange Group (NEG), whose annual reports are available, and covers the period under study.

1.7 Significance of the Study

This research would deepen extant literature on the effect of asset quality, capital adequacy on bank performance. It will thus be of huge advantage to students of finance and other related courses of study. Besides, researchers in academics, research institutes as well as government institutions using research as critical inputs would also find this study a good research source. It will also contribute to the body of knowledge in the area of deposit money banks assets quality management. It will reconcile theory to reality while its findings will be used for further studies in the field in future. This will benefit the scholars and researchers in the field of credit and finance.

The research is important to the government in determination and establishing a stronger regulatory and legal framework for the Banking industry in Nigeria. The study is useful to the

government in policymaking regarding the deposit money banks assets quality management which will result to further protecting the depositors' funds while enhancing the deposit money banks financial performance and stability. Policymakers would find the holistic approach of this study useful in their pursuit of effective and efficient bank rules and supervision in the country. They would be able to appreciate the infusion of real sector variables and financial development indicators in the banking sector dynamics.

Moreover, this research would provide bank managers and other professionals a comprehensive and more realistic view of the simultaneous effects of capital adequacy, asset quality, bank size, inflation, foreign exchange and financial development on financial performance of deposit money banks quoted in Nigeria. This will ensure that they also pay serious attention to macroeconomic risk without sacrificing bank specific factors in maximizing value of the firm. The outcome of the research will enable the bank managers formulate strategies to enhance better management of their loans / assets portfolio in accordance with their growth strategies thereby maintaining high quality of their assets and realize their firm's maximization of wealth goals.

The shareholders of deposit money banks and would be investors would equally find this study of tremendous benefit as they seek to maximize shareholders' value and optimize return on their investments. They will get a clearer picture of the dynamics of bank performance and this would give them proper and more realistic perception of banks and their investments in them.

1.8 Limitation of the Study

The findings of the current study are applicable only to all thirteen quoted DMBs in Nigeria whose financial statements are available to the NEG as at the time of this research work which are considered for the purpose of this study and therefore it is hard to generalize these findings to all

financial institutions including microfinance banks and other specialized banks. Although all financial institutions carry out quite similar roles in the industry, the study only looked at deposit money banks in Nigeria for the ten year period. Therefore a similar study can be done for other financial institutions for comparison.

The dynamism of the variables used in this study was in relation to business cycle as well as demand on market. Therefore, the results might not be true on testing the real effect of the variables that deal with performance of deposit money banks putting into consideration of limited time. The demand and business cycle of the market is subject to changes and different banks are affected differently by the changes. Therefore, more determinants of financial performance should be included as explanatory variable in further studies for comparison.

1.9 Operational Definition of Terms

Assets: This is a resource with financial value that an individual, corporation or country own or control with the expectation that it will provide a future benefit.

Asset Quality: The aggregate risk related with the numerous assets held by an individual or institution is known as asset quality. The asset quality rating reflects the quantity of existing and potential credit risk associated with the loan and investment portfolios, other real estate owned, and other assets, as well as off-balance sheet transactions.

Bank size: The total assets determine the size of a bank. Bank size is measured as the natural logarithm of the value of total assets in Naira.

Capital: Any economic resource valued in terms of money that business owners and entrepreneurs use to pay for the materials they need to produce their goods or to offer their

services to the economic sector on which their operations are founded, i.e. retail, corporate, investment banking, etc.

Capital adequacy: Capital adequacy refers to the quantity of capital that is sufficient to carry out the primary functions of averting bank failures by absorbing exceptional loss. The statutory minimum reserves of capital which a bank or other financial institution must have available for its operation.

Financial Performance: Financial performance is the level of performance of a firm over a specific period of time and expressed in terms of the overall profits or losses incurred over the specific period under evaluation.

Liquidity: Liquidity refers to the ease with which an asset, or security, can be converted into ready cash without affecting its market price.

Liquidity ratio: The liquidity coverage ratio is the requirement whereby banks must hold an amount of high-quality liquid assets that's enough to fund cash outflows for 30 days.

Loan loss provision: A loan loss provision is the capital that a bank must set aside to cover changes in future expected losses on problem loans. It is a measure of capital risk, as well as asset quality of a bank

Non-performing loan: A non performing loan (NPL) is a sum of borrowed money whose scheduled payments have not been made by the debtor for a period of time—usually 90 or 180 days.

Risk-weighted assets: Risk-weighted assets (RWA) are used to link the minimum amount of capital that banks must have, with the risk profile of the bank's lending activities (and other assets). The more risk a bank is taking, the more capital is needed to protect depositors.

Return on Assets (ROA): This is the net income of a business after taxes to total asset ratio.

It is the best indicator used to measure earning of the business.

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Chapter Two

Literature Review

This chapter reviews existing literatures that are relevant to the asset quality, capital adequacy and financial performance. It explicates the conceptual framework that characterizes the contents of the study. It provides a discussion on the theories related to the study, empirical researches from the available literature on the topic under study are also presented in the chapter, as well as conceptual model of the study.

2.1 Conceptual Review

2.1.1.1 Financial Performance

Scholars in a diversity of business and strategic management fields have begun to pay close consideration to the issue of financial performance. Since financial performance has an impact on an organization's health and ultimately its survival, it has also seen to be the main focus of business professionals in all types of businesses. High performance demonstrates managerial competence and efficiency in utilizing firm resources, which in also helps the overall economy of the nation¹.

Financial performance is the strength of an organization's financial situation. Financial analysis is the course of correctly establishing the connections between the components of the statement of financial position and statement of income account so as to determine the firm's financial strengths and weaknesses. A ratio is mainly used as a benchmark in financial analysis to assess a company's financial situation and performance. Ratio is referred to as the connection between two

or more items and as the suggested quotient of two mathematical expressions. Ratios assist in both qualitatively assessing the firm's financial performance and summarizing vast amounts of financial data².

Since the aim of every organization is so closely related to its performance measurement, it becomes vital for business to understand what creates performance in an organization³. Performance is defined as accomplishing now what will produce outcomes with quantified worth tomorrow. Business performance is the course of delivering the most effective, advised, and accurate result of a firm's actions, hence performance measurement is concerned with assessing the performance and outcome of investment of a business over a specific period of time⁴.

While it is agreed that the current state of the global financial markets and the consequent prospects for global economic growth appear to be difficult, the deposit money institutions that are operating in a sound state will continue to be resilient. A measurement of the monetary outcomes of a company's policies and activities is referred to as financial performance. Both the income statement and the balance sheet are crucial documents in determining a company's overall financial health since they reflect the working success of the business and display its net worth, respectively⁵. The following essential metrics, which are crucial to evaluating the present financial situation and performance, can be used to evaluate financial performance. These financial position and performance indicators are descriptive and analytical in nature. Total assets, total liabilities, shareholders' equity, total revenues, total expenses, and net income are examples of descriptive metrics. Additionally, profitability, efficiency, liquidity, and solvency metrics may be considered as analytical measurements of financial condition and performance⁶.

Business performance measurement has long been built on financial metrics. These metrics provided a high level of information aggregation, expressed performance and accomplishment in monetary terms, and were listed in the chart of accounts. More significantly, financial measures adhere to generally accepted accounting principles and are widely recognized (GAAP). Because non-financial metrics like customer happiness, quality, market share, and human resources tend to take a backseat to financial results, they are nonetheless widely accepted to use by the majority of businesses. Additionally, managers' underlying reliance on financial performance indicators rules over organizational strategy, especially in the short term. The financial measurements have also been employed for many years, and managers are typically at ease using them⁶.

The key performance indicators are the criteria that a business uses to assess its own performance. No single indicator gives a full image of the company's success; rather they must be looked into so as to create a comprehensive overview. A company can define its goals and track its progress toward them with the aid of performance indicators, commonly referred to as success indicators. An organization requires a mechanism to gauge its success once it has examined its mission, listed all its stakeholders, and established its goals⁷.

Whatever main performance indicators are chosen, they must be quantifiable, reflect the objectives of the firm, and be essential to its success (measurable). Main performance indicators (MPI) are typically long-term factors. They do not frequently alter in terms of definition or measurement. The objectives for a certain MPI may alter as the organization's objectives change or when an objective is neared. Depending on the organization, they will vary. The percentage of revenue generated by repeat customers may be one of a company's critical performance metrics. Businesses need to create strategic goals, implement decisions, and evaluate their state and behavior as they approach their goal in order to survive and prosper⁷.

The use of a bank's resources in a way that enables it to accomplish its goals might be mirrored in the performance of the bank. Additionally, the word "bank performance" refers to the acceptance of a set of metrics that reflect the status of the organization and the degree of its capacity to meet established goals⁷. We assess the performance of banks for a variety of reasons, including assessing their operational outcomes and overall financial condition, as well as to gauge their asset quality, management quality, efficiency, and accomplishment of their goals as well as ascertain their earning quality, liquidity, capital adequacy and level of bank services⁸.

The determinants of bank performances can be classified into bank specific (internal) and macroeconomic (external) factors^{9,10}. Internal factors are unique qualities of the bank that have an impact on its performance. Internal actions made by management and the board have a significant effect on these variables⁹. The external factors are those that affect the performance of banks in general on a sectoral or national level and are out of the company's control. As previously stated, the internal factors are variables unique to banks that affect the financial performance of banks. These variables are subject to manipulation by the bank, and they vary from bank to bank. These include Asset Quality, Capital Adequacy, Liquidity, Management efficiency and Size of the bank¹⁰. Those factors which are outside the management control are referred to as external or macro-economic factors and these factors are related to the industry and economy as a whole. The external determinants are factors that have nothing to do with bank management but rather reflect the economic and legal environment that has an impact on how well financial institutions operate and perform. Inflation, foreign exchange rates, and financial development are just a few of the external factors that have a negligible effect on the profitability of banks¹⁰.

Financial Performance of the banking industry is a main subject that has received much attention in recent years. Several studies have evaluated the financial Performance of banks under various

operating parameters. Numerous studies that have concentrated on the American banking sector have shown that better resource management is the main factor influencing bank success and the banking systems in the Western and developed countries^{11,12,13,14,15,16,17}

When banks do well financially, depositors and investors know whether to put money into the bank or take it out. Prior financial research is required by depositors so as to make additional deposits and earn earnings (if beneficial). In order to accurately regulate, regulators should be interested about knowing financial performance. The government has the option of enhancing bank quality or not. Examining financial success makes it easier to decide where to invest money with greater security. The bank's financial performance in regards of revenue and return reflects its capacity to support ongoing and upcoming operations¹⁸.

The provision of effective banking services, increased savings mobilization, and the allocation of these funds between surplus and deficit units all contribute to improved banking performance. The idea of operational performance is this. Accordingly, operational efficiency is vital for determining how much it costs to operate in the market, together with pricing and allocation efficiency¹⁹. Financial performance is a different notion of performance from literary. Banking income serves as a gauge of financial performance in this regard and serves as the foundation for other performance metrics (rate of return, profits, net interest margin, return on equity etc.). Accounting and econometric methodologies can be used to measure the financial performance of banks in two different ways. The accounting method, which has historically been the main metrics used to gauge bank performance, uses straightforward financial ratios to appraise the profitability of businesses. In particular, ratio analysis has historically been used to examine the financial performance of banks, despite having a number of drawbacks²⁰.

It might be asserted as of the overhead that performance evaluation is an extent of achievement with proposed or likely target of an establishment. It may also be seen as the procedure or way whereby a company creates the parameters within which acquisitions, attainments, programmes, investments and outputs are realizing the expected results. From existing literature, the general performance measurements can be determined to measure the Nigerian banking sector's performance. The earnings are the central features as all other measurements of performance are assessed by the yields in form of their contribution to the total profitability of the banking business²⁰.

Accordingly, benchmarks like return on assets (ROA), return on equity (ROE), return on capital employed (ROCE), earning per share (EPS), net profit margin, gross income, and others have continued to appear in literature as substitutes for firm performance. Empirical studies on firm performance have traditionally focused on the profitability perspective of performance. Considering that businesses continue to have a profit-driven goal may help to explain this. Therefore, all other performance categories might only be important to the extent that they increase the company's profitability²¹. However, performance in the banking industry entails much more than financial success. A company's capacity to regularly produce net income is stated to as profitability. Ratios have shown to be useful in expressing business profitability. Ratios support the qualitative valuation of the firm's profitability and the summarization of massive amounts of financial data²¹.

Profitability ratios are used as indicators of financial performance in a number of research studies, with computations based on data from the target firms' annual reports²². Because the real worth of reported earnings is unaffected by shifting inflation rates, the application of profitability ratios is unaffected by changes in price levels. Return on Assets (ROA) and Return on Equity (ROE) are

indicators of a bank's financial health²³. The rate of return earned on shareholders' equity is measured by ROE. For banks, it can be calculated by dividing net income after taxes by the sum of Tier 1 and Tier 2 equity capital. An institution's return on equity (ROE) shows how much money its shareholders invested. Contrarily, ROA is just Net Income after Taxes divided by Total Assets. It is a sign of organizational performance since it demonstrates how successfully and efficiently a bank's management has used assets to produce income. High ROA is typically thought to be an indicator of an organization performing well²³. In this regard, ROA is a genuinely practical tool for comparing bank profitability and evaluating the performance of the overall banking system.

To gauge a bank's capacity to make profits from revenue and assets, a variety of profitability ratios can be utilized. The capacity of a bank is assessed using its net investment margin (NIM), return on assets (ROA), diversification ratio, net profit margin, earnings per share (EPS), and return on capital employed (ROCE)²⁴. NIM, ROA and ROE are the best frequently used ratios in measuring bank profitability in banking literature. Ratios are not affected by fluctuations in general price levels making them more appropriate to use than real values of profit when assessing bank profitability²⁵.

Return on assets (ROA) has been variously applied as the collective measures on banks' performance. Many regulators believe ROA is the best measure of bank profitability²⁶. Bank performance is best measured by ROA in that ROA is not vague by high equity multipliers and ROA stands as a better gauge of a company's ability to generate returns on its portfolio of assets²⁶. Moreover, using ROE may not be the best applicable measure because equity alone is insignificant when looking at it as regards percentage in shareholders' investment in bank. This has made ROA as the most typical metric employed to assess banks' performance²⁷. An

examination of the financial performance and management effectiveness of banks in Taiwan using ROA revealed a substantial correlation between profitability as assessed by ROA and financial performance of banks²⁸.

Growth and profitability are two distinct viewpoints on the financial performance of organizations that can each be operationalized using one or more indicators. For instance, return on equity (ROE), return on assets (ROA), or even return on investments (ROI) can be used to measure profitability, while sales growth can be applied to quantify growth²⁹. It is good to measure the profitability using ROA for the fact that high equity multiplier cannot be distorted by it³⁰. Similarly, to financial intermediaries end up having lower ROA, it is common for banks to use financial leverage to raise their ROE to levels that are comparable and competitive³¹. This is the case that this paper adopts ROA as the measure of banks' financial performance.

2.1.1.2 Return on Assets (ROA)

Return on assets (ROA) assesses how well an economy, particularly in manufacturing, uses its resources to make profits. The greater this ratio, the stronger the economy, as it shows how well management uses funds to generate profits. It also symbolizes the return on assets (ROA) ratio, which measures how much a company has made relation to the value of its assets³². Additionally, ROA has been employed as a dependent variable in a number of studies. Measuring ROA is a useful way to gauge the level of returns on investments made in the firms, the net profit in relation to the asset base of the selected firm. The dependent variable employed by different authors has been return on assets (ROA)^{33,34,35,36,37}.

ROA is a crucial number that reveals a bank's profitability. It measures the income to asset ratio at³⁸. It gauges the capacity of the bank management to generate income by utilizing company

assets at their disposal. Otherwise put, it shows how efficiently the resources of the business are used to generate the income. It also shows how good a company's management uses all of the institution's resources to produce net income³⁸. Additionally, it is noted that a higher ROA demonstrates the company's improved resource utilization³⁹.

Return on assets (ROA) is a measure of a company's profitability in relation to its overall assets. It provides a hint as to whether management of the organization has been effective in utilizing company assets to produce earnings. The best way to gauge a company's performance is through return on assets (ROA), and an increase in this ratio means that a related firm is performing financially well, and vice versa⁴⁰.

The Return on Assets (ROA), which is the ratio of net income after taxes to total assets, is the best metric for assessing earnings. The capacity of banks to continue their current and future operations is shown in their strong profits and profitability characteristics. More specifically, it establishes the capacity to withstand losses, pay off debts, provide dividends to shareholders, and accumulate enough capital. The importance of high earnings and profitability can almost ever be overstated because they come first in line of defense against the depletion of capital due to losses. Although many different measures are used to accomplish this, Return on Assets (ROA) is the most significant and often used indicator, according to opinionated⁴¹.

In the various work of researchers, return on assets (ROA), return on equity (ROE), and/or net interest margins are frequently used as indicators of bank profitability. Any bank's ROA is centered on its policy choices as well as immovable elements like the state of the economy and governmental laws. The best indicator of bank profitability, in the opinion of many regulators, is ROA²⁶. Return on assets displays the profitability of the company's assets after all costs and taxes

have been paid⁴¹. It serves as a general indicator of managerial effectiveness⁴². It calculates the return the company makes after taxes on each dollar it invests in its assets. In other words, it calculates the net earnings per unit of an asset and how the bank might turn its assets into profits⁴³. Generally, a higher ratio means better managerial performance and efficient use of the resources of the business and lower ratio is the indicator of inefficient use of assets. Firms can boost ROA either by growing profit margins or asset turnover but they can't do it concurrently because of competition and trade-off between turnover and margin.

A bank's net income can be used to gauge its performance, but it has one significant flaw. It does not account for the size of the bank, making it challenging to analyze how well one bank is performing in comparison to another. The return on assets (ROA) is a fundamental indicator of bank performance (profitability) that accounts for bank size. It is determined by dividing the bank's net income by the total value of its assets. In other words, total assets / earnings before taxes. Because it shows how effectively a bank's assets are being used to produce profits, ROA is a helpful indicator of a bank manager's performance⁴⁴. Manager often measure the effectiveness of a company by measuring its net income to total assets, otherwise referred to as Return on Asset. Although ROA provides useful information about bank profitability, for equity holders, it is not the most crucial issue⁴².

Return on assets (ROA) as always been used as a dependent variable. It is the quotient of dividing profit after tax by total assets⁴⁵. It is a proportion which seeks to point the amount of profit realized from the entire assets of the business. It is express as Profit before tax divided by Total Assets⁴⁶. Return on assets (ROA) is use in this research as dependent variable, because it is an indicator of managerial efficacy⁴⁷. The formula for return on Assets (ROA) is express as Profit before tax divided by Total Assets^{48,49,50,51}.

The financial ratio known as Return on Assets (ROA) measures a company's profitability. It measures the income relative to total assets. It gauges the corporate management's capacity to turn a profit by making use of the resources at their disposal. In other words, it demonstrates how effectively the company's resources are employed to produce revenue. It also shows how good a company's management uses all of the organization's resources to produce net income⁵². A greater ROA demonstrates the company's improved resource utilization⁵³.

It has been reported that market analysts frequently use Return on Assets (ROA) as a gauge of financial performance since it assesses how well assets generate revenue. Return on Assets (ROA) is one of the most popular accounting metrics for assessing financial performance. Consequently, return on assets (ROA) was utilized in this study as a gauge of financial performance.^{49,50,51,54,55}

Return on equity is one of the most crucial profitability metrics (ROE). Return on equity (ROE) measures a company's profitability in relation to the total shareholder equity reported on the balance sheet. A company with a high return on equity is more likely to be able to generate cash on its own. Generally speaking, a company's return on equity should be higher than average for its industry⁵⁶. The return on equity (ROE) ratio is one technique to gauge the profit enjoyed by shareholders because it can be utilized to contrast one company to another and can show how profitable one industry is compared to another⁵⁷.

A financial ratio called return on equity (ROE) measures a company's profitability in relation to the total amount of invested or shown on the balance sheet shareholder equity. The shareholders seek a return on equity (ROE) on their investment. A company that generates cash internally is more likely to have an excellent return on equity. Therefore, the corporation is more profitable the greater the ROE⁵⁸. Although ROA is a useful indicator of bank profitability, the bank's owners

(equity holders) are less concerned with it. They are more interested in the return on equity (ROE), or the net income per Naira of equity capital, which is a gauge of the amount of the bank is making on their equity investment.

Return on equity shows the profitability to shareholders of the firm after all expenses and taxes¹². It calculates the amount the firm is earning after tax for each dollar invested in the firm. In other words, ROE is net earnings per dollar equity capital. It is likewise an indicator of measuring managerial competence⁵⁹. By and large, higher ROE means better managerial performance; however, a higher return on equity may be owing to debt (financial leverage) or higher return on assets. Because financial leverage always expands ROE, it makes a significant distinction between ROA and ROE. As long as the ROA (gross) exceeds the interest rate on debt, this will always be the case⁶⁰. Usually, there is higher ROE for high growth companies.

Return on capital employed is another common metric for profit (ROCE). Although it is ideal, using the ROCE as a performance measure is false and has the potential to provide misleading data. Capital employed as stated in a company's balance sheet cannot be used to determine the true efficiency of the use of firm's resources. This is so because the capital employed on the balance sheet is a fixed measure for a certain date rather than for the full time. Therefore, the fixed character the value of the capital used as of that date would invariably have an impact on the outcome. As the capital used at the balance sheet date will always be responsible for producing an average rather than the total resources employed, such a metric will generate a larger-than-life result⁶¹.

A financial ratio called return on equity (ROE) measures a company's profitability in relation to the total amount of invested or shown on the balance sheet shareholder equity. The shareholders

seek a return on equity (ROE) on their investment. A company with a high return on equity is more likely to be able to generate cash on its own. Therefore, the corporation is better at generating profits the higher the ROE³⁸. The ROE ratio is calculated by dividing Net Income after Taxes by Total Equity Capital. It shows the rate of return on the money that bank stockholders invested there. ROE measures a bank's management's efficiency in allocating shareholders' money. The outcome it follows from the aforementioned statement that management will use shareholders' capital more effectively the higher the ROE⁵⁹.

The return on equity (ROE) ratio tells investors how well a bank's management team is using the money that shareholders have invested in it. To put it another way, it evaluates the bank's profitability in relation to shareholders' equity. The management of a firm is more effective at creating revenue and expansion from its equity funding when the ROE is higher⁶². ROE is frequently used to contrast a bank or business with its rivals and the market as a full. The formula is particularly useful when contrasting businesses operating in the same sector because it frequently provides reliable indicators of which institutions are conducting their operations with increased monetary effectiveness.

A financial ratio known as the return on equity (ROE) measures a company's profitability in relation to the total amount of invested or shown on the balance sheet shareholder equity. The shareholders seek a return on equity (ROE) on their investment. A company with a high return on equity is likely to generate cash on its own. Therefore, the company's ability to generate profits is stronger if its ROE is higher⁵². The ROE ratio is calculated by dividing Net Income after Taxes by Total Equity Capital. It shows the rate of return on the money that bank stockholders invested there. ROE measures a bank's management's efficiency in allocating shareholders' money.

Therefore, it follows from the aforementioned premise that management is more effective at using shareholders' capital the more the ROE⁵².

2.1.2.1 Asset Quality

The asset of the bank is a factor unique to banks that has an impact on their financial performance. Among other things, the bank asset comprises its credit portfolio, fixed assets, and other investments. A bank's age is frequently correlated with an increase in asset size. Most frequently, a bank's loan is its most valuable asset and accounts for the lion's share of its revenue. The primary asset from which deposit money banks derive their revenue is the loan. The profitability of banks is centered on the quality of their loan portfolio. Losses resulting from past-due loans provide the biggest risk to banks. The best indicators of asset quality are hence non-performing loan ratios. The goal of all deposit money banks is to maintain a low level of non-performing loans. This is true since a bank's earnings is affected by high non-performing loans⁶³.

The aggregate risk related with the numerous assets held by an individual or institution is known as asset quality or loan quality. Banks frequently use this phrase to assess how many of their holdings are at danger of loss and how much provision for any losses they need to make¹⁰. Loans and advances are the most frequent bank assets that call for a strict assessment of asset quality. The return on bank loans will increase and the costs connected with failure will decrease as loan quality rises, but doing so will come at a price that banks will need to manage⁶⁴.

Like all other businesses, the banking business is entitled to both assets and liabilities. However, according on the form and type of business authorized by statutory authorities in various countries, the composition of the assets and liabilities varies. The loans and advances, securities, and other investments kept for the purpose of earning and creating income by the bank make up the banks'

assets. The timeliness with which borrowers are fulfilling their contractual obligations is known as asset quality⁶⁵. The asset's quality must be sufficient in terms of the ratio of high-yielding to non-yielding assets, i.e., performing to non-performing or delinquent to impaired loans. A low cost/expense ratio combined with a high performing to nonperforming ratio is a requirement for the bank to operate efficiently overall. Ceteris paribus, this crucial feature unique to banks is crucial to their profitability and survival, which is why empirical scholars and practitioners are clamoring for more empirical research on this crucial aspect of banking efficiency.

Asset quality is a component of bank management that comprises assessing the firm's assets in order to make it easier to gauge the degree and scope of the credit risk attached to its operation. Micro prudential variables influencing the soundness and profitability of deposit money banks include asset quality. It pertains to the left side of a bank's balance sheet and is concentrated on the loan quality, which generates income for the bank⁶⁵. It is seven of the twenty-five fundamental ideas that the BASEL Committee on Banking Supervision identified as essential to effective bank supervision in 1997. Maintaining solid asset quality requires careful loan issuing that must be scrutinized and adherence to banking regulations. Poor asset quality has an impact on both the financial performance and the stability of the banking system as a micro determinant of profitability⁶⁵.

The asset quality, also known as loan quality, gauges how accurately a financial institution assesses and manages the credit risk of its assets⁶⁶. The ratio of total loans to non-performing loans is used to calculate it. One particular factor that influences a bank's profitability is its asset. Current asset, credit portfolio, fixed asset, and other investments are several examples of bank assets. a growing asset (size) that is frequently correlated with the bank's age¹⁶.

The bulk of time, a bank's loan is its most valuable asset and also the source of the lion's share of its revenue. The profitability of banks is determined by the standard of their loan portfolio. Bank profitability is directly impacted by the quality of the loan portfolio. Losses from past-due loans are the bank's biggest risk⁶⁷. The best indicators of asset quality are hence non-performing loan ratios. Different financial ratios are used by different academics to evaluate banks' operating results. The goal of all deposit money banks is to maintain a low level of non-performing loans. This is true since a bank's profitability is impacted by high nonperforming loans. Therefore, a low ratio of non-performing to total loans indicates that the bank's portfolio is in good shape⁶⁷.

The predominance of non-performing assets is a serious danger to the banking business (NPAs). NPA stands for "non-performing assets," or bad loans for which the borrowers weren't able to make their payments. Operational effectiveness has an impact on the profitability, liquidity, and solvency of banks due to the NPA in the loan portfolio¹⁰. Asset quality influences interest incomes while in the same manner lowering the economic burden of managing bad debts in accordance with legal standards, making it a significant predictor of financial institution performance. To ensure they can absorb any losses that they may incur from loan defaults, the banks are required to set aside cash, which is deductible as an expense. The trade-off amongst asset quality and financial performance is anticipated to be negative, with the high NPA ratio to the gross/net assets book indicating low asset quality and vice versa¹⁰.

A strange factor that influences a bank's performance is its asset. In addition to current assets, credit roles, fixed assets, and other investments, the bank asset is taken into account. Deposit money banks engage in asset and investment banking activities by offering loans to a range of customers in an effort to improve the performance and financial positions of the banks. According to reports, loans and advances make up a sizable portion of bank assets, and loan income is the

banks' main source of income⁶⁸. The primary asset that DMBs use to make money is a loan. The success of the loan function for banks is determined by its quality. The worth of the loan has a direct impact on bank success. Losses resulting from delinquent loans provide the maximum danger to banks⁶⁷.

Asset quality management is highly valued by the banking institutions both domestically and internationally. The "Core Principles for Effective Banking Supervision" statement, published by the Basle Committee on Banking Supervision in 1997, was significant because it presented a comprehensive set of twenty-five core principles and was endorsed by the Central Bank governors of various nations. One-fourth of them are intended to address pertinent problems with bank asset quality, indicating that asset quality is a worldwide priority for financial supervisory authorities⁶⁹.

From the standpoint of management accounting, bank asset quality and operating performance are strongly correlated, as a bank's insufficient asset quality will force it to incur more bad debt losses and devote more resources to the recovery of non-performing loans⁶⁶. To be able to manage and oversee the collection process, banks will incur additional operating costs from non-value-added activities when they list the loan amount for collection. Examples of these activities include regularly monitoring the debtor's financial situation, keeping an eye on the collateral value, rearranging the amortization schedule, paying costs related to contract negotiations, calculating the costs to withhold, etc. The costs includes gaining management and public trust, maintaining the security and completeness of the banks, preventing the banks from receiving a poor rating due to external events, reducing deposits caused by a loss of clients' trust, paying more to monitor loan quality, and paying more in the nearest future because of ignorance of issues from other operations that arise when the senior management becomes preoccupied with the loan quality issues⁶⁴.

The strength of financial organizations against asset value loss is determined by asset quality. The primary cause of banking issues, declining asset values, immediately affect other sectors as losses are finally written off against capital, revealing the institution's ability to generate long-term financial gain. In light of this, the asset quality is evaluated in relation to the quantity and severity of non-performing assets, the sufficiency of provisions, recoveries, and other factors. Popular measures include recoveries to loan default ratios, loan default to total advances ratios, and nonperforming loans to advances ratios⁷⁰.

Monitoring indicators for financial organizations' assets quality is crucial in terms of overexposure to particular risks, trends in non-performing loans, and the health and profitability of bank borrowers, especially the financial sector, as these factors can put financial institutions' solvency at risk. Additionally, since 1990, deposits as a percentage of all bank liabilities have decreased in many affluent nations, while public deposits continue to dominate the banking sector in developing nations. One of the primary hazards that banks confront is the ratio of assets to liabilities. Loans are the asset class with the biggest default risk, hence an increase in non-performing loans indicates a deterioration in asset quality⁷¹.

The International Monetary Fund's Global Financial Stability Report from 2009 states that the two of the three main tasks that directly relate to NPAs are identifying and managing distressed assets, recapitalizing weak but viable institutions, and resolving failed institutions. It should go without saying that higher asset quality contributes to increased profitability. Banks must manage both their asset quality and the factors that affect profitability in order to increase profitability. The prevalence of subpar bank assets necessitates a reexamination of the variables influencing banks' performance in terms of profitability and asset management⁷².

Bank failure is the direct result of the NPAs in the banking system starting to bubble up. Given this well-established fact, the topic of NPAs has recently attracted more interest. For the reason behind bank failures, asset quality is a statistically significant predictor of insolvency. Prior to failure, non-performing loans are almost always at a high level in failing banking organizations. The issue of NPAs has come to be associated with the functional effectiveness of financial intermediaries and is thought to be the main contributor to problems with economic stagnation⁷⁰. The Global Financial Stability Report lists two of the three key tasks that directly relate to NPAs as identifying and managing distressed assets, recapitalizing weak but viable institutions, and resolving failed institutions⁷¹. It is apparent that improved profitability is supported by better asset quality. Banks must therefore effectively manage their asset quality as well as other factors that affect profitability. Two of the three key reasons for a fresh look at the variables affecting banks' performance are the rising prevalence of poor bank asset quality and the need to resolve failed institutions.

In order to manage and oversee the collection process, banks will incur additional operating costs from non-value-added activities when they list the loan amount for collection. Examples of these activities include regularly monitoring the debtor's financial situation, keeping an eye on the collateral value, rearranging the amortization schedule, paying costs associated with contract negotiations, calculating the costs to withhold, etc. Gaining management and public trust, maintaining the safety and completeness of the banks, preventing the banks from being rated poorly as a result of external affairs, reducing deposits due to a loss of clients' faith, additional costs to monitor loan quality, and higher future costs caused by ignorance of the issues from other operations when the loan quality issues capture the attention of senior management are just a few of the costs⁶⁴.

According to the Central Bank of Nigeria (CBN), non-performing loans are those for which both the interest and/or principal payments are at least 90 days past due and the interest has been capitalized, rescheduled, or rolled over into a new loan at least twice. Sub-standard non-performing loans, questionable non-performing loans, and lost non-performing loans are further categories for non-performing facilities. A customer who exhibits any of the following: (a) insufficient cash flow to service the debt; (b) a lack of adequate financial information or collateral documentation; (c) undercapitalization or insufficient working capital; and (d) irregular principal and/or interest payment, is considered to have sub-standard non-performing facilities, where unpaid principal or interest remains outstanding for more than 90 days but less than 180 days⁶⁴.

The customer shows, in addition to the flaws associated with substandard loans, that full repayment of the debt is not certain or that the realisable collateral values will not be sufficient to cover the debt with doubtful non-performance facilities, which consist of unpaid principal and interest that remain outstanding for 180 days but less than 360 days and are not secured by legal title to leased assets or perfected realisable collateral in the course of collection or realisation. For this class of asset, a 50% provision is necessary⁶⁴.

Lost non-performing facilities are those for which the customer exhibits the weakness associated with doubtful credit facilities above, which are deemed uncollectible and are of such little value that continuation as bankable assets are unrealistic, and which are not secured by legal title to leased assets or perfected realized collections. Non-performing loans fall under the category of losses and bad debts, which calls for 100% capital cover⁶⁴.

The performance of banks is directly impacted by asset management, according to a large body of empirical research. The bank's risk management system will have a significant impact on the

quality of the bank's assets, notably its loan and investment portfolio. Loan assets would be measured in terms of their realizable worth as collateral, and investment assets would be measured in terms of their market value. The best method for determining the asset quality of banks is to use the ratio of non-performing assets (loans) to total loans and advances. The amount of non-performing assets directly affects the bank's profitability; for example, if the ratio of non-performing assets to total loans rises, profitability will fall, and vice versa⁶⁵.

Related studies revealed an antagonistic link between non-performing loans (NPL) and bank profitability¹⁰. As a result, they recommended that banks exercise careful credit risk management, protect their assets, and look out for the interests of investors. Similar to other businesses, banks must generate enough revenue through lending and other fiduciary activities or services to pay their operating and financing expenses. They must also reinvest retained earnings to fund future operations. This will improve their growth and profitability in addition to ensuring their survival⁷².

According to a panel regression study, the trio of cost per loan, loan loss provision, and non-performing loan, which were employed as measures of credit risks, have a negative effect on the profitability (performance) of banks. According to the study's findings, non-performing loans in Nigeria are growing in the same direction as DMBs' overall loans and advances⁷¹. This supports a report by the International Monetary Fund from 2018 that noted an increase in total loans from 5% in 2015 to 15.6% in 2017.

Although the majority of studies conducted in Nigeria showed that non-performing loans hinder bank profitability, the study of certain writers showed the opposite. The study came to the conclusion that a spike in non-performing loans improved the performance of the banks under investigation, noting that bad loan recovery results in higher interest rates, which boost

profitability. However, it might be argued that the higher interest rate, not the unrecovered loan in and of itself, was what truly contributed to the improved performance⁷². The ratio of non-performing loans to total loans, as employed in this study, is one indication of asset quality. A higher ratio may indicate bad credit judgment.

2.1.2.2 Non- Performing Loans (NPL)

A non-performing loan is a risk factor in organizations providing credit, especially DMBs. It relates to loans for which the service agreement with reverence to its liquidation is in full or part default. Non-performing loans are loans that are not generating interest because complete receipts of principal and interest are no longer probable from debtors and the facility has become delinquent for 90 days or additional. According to this definition, a loan is considered to have crossed the line into non-performing status if the interest on it and/or the principal remain wholly or partially unpaid for a period of 90 days or more⁷³. It is in this light that the CBN Prudential Guidelines categorized non-performing loans into three: substandard, doubtful and lost. Loans that have not been fully repaid for a period of 90 but fewer than 180 days are considered substandard non-performing loans. Doubtful loans remain irrecoverable for 180 but less than 360 days, while the loss category has a default period of 360 days or more. For each classification, the days in default start counting from the day loan repayment of both interest and principal are to commence⁷⁴. High levels of non-performing loans cause banks to fail because they negatively affect liquidity and limit their ability to extend credit. This, in addition to negatively impacting banks' performance also slows down growth in the real sector of the economy⁷⁵.

The predominance of non-performing assets is a serious danger to the banking industry (NPAs). NPA stands for "non-performing assets," or bad loans for which the borrowers weren't able to make their payments. NPAs in the loan portfolio have an impact on operational efficiency, which

has an impact on the profitability, liquidity, and solvency of banks, according to a study¹⁰. Non-performing loans will have an impact on banks' profitability, which is their primary source of income, and ultimately the financial stability of the economy. Bankruptcies and economic slowdown may result from low asset quality or a significant quantity of non-performing loans⁷⁶. Since lower quality assets, also known as toxic assets, were one of the main causes of the global financial crisis in 2008, measuring non-performing loans, thoroughly examining their effects, and developing the necessary economic policies are crucial for both the overall economy and the banks themselves.

The variables that influence asset quality are hence non-performing loan ratios. Scholars from several disciplines use various fiscal ratios to analyze the performance of banks. All DMBs are primarily concerned with limiting the overall amount of non-performing loans. This is true since increased nonperforming loans have an impact on the bank's profit. Therefore, minimal nonperforming loans show that a bank's portfolio is in good shape. The performance of the bank is improved by a lower ratio⁷⁷. Liquidity is impacted by poor asset quality since it lowers the asset's value. The danger to the bank's liquidity is increased by non-performing assets because they will make the bank less liquid. More nonperforming assets mean less liquidity, which increases the risk that the afflicted bank won't be able to fulfill its settlement commitments. The interbank market transaction, which depends on the counterparty's trustworthiness and creditworthiness, is likewise impacted by this. Such a decline in confidence might eventually have an impact on cash inflow, particularly when wholesale sources appear to be unreliable⁷⁸.

The profitability of banks is inversely correlated with non-performing loans (NPL). As a result, they recommended that banks exercise careful credit risk management, protect their assets, and look out for the interests of their investors⁷⁸. Additionally, in order for banks to continue operating,

they must generate enough revenue from lending and other fiduciary services to pay for their operational and financing expenses as well as reinvested retained earnings to support future operations. This will improve their growth and profitability in addition to ensuring their survival⁷². Bank asset quality and operating performance have a positive relationship from the standpoint of management accounting since a bank's insufficient asset quality will force it to incur higher bad debt losses and devote more resources to the recovery of non-performing loans⁶⁶. Asset quality has been proven to be a statistically significant predictor of insolvency as the root cause of bank failures, and failing financial institutions consistently have high levels of non-performing loans before failing⁷⁰. Additionally, the issue of NPAs has come to be associated with the functional effectiveness of financial intermediaries and is thought to be one of the main contributors to problems with economic stagnation.

Non performing loans (NPL) that the bank anticipates having trouble recovering are of different categories. They consist of non accrual loans, non-performing leases, loans with reduced interest rates, loans that have been renegotiated, and loans that are 90 days or older past due. They do not include personal property or assets obtained through foreclosure. NPAs typically result from the borrower's default, which is defined as his inability or unwillingness to fulfill the loan's obligations. Bad loans, also known as non-performing assets (NPAs), have been a threat to the global banking industry. Although non-performing assets are a constant feature of financial organizations' balance sheets, they must be carefully managed. Otherwise, they eventually result in crisis, which poses significant risks of spread that could jeopardize the stability of the financial system.

The resilience and stability of the banking sector play a key role in determining the financial stability of an economy. Banks needed to maintain high-quality assets that support profitability in

order to achieve banking stability. In the event of market illiquidity and/or bank contagion, failing to preserve banking stability might result in financial instability and perhaps a crisis. In light of the 2008 global financial crisis, which led to the collapse of financial markets and institutions, it is easier to see the importance of banking stability. Additionally, it is anticipated that output per capita will decline in nations that account for 75% of the world economy. The overall stress level in the banking industry has increased as a result of the concomitant worsening of the economic climate⁷⁸.

The direct cause of the quick development of systemic risk in Serbia's banking and financial sector as a whole was non-performing loans (NPLs). Infection of the financial sector with non-performing loans (NPL proportional share in the financial sector's assets with NPL / AFS) is a new systematic indicator used in the paper to measure the spread of systematic risk within the financial system. Macroeconomic contagion with non-performing loans (NPL expressed as a percentage of the financial sector's assets with NPL) is a new synthetic indicator used by the authors to assess the possibility of systematic risk spreading to the real sector⁷⁹.

Bank failure is the direct result of the NPAs in the banking sector starting to bubble up. Given this well-established fact, the topic of NPAs has recently attracted more interest. Asset quality is a statistically significant predictor of insolvency for the reason behind bank failures, according to numerous studies. Prior to failure, non-performing loans are almost always at a high level in failing banking organizations. The issue of NPAs has come to be associated with the functional effectiveness of financial intermediaries and is thought to be the main factor contributing to economic stagnation^{76,80}. The Global Financial Stability Report lists two of the three key tasks that directly relate to NPAs as identifying and managing distressed assets, recapitalizing weak but viable institutions, and resolving failed institutions. It goes without saying that improved

profitability is supported by better asset quality. Banks must therefore effectively manage their asset quality as well as other factors that affect profitability. A fresh examination of the variables affecting banks' performance is necessary in light of the rising prevalence of poor bank asset quality.

The primary activity of banks, which operate on the theory of money creation, is credit advancement; as a result, there is a strong probability that banks will fail if the money they lend out is not repaid by borrowers. Therefore, banks place a lot of focus on managing bank credit risk, which aims to lower the likelihood that borrowers may miss loan payments, especially to the point of creating nonperforming loans (NPLs). NPLs are loans that have not been repaid in full for at least 90 days, indicating that they have not generated any income for a considerable amount of time⁸¹. Researchers who have studied the connection between NPLs and macroeconomic effects have discovered that NPLs are a major cause of credit market frictions and macroeconomic financial vulnerability. Additionally, the study contends that rising NPL levels are a sign of macroeconomic weakness⁸².

Credit risk management is essential and pivotal to the proper functioning of banks and all the entire financial system; this becomes increasingly crucial when the ratio of owners' equity to total assets employed by banks is so low that NPLs could easily cause a bank to fail. Researchers identify the interest margin of banks as the principal foundation of bank profits. Bank failure is imminent if NPLs are not held in check as an growth in NPLs reduces interest income, hence a decline in net interest margin. This reasoning, however, runs contrary to one of the basic tenets of finance, standard asset pricing, which argues that as a firm takes on more risk, its expected return should be higher⁸³. In this case, high levels of credit risk, proxied by NPLs, should lead to high levels of return.

There is evidence in support of the view that High rates of economic growth are observed in economies with a sound commercial banking system⁸⁴. As opposed to that, a poorly functioning banking system could be a recipe for intensified poverty and slow economic growth. As the backbone of the financial system in several African countries, it could be economically crippling and disastrous to have banking systems collapse under the weight of high levels of NPLs⁸⁴. This assertion is not stretching the truth too far as researchers indicate that NPLs can be used to mark the onset of a banking crisis, which are probable causes of economic downturns. It has been documented that many of the historical bank crises that have been witnessed are as a result of high levels of NPLs within the sector. The global financial crisis of 2007/2008, triggered by default of borrowers from sub-prime mortgages/loans in the USA for instance, indicates the adverse rippling effect NPLs can have on economic fortunes⁸⁵.

It was asserted that in countries where there is heavy lending in foreign currencies to unhedged borrowers, exchange rate depreciations lead to an increase of NPLs⁸⁶. Also affirmed that exchange rate depreciation decreases private credit and worsens loan quality⁸⁷. Additionally, countries with large stock markets relative to GDP, a bearish market can negatively affect bank asset quality⁸⁶. In relation to the role of the stock exchange in determining NPLs, study found that contrary to popular thought that when a stock market is performing really well it is able to provide a buffer to borrowers from unexpected shocks by facilitating real equity returns have no statistical correlation to nonpayment of loans, whether they are used to seek credit or to pay off current debts⁸⁷.

One of the main contributors to the large interest rate spreads that African firms and individuals must deal with has been identified as a high number of NPLs. It is crucial that we have a thorough understanding of the causes of the NPLs problem so that it may be addressed in order to

foster an atmosphere that is conducive to business, prevent any banking crises proactively, and preserve a stable economic environment⁸⁸. A study found empirical evidence supporting the theoretical view held that as interest rates increase, NPLs also increase⁸⁹. Study also reports a positive correlation between lending rates and NPLs⁹⁰. This positive relationship as identified in literature is mainly due to difficulty in servicing debt.

On the other hand, it was found that capital requirements reduce NPLs; they find that for banks with market power, this effect significantly diminishes⁹¹. A study examined the association amongst capital regulation and banking risk. The cancelled share of the line should read, using a large international panel data set for the 1998-2008 period, they find that the effect of capital regulation on banking risk can be a positive or negative effect depending on certain bank characteristics and other regulations Moreover, the macroeconomic environment⁹². Additionally, study also discovered a bad correlation between the CAR of Indian banks and NPLs in the sector⁹³.

It is also crucial. to note that the impact of bank credit advancement policy is mentioned as a determining factor of bank NPLs. Study find a strong empirical support of a positive relationship between rapid credit growth and loan losses⁹⁴. A similar correlation between lagged credit growth and NPLs is discovered by another study⁹⁵. A study that used the instrumental variable (2SLS) approach examined the factors that contribute to NPLs in five CEE nations. Their calculations backed up the idea that the expansion of credit and the amount of financing available could hurt banking performance and worsen the dynamics of NPLs⁹⁶.

From the management accounting perspective, bank asset quality and operating performance are positive related because if a bank's asset quality is insufficient such will have to increase its bad

debt losses as well as expend more resources on the collection of non-performing loans⁹⁷. In order to manage and oversee the collection process, banks will incur additional operating costs from non-value-added activities when they list the loan amount for collection. Examples of these activities include regularly monitoring the debtor's financial situation, keeping an eye on the collateral value, rearranging the amortization schedule, paying costs associated with contract negotiations, calculating the costs to withhold, etc. Gaining management and public trust, maintaining the banks' safety and completeness, keeping the banks from receiving a negative rating as a result of external affairs, reducing deposits due to a decline in client confidence, and other costs are among the costs, extra costs to monitor loan quality, and higher future costs generated by the ignorance of the problems from other operations that is generated when the loan quality issues grips the attention of the senior management⁶⁴.

Since interest income from bank assets forms an important component of a bank's net income, impaired loans or poor asset quality shows adversely on bank profitability. A study shows a negative association between bank spreads and NPLs over total loans for most Latin American banking systems. It argued that this is due to distortions caused by inadequate regulation that allow banks to report misstated loan losses⁹⁸. A similar study finds a negative relation bank profitability and credit risk. They explain that the result shows that in the Greek banking system, managers attempting to maximize profits seem to have adopted a risk-averse strategy⁹⁹. A study in a paper which examines the determinants of performance of Greek banks during the period of EU financial integration find that the impact of loan loss reserves (a measure of asset quality) to loans on return on average assets (ROAA) is negative and statistically significant¹⁰⁰.

Numerous authors have expressed the idea of NPLs in the literature. The length of time that passes before a loan is labeled as non-performing (NPL) is one characteristic of NPL that is prevalent. NPLs have been described as loans that do not generate income over a sustained period of at least three months¹⁰¹. In the same vein, it is expressed NPLs as loans that are 90 days or more past due or no longer accruing interest¹⁰². The IMF Financial Soundness Indicators Compilation Guide of 2006 recommends that loans are classified as non-performing when payment of principal and interest are past due by three months or more or when interest payments equalling or more than three months' worth of interest have been capitalized, refinanced, or rolled over. The IMF Guide makes the intriguing claim that a loan might also be labeled as non-performing if the debtor declares bankruptcy. NPLs are divided into four categories in Nigeria: substandard, questionable, highly doubtful, and lost.

In Nigeria, the Central Bank of Nigeria (CBN) streamlined deposit money banking operations in addition to creating a special purpose entity to handle the accumulation of NPLs and to provide clarity on the conduct of deposit money banking activities in terms of geographic coverage, among other things. Deposit money banks with operational licenses at the international, national, and regional levels were introduced by the policy¹⁰³. As the names imply, a deposit money bank with international license is allowed to maintain offshore banking operation in the jurisdiction of its choice within and across the national boundaries; a national licensed bank carries out banking operations within national boundaries while regional licensed banks operate within specified geographical locations in Nigeria. The repositioning ensured that banks' operational coverage is commensurate to their paid-up share capital. These measures put in place to address the ailing capital structure attributable to NPLs impacted the banking system positively up to end 2014.

2.1.2.3 Loan Loss Provision

As a result of the difficulties and crises facing banks recently, Loan Loss Provision (LLP) has a key role to strengthen the financial position of the banks. LLP is defined as a policy that followed by deposit money banks by putting some money aside (reserves) to face any potential loans default, which in turn would help to protect banks' positions in terms of profitability and capital¹⁰⁴. The main objectives of LLP is to provide special information about the bank's future; reduce taxes by earnings managing, and management of regulatory capital; managing the level of income volatility and the volatility of earnings; and avoiding fluctuations which occur in risk-weighted assets that in turn affect the bank's risk and profitability¹⁰⁴.

The provisions for loan losses-to-total loans (PLL/TL) ratio provides a portion of the principal risk. However, we prefer to present initially the results with the participation of that variable in order to cover the whole set of possible risks that a bank can face. Unfortunately we do not have enough data to include other credit risk measures, as are the net charge offs or the non-performing loans to total loans. Finally, as a measure of interest rate risk we include the *gap-to-assets ratio (Gap)* which is defined as the difference between interest rate sensitive assets and interest rate sensitive liabilities divided by total assets of each financial institution¹⁰⁴.

The idea of credit risk is really incontrovertible across financial services entities. Therefore, a loan loss provision is an amount, which is set aside for uncollected loans or credits. It is calculated as loan loss provision to total loans. The rate of loan loss provision to total loans makes the bank managers to know their expectation about bank's asset quality. When giving out loans, banks are conscious of the circumstance that borrowers could default, thereby not able to fully pay up the loan. When it reveals that the borrowers may not redeem their loans, a bank will set aside a 'provision' to be charged to the income statement, which then appears on the face of the statement of financial position as a loan loss reserve. If a customer defaults eventually, the loan balance

would then be reduced by making a charge to the loan loss reserve. The higher the ratio, the lower is the asset quality and vice versa. In this study, the loan loss provision to total loans will be used as a variable to measure asset quality, which is consistent with other scholars^{105,106,107,108,109,110}.

Since changes in banks' profitability and capital positions have an impact on their ability to lend money to the economy, loan-loss provisioning policy is vital in assessing the stability of the financial system¹¹¹. Loan loss provisions, in theory, allow banks to record an expected loss from a specific loan portfolio in their profit and loss statements before the actual loss can be accurately and confidently assessed as events develop and is actually written off. In other words, if banks expect future losses on the loan portfolio when the economy experiences a downturn, loan-loss reserves should result in direct charges against earnings during economic upturns.

Banks can then call on these reserves when the projected loan losses inevitably materialize, absorbing the losses without depleting valuable capital and protecting banks' ability to continue providing credit to the economy. If bank management believes that their loan portfolio is of high quality, then the extent of loan loss provisioning should be able to show that opinion. If provisions are to be viewed as a true indicator of credit risk, then they must be able to cover the full range of anticipated credit losses. Accounting frameworks do not fully address the issue of projected losses because they only provide provisioning for losses that have already occurred as of the date of the financial statement¹¹².

Ideally, the extent of loan loss provisioning, should be able to reflect the beliefs of bank management on the quality of the loan portfolio that they have, indicating that provisions should be able to cover the whole spectrum of expected credit losses if they are to think of provisions as a measure of true credit risk¹¹³. Another issue is that accounting rules only provide providing for

losses that have already occurred as of the date of the financial statement, which largely ignores the idea of "anticipated losses"¹¹³. An excess of cash in comparison to the proper amount of prudent loans being given out could also cause yields to be chased, the perception of credit risk to be reduced, and consequently, the need for commensurate provisions to be reduced. When an economic downturn happens, if provisions are unable to cover the full range of anticipated loan defaults, the bank will obviously need to use capital to cover the extra loss¹¹².

Due to insolvency and illiquidity brought on by non-performing loans, several of the regional banks established in Africa's Kenya, Nigeria, Uganda, and Zambia have been shut down or taken over by their Central Banks. Adverse selection and moral hazard issues contributed to the severity of the bad debt issues¹¹⁴. Several factors contributed to the moral hazard on bank owners to take excessive risks with depositors' money. These included low bank capitalization levels, access to public sector deposits via bank owners' political connections, an excessive concentration of ownership, and regulatory laxity. The report also recommended that the local banks can make a potentially valuable contribution to the development of financial markets in Sub-Saharan Africa, especially by improving access to loans for the domestic small and medium scale business sector. They can also inject much needed competition into financial markets and offer customers better services. Local banks have survived and operate as sound institutions in all four of the countries covered here despite the very difficult conditions such as acute macroeconomic instability, which indicates that the risk of licensing local banks is worth taking, even while there will always be more dangers for local banks than the established foreign banks in view of the nature of the markets which they serve¹¹⁴.

According to the kind of credit, banks are permitted to charge-off debt (damaged loans) when it reaches a specific level of delinquency (debt). Once it is possible that a bank loan won't be repaid when it is due in accordance with the terms and circumstances of the loan arrangement, it is considered impaired. Charge-offs of impaired loans are recorded as expenses in the income statement account. Especially in the year the charge is made, this has a deteriorating impact on the asset's value and the bank's financial condition, including the net profit. Therefore, impaired loan charge-off is an expansion of credit risk that has an impact on DMBs' financial performance. Such situation occurred to Diamond bank Plc. whose huge non-performing loan level led to its impairment charges of 25 billion naira yearly. The bank consequently reported a profit after tax of less than 3 billion naira in its 2018 nine-month financial report¹¹⁵.

The most generally used measure is the ratio of loan loss provisions to the bank's total gross loans, analyzes the quality of the bank's assets and its credit quality¹¹⁶.

2.1.2.4 Capital Adequacy (CA)

One of the characteristics unique to banks that affect how profitable a bank is is capital. A bank's capital is the sum of its own money that is available to maintain operations and serve as a safety net in the occurrence of adversity¹¹⁷. Owing to the fragility and susceptibility of deposits to bank runs, bank capital helps to create liquidity for the bank. More bank capital also lessens the likelihood of financial distress¹¹⁸. The fact that it results in low demand for liability, one of the cheapest sources of funding, is a disadvantage, nevertheless. The amount of capital that banks must have in order to be able to resist risks including credit, market, and operational risks they are exposed to in order to absorb potential losses and safeguard the bank's debtors is known as capital adequacy. The capital adequacy ratio is used to calculate the capital adequacy of a company

(CAR). The capital adequacy ratio demonstrates the bank's internal capacity to withstand losses during a crisis. The bank's resistance to crises is directly correlated with its capital adequacy ratio. It also directly influences banks' profits by influencing their development into hazardous but lucrative enterprises or sectors¹¹⁹.

Deposit money banks must have enough capital to operate effectively because it offers security against failure. How much and what kind of capital a bank needs to maintain so as to have appropriate protection is the key question¹²⁰. The portion of the bank's liabilities known as capital does not need to be repaid and is therefore accessible as a safety net in the event that the asset worth of the bank decreases¹²¹. Banks do not always turn a profit, hence capital is needed to serve as a safety net when banks suffer significant losses. When a bank's total liabilities exceed its whole assets, the bank becomes insolvent and its equity holders are likely to decide to stop paying its debts¹²².

One of the main concerns of prudential regulation is the adequacy of capital in the financial industry and for banks in particular. Due to incomplete information and agency issues brought on by the nature of the financial intermediation business, the banking public is not capable of evaluating the safety and soundness of banks or other financial institutions. Therefore, capital adequacy is to guarantee the banks' solid financial standing. The value of a bank's net assets can be used to define its capital (total assets minus total liabilities). Therefore, capital is the total of a company's paid-up share capital and accumulated capital reserves. The protection of bank depositors, the development and maintenance of public trust in bank operations, and the stability and long-term growth of banks all depend on capital¹²².

Setting minimum capital requirements for market risk on the books of banks and investment firms is known as capital adequacy. This involves defining criteria, discussing risk management, and requiring a solvency ratio of requirements¹²³. A bank should have capital funds that are at least 10% of its deposit liabilities, according to the Basel Accord, which is an international requirement for capital adequacy. According to conventional wisdom, a bank's statutory capital is regarded appropriate if it is sufficient to cover customers' withdrawal requirements and shield depositors from a whole or partial loss of their money in the case of the bank's dissolution or other losses. A bank's statutory capital is frequently deemed appropriate if it is sufficient to pay operational costs, meet customer withdrawal requests, and safeguard depositors from losing all or part of their money in the case that the bank is liquidated or suffers losses¹²⁴.

The amount of capital that a financial institution should have and intend to keep in order to run its intermediation and investment activity responsibly is known as capital adequacy. Accordingly, sufficient capital is thought of as the quantity of capital that can enable banks to successfully carry out their main job and offer the highest level of protection against insolvency resulting from banking risk. The amount of capital that a bank maintains or plans to have in order to simplify and facilitate its business operations and activities effectively and safeguard the bank from insolvency and failure is regarded as capital adequacy. However, liquidity refers to a bank's capacity to pay its debts as they become due, whereas solvency refers to a bank's ability to repay its debts over the long term¹²⁵.

In order to inspire and maintain confidence in banks, keep them open and operational so that time and earnings can absorb losses without liquidation, and allow the banking sector to fully capitalize on its lucrative growth potential, adequate capital is the least amount required¹²⁶. The shareholders' fund to total asset ratio is approximately, in accordance with the CAMEL technique

to evaluating capital adequacy of banks and determining their soundness and safety¹²⁷. This ratio serves as a gauge for a bank's financial health and shows how well-equipped it is to deal with unforeseen losses. This ratio is said to have a good correlation with banks' sound financial performance. This implies that financial performance must learn to adapt or respond adequately to the demands of its capital adequacy measures in order for banks to conduct their intermediation and investment function as efficiently as possible.

Among the most important contemporary challenges in banking that assesses the degree of a bank's effectiveness and safety is capital adequacy ratio. An international norm for determining capital adequacy ratios is the Basel Capital Accord. The Accord suggests that banks adhere to minimum capital adequacy ratios. By lowering the likelihood of bank failure, using minimum capital adequacy ratios contributes to the stability and efficiency of the financial system. The regulatory authorities have worked to strengthen banks in the wake of the financial crisis. To do this, governments all over the industrialized world are putting pressure on their citizens to strengthen their balance sheets by raising capital, and if they are unable to do so, to lessen the quantity of risk assets (loans) that are recorded on their books¹²⁸.

From a CAMEL perspective, one of the unique internal elements that influence bank profitability is capital adequacy. Capital is the amount of cash on hand to sustain a bank's operations and serve as a safety net in the event of adversity because deposits are the most vulnerable and susceptible to bank runs, bank capital generates liquidity for the bank⁷⁸. In line to this theory, capital has a positive correlation with banks' financial performance since it reduces the probability of liquidity constraints. More bank capital also lessens the probability of hardship. The fact that it results in low demand for liabilities, the inexpensive sources of capital, is not without disadvantages, though. The amount of capital that banks must have in order to resist risks like credit, market, and

an operational hazard, absorb potential losses, and safeguard their debtors, is known as capital adequacy¹²⁹.

Capital adequacy is measured by the ratio of total capital to total risk weighted assets. Bank equity capital can be viewed in two ways as stated by the amount the owners of a bank contribute (paid-up share capital) that gives them the privilege to take pleasure in all upcoming earnings and the quantity of owners' funds obtainable to enhance a bank's business which includes reserves, and is also seen as total shareholders' funds. Bank's capital is generally used as one of the elements of bank profitability since it specifies the financial strength of the bank¹¹⁷.

The extent of capital deemed necessary by regulatory and supervisory institutions to ensure a bank's financial stability and soundness is known as capital adequacy. Capital adequacy as a measure of the soundness of a bank, tells whether a bank has enough capital to back the risks in its statement of financial position. Adequate capital is a significant variable in the business of managing other peoples' money such as banking¹²⁴. Also, that a bank capital is assumed adequate if it is sufficient to cover the banks' working expenses, satisfy customers with their needs and keep depositors against total or partial loss of deposits in the event of insolvency or loss sustained by the bank.

A key factor in determining the durability and dependability of the banking system is capital adequacy. Banks with realistic capital can absorb the unexpected losses and their cost of funding can also minimize which ultimately can improve banks' financial performance. The concept of capital adequacy is entrenched in the restructuring of the current capital structure of banks to alleviate wide spread distress. Banks, as financial institutions and business establishments, gain more prospects in an atmosphere of adequate capital¹³⁶.

Capital deficiency is a sure symptom of trouble in a bank, and it plagued the Nigerian banking industry. The Nigerian banking sector was heavily controlled before the financial sector was liberalized in 1986. The CBN anticipated banks to play developmental roles by offering subsidized credit to the priority sectors, but some of them lacked the necessary skills to do so. Additionally, the bulk of the loans given to the priority sectors were not returned, which made these banks' liquidity situations worse¹³⁷.

Since proper capital has a direct and inevitable effect on the amount of funds available for lending, which always has an impact on the mode and extent of risk absorption, its effect on banks' performance cannot be understated⁹⁸. Notwithstanding its many roles and various functions, it is pure that bank capital is stand-in as defensive cushion against losses hastened by certain kinds of doubts. This view capital as a restraint to avoid default and capital also stands as a bolster to protect customers and other creditors against losses at the functional and liquidation period³⁰. Furthermore, if depositors' funds are going to develop, capital must grow together with it and that management competency also has an effect on capital adequacy. In this light, capital restraint helps to escape over-trading and controls malpractices by management¹³⁸.

Adequacy of capital can help to improve and sustain the financial assets of a business with an idea to broadening the extent of long-term capitals available to the business. The purpose for this is to fill a gap, provided by working capital and financing capital projects. A gap could be found through repeated losses, worsening on quality of assets, under-provisioning and fraud. The fresh addition of funds could then help to afford more working capital, computerization programs etc⁹⁹. It is well-known that the higher the capital requirement of any company the easier for it to fascinate any impact of abrupt mishaps, the larger the size of the operation the bank can handle, the lower the risk the bank is likely to have¹³⁸.

Adequate capital no doubt denotes a main component in shaping the insight of the solidity of the bank and with the active involvement of banks in the capital markets the public's view of the bank's capital has acquired immense importance in that it has become the basic reference for classifying the bank's standing vis-a vis its competitors¹³⁹. The minimum ratio of capital to total risk-weighted assets should remain at 10% as prescribed in circular BSD/11/2003 dated 4th August, 2003. The circular also stated that at least one half of a bank's capital should comprise of paid-up capital and reserves, while every bank should maintain a ratio of not less than 1: 10 between its adjusted capital and total credit net provisions. Banks in Nigeria are therefore counseled to maintain a higher level of capital which is commensurate with their risk profiles¹⁴⁰.

2.1.2.4.1 Capital Adequacy Ratio (CAR)

Bank authorities around the world are quite concerned about capital adequacy standards for banks that conduct business globally. As a result, the Group of Ten (G10) industrialized nations of the globe and the Bank for International Settlements (BIS) developed a framework for determining the capital adequacy of banks in those countries. The Basel Capital Accord on Capital Adequacy Standard is the name given to the standards that were adopted in the city of Basel. Bank authorities all throughout the world adopt the Basel Agreement's Capital Adequacy Standard¹³⁰. For any institution, capital serves as a backup plan in the event of unanticipated circumstances. Knowing how much equity owners are contributing in relation to each Naira of total capital is crucial. Tier one capital, which can absorb losses without forcing a bank to stop operating, and tier two capital, which can absorb losses in the case of a winding-up but offers less protection to depositors, are the two forms of capital that are measured. Total capital to risk-weighted assets, or CAR, is the measurement used.

Tier one capital, such as ordinary share capital, is capital that is readily and permanently available to a bank so that it may absorb losses without having to cease operations. Tier two capital offers less protection to depositors and creditors even though it is the one that absorbs losses in the event that a bank must close. If a bank loses all of its Tier One Capital, it is utilized to absorb losses. Adjustments are made to the asset values shown on a lender's balance sheets in order to calculate credit exposure. Based on the risk involved, the bank has assigned a weight to each loan it has made. For instance, loans made to the government are weighted at 0% whereas loans made to private persons are given a 100% weighted score. According to Basel II, the overall capital ratio cannot be less than 8%¹³¹.

The capital adequacy ratio, which is employed as a gauge of a financial institution's stability and strength, is the proportion of primary capital to assets¹³². The major justification for stringent regulation of banks' capital structures is that capital is a crucial element in preventing losses that depositors would likely experience in the event that a bank fails. The likelihood of highly leveraged companies taking undue risks to maximize shareholder wealth at the expense of financiers is highest¹³³. The capital adequacy ratio (CAR), which is used to assess capital sufficiency, demonstrates how well-equipped a bank is internally to handle losses during a crisis. CAR is closely correlated with a bank's ability to weather crises, and it also has a direct impact on the bank's profitability by influencing its development into hazardous but lucrative ventures⁶⁷.

Functionally speaking, adequate capital is viewed as the amount of capital that can successfully carry out the core responsibilities of banks and avoid bank failure by absorbing losses. Due to the risks that banks take on so as to meet the community's legitimate credit demands, these losses are tied to those risks. The best defense against bankruptcy and liquidation resulting from the risk in the banking industry is enough capital. Any business or bank with insufficient capital will be

subject to limitations. Its management time is spent on the defensive, working out how to raise capital or how to guard against takeover¹³⁴.

When a bank has sufficient capital, it can meet the requirements for its size of business, operate safely, maintain the trust of the public, and buy the infrastructure required for efficient operations¹³⁵. Adequate capital creates an avenue for better standards in any business establishment. It spurs business capacity and better performance. It is in this wise that the CBN from time to time prescribes the minimum regulatory capital adequacy ratio (capital to total risk-weighted assets) for banks based on the relevant risk factors and the internal capital adequacy assessments of each Bank. This is done to make sure that a bank's capital levels match its overall risk profile. Therefore, based on a bank's unique risk profile and risk management systems, a greater level of minimum capital adequacy ratio may be required under the Pillar 2 framework.

A high capital adequacy ratio should indicate a bank that is working too cautiously and missing out on potentially profitable trading opportunities, which indicates a negative relationship between equity to asset ratio and bank profitability, according to previous studies on capital adequacy as a determinant of performance of banks¹⁴¹. A study that looked into how capital impacted bank performance throughout financial crises discovered a strong link and significant effect of capital on bank profitability. It noted that while operating at international level, banking regulators demand high level of capital to make sure that the banks are more capable to take extra risks associated with global trading¹⁴².

The core capital held in a bank has a straight connection with the earnings of the local banks. More capitalized banks are extramoneymaking because they have enough financial resources to invest in high return investments which generate higher returns for the banks¹⁴³. Capital plays a

vital role in a bank's performance, as the banks that have higher capitals perform well as compared to undercapitalized ones. A direct association between capital levels and the bank profit was concluded in a study of European commercial banks. A significant direct link between the core capital and profit of banks was also found by some authors^{144,145}.

A bank with little capital would aim to conserve its capital by allocating fewer assets to loans because loans carry the highest risk weight. This trend becomes more severe as the capital constraint becomes binding which is the case for banks with less than the required capital level. However, for banks with high capital adequacy ratios, there is little impact on loan growth. Capital constrained environment banks will lessen the supply of loans. The reduction in the supply of loans is greater for banks which are inefficient¹⁴⁶. The consequence of higher capital standards on the reserve of bank credit in the economy would have a greater impact in economies which have a bank dependent or dominated financial system as opposed to a capital markets dominated system. At the same time, banks with high level of equity to asset ratio will ordinarily have lower requirements of external finance and therefore higher profitability¹⁴.

Researchers that looked into how capital impacted bank performance during financial crises discovered a strong link and significant impact of capital on bank profitability. While operating at international level, banking regulators demand high level of capital to make sure that the banks are more capable to take extra risks associated with global trading¹⁴². The earnings of the regional banks are directly correlated with the amount of core capital kept. More capitalized banks are more profitable because they have sufficient financial resources to invest in high return investments which generate higher returns for the banks¹⁴³. Capital plays a vital role in a bank's performance, as the banks that have higher capitals perform well as compared to undercapitalized ones. A direct association between capital levels and the bank profit was concluded in a study of

European commercial banks¹⁴¹. A significant direct link between the core capital and profit of banks was also found by researchers^{144,145}.

2.1.2.4.2 Methods of Assessing Capital Adequacy

i Capital Adequacy Ratio (CAR) Based on Basel III

This ratio is known as the Total Capital-to-Risk Weighted Assets Ratio. CAR is the overall capital indicator of a bank. This ratio establishes a bank's ability to fulfill temporary obligations and other risks such as market risk, operating risk, credit risk, and others. It also calculates the amount of capital used to promote the risk assets of the banks¹⁴⁶. In addition to Tier 1 capital, the ratio measures Tier 2 capital, which is a type of supplementary bank capital. Undisclosed reserves, general loss reserves, subordinated debt, hybrid debt, and equity are all part of Tier 2 capital. The Tier 2 capital ratio reveals the amount of losses a bank can tolerate in the case of a winding-up, which means depositors are less protected¹⁴⁶. The countercyclical buffer's goal is to meet the broader macroprudential goal of shielding the banking system against cycles of excessive aggregate loan expansion. The minimum criteria for risk-weighted assets (RWAs) are 4.5 percent common equity (RWAs), 6.0 percent Tier 1 capital (RWAs), and 8.0 percent total capital (RWAs). The difference between the overall capital requirement of 8% and the Tier 1 requirement can be used to satisfy Tier 2 and higher categories of capital¹⁴⁶. RWA is calculated according to the formula $RWA = \text{Total Qualifying Capital} / \text{Total Risk Weighted Assets}$.

ii Deposit assets ratio (DAR)

One of the key functions of deposit money banks is to accumulate funds in the form of deposits from the surplus sectors of the economy and make the same available to the deficit sectors of the

economy. Thus, deposits constitute a significant proportion of banks total current liabilities and, as such, require the maintenance of adequate capital by banks. Adequate capital for banks is the level at which the deposit-insuring agency would just break even in guaranteeing the deposits of individual banks with the premium the bank pays. Capital is a difference between assets and deposits, so the larger the ratio of capital to assets (or the ratio of capital to deposit), the safer the deposits. As capital was adequate, deposits were “safe enough”. His idea was that if the value of an institution’s assets declines in the future, its’ deposits will generally be safer, the larger the current value of assets in relation to the value of deposits¹⁴⁶. DAR is calculated according to the formula $DAR = \text{Total Bank Deposits} / \text{Total Assets}$.

iii Risk Asset Ratio (RAR)

The risk asset ratio evaluates the amount of a bank's total regulatory capital in relation to the amount of risk it is taking. The idea is that all banks must assure that a reasonable proportion of their risk is guarded against by permanent capital. Banks must keep a minimum RAR (total capital ratio) of 8%. Effectively, this means that 8% of the risk-weighted assets must be guarded against by permanent or near-permanent capital. The higher the capital adequacy ratios a bank has, the greater the level of unanticipated losses it can absorb before insolvency. So the less risky it should be, Also known as the solvency ratio¹⁴⁶. RAR is calculated according to the formula $RAR = \text{Risky Weighted Assets} / \text{Total Assets}$.

iv Asset quality ratio

The condition and quality of individual asset categories can trigger financial problems and act as an important accelerator of bank fragility. Provisions for loan losses caused a decline in CAR. The

asset quality ratio is used to determine the impact of new provisions for possible loan losses and loans written off on the bank's capital level. Banks with more loan loss reserves are more aggressive in their lending practices and are willing to accept losses instead of negotiating concessions with loan defaulters¹⁴⁶. In addition, high loan loss reserves may signal banks that they are willing to write off problem loans, which are expected to reduce bank credit risk. The reduction of non-performing assets is necessary to improve the profitability of banks and comply with the capital adequacy norms as per the Basel Accord¹⁴⁶. AQR is calculated according to the formula $AQR = \text{Total Non performing Loans} / \text{Gross Loan}$

2.1.2.5 Risk Weighted Capital

This is the most widely used method for calculating the capital adequacy ratio of deposit money banks, and as such, this study also used this method to go in line with others who see it as the most superior in assessing the capital adequacy ratio. According to the definition provided in the Central Bank Regulations, the split of primary capital into to the total of risk-adjusted assets based on risk factors in percentage results in capital adequacy. Assets and bank capital are the two most important variables in calculating the bank's rate of capital adequacy. The final number is divided into the primary capital and the capital adequacy ratio is determined after calculating the total assets and obligations assigned to risk. One of the key elements in lowering bank risks is bank capital. Due to the fact that a bank with greater capital may more easily survive in challenging economic conditions, the capital adequacy ratio, which is frequently defined as the primary capital split into assets assigned to risks, is a crucial proportion to evaluate banks¹⁴⁷.

The need to maintain a definite sum of capital is an significant matter to banks and supervisor for years; that stands to take cash from the depositors to provide facilities for them. In this process

maybe some borrowers are unable or unwilling to pay back their advances, in this situation the only source that bank can rely on it is bank capital. Therefore a cautious relationship should be existed between bank capital and the amount of loans that are paid and it is named as “capital adequacy ratio.” Capital adequacy is among the most crucial indicators that reflect the financial wellbeing of the banks that assures the shareholders and prevents bank bankruptcy and generally keeps banks alive. This indicator shows whether the bank has sufficient capital to absorb potential unforeseen losses¹⁴⁸.

Among the most crucial contemporary tasks in banking that assesses the degree of a bank's effectiveness and stability is capital adequacy ratio. An international norm for determining capital adequacy ratios is the Basel Capital Accord. The Accord suggests that banks adhere to minimum capital adequacy ratios. By lowering the likelihood of bank failure, using minimum capital adequacy ratios contributes to the steadiness and competence of the financial system. The regulators have worked to strengthen banks in the wake of the financial crisis. To do this, governments all across the industrialized world are putting pressure on their citizens to build up their balance sheets by raising capital, and if they are unable to do so, to reduce the quantity of risk assets (loans) that are shown on their books¹⁴⁹. Basel III, a global regulatory framework that, among other things, raises the minimum capital requirements from 4% to at least 7% of a bank's risk-weighted assets, was issued in 2010 by the central bankers of the globe, jointly represented by the Bank of International Settlements (BIS)¹⁵⁰.

The idea of capital adequacy predates the period of capital regulation in the banking industry, and there is a wealth of literature on the calculation of the capital adequacy ratio (CAR) and its factors¹⁵¹. Since the capital ratio was calculated by dividing total capital by total assets, the idea first emerged in the middle of the 1970s as lending operations in banks expanded without a

corresponding growth in capital. As a result, the global debt crisis intensified and one of the major American banks, Franklin National Bank, failed¹⁵². These incidents compelled regulatory authorities to emphasize control procedures more and to develop new standards and techniques for preventing bank insolvency¹⁵¹. All entities are often impacted by capital adequacy. However, as a phrase, it is most frequently used when talking about how businesses are doing in the financial sector of the economy, and more specifically, if they have enough capital to cover the risks they face¹²⁸.

A bank's capital adequacy, which is calculated as a percentage of its main capital to its (loans and investments), is a gauge of the health and stability of its finances¹⁵¹. Given that credit risk accounts for more than half of a bank's earnings in Nigeria, it would seem to be one of the major dangers that banks face. Therefore, in order for banks to be successful, they must provide loans, and in doing so, either particular risk considerations or market risk factors may discourage the borrower from fulfilling its duty to repay on time. Capital will be needed to absorb the resulting loss whenever this occurs. The bank's capital will be harmed during the cushioning procedure. Due to this, holding sufficient capital is required; hence, the term "capital adequacy". Therefore, capital adequacy refers to having sufficient capital to cover the risks to which banks are exposed.

Examining the connection between profitability and bank capitalization is the capital ratio. Since the capital ratio accurately depicts the overall stability of banks by depicting how effectively the bank is capitalized, it is frequently used to evaluate capital sufficiency¹⁵³. As a result, one of the fundamental indicators of capital strength is the equity to total assets ratio, or capital ratio, and the capital of banks is frequently used to assess their financial standing¹⁵⁴. For financial institutions to be able to withstand financial crises and strengthen depositor security under unsteady macroeconomic conditions, they must have a strong capital structure¹⁵³. According to a study,

well-capitalized banks have access to less expensive and risky financing sources so that the prudent behavior represented by high capital ratios is maintained in the loan portfolio, which boosts profit rates. As a result, banks with a fragile capital structure were unable to handle risky circumstances. Therefore, it is essential for financial institutions to maintain a stronger capital structure in order to absorb losses and reduce the bankruptcy risk during trying times¹⁵⁵.

Since lower capital ratios should result in higher bank revenues¹, some authors claim that the equity (capital) to assets ratio is adversely correlated with the total revenue dependent variable. An increased capital-to-assets ratio is thought to be related to reduce profitability in the banking sector. The risk of equity is typically reduced by a higher capital-to-assets ratio, which lowers the equilibrium expected return on equity demanded by investors. Additionally, a higher equity-to-assets ratio reduces the tax benefit afforded by the deductibility of interest payments, which lowers after-tax earnings. Additionally, a higher capital ratio may diminish profitability by lowering the value of access to federal deposit insurance, which at best imperfectly values risk. This is the case in the United States. Despite these defenses, the information on banks from the 1990s paints a totally different picture. Profitability and book values of capital-to-assets ratio have a positive link that is statistically and economically significant¹⁵⁶.

The positive capital-earnings relationship has a number of plausible reasons. By decreasing the anticipated expenses of financial difficulty, including bankruptcy, an increase in capital may boost predicted profitability. Additionally, if marginal earnings are not entirely distributed as dividends, an increase in earnings may cause the capital ratio to rise. If more capital lowers risk-related obstacles to entry or development into some successful product lines, a higher capital-to-assets ratio might also result in higher profitability. Banks may be better able to refrain from offering off-

balance-sheet guarantees, such as loan commitments and standby letters of credit, if they improve capital and lower their risks. Additionally, safer banks might find it simpler to borrow uninsured money to take advantage of emerging on-balance-sheet investment possibilities with high returns¹⁵⁷.

The capital adequacy ratio for banks is one of the most crucial measures of the financial sector's solvency and is regarded as a safety valve to safeguard depositors in order to support stability and effectiveness in the banking system and financial institutions. The legislation in the central banks of every nation in the world keeps an eye on this index of banks operating in their economies to ensure that the financial institutions can continue to function and that there is a strong and solid supply of money to cover any emergency requirements when there is pressure on the financial institutions or impending large withdrawals of deposits. There is an opposite relationship between high capital adequacy and level of profits; when this rate is high, the rate of profit fell, and vice versa. More so, it is a sign that helps us determine the level of skill banking management has in using financial assets to maximize future shareholder profits¹⁵⁸.

Less risk incentives and more capital would be desired when banks become inefficient, according to empirical research on the factors that determine the CAR ratio; that implied a positive relationship between risks and capital¹⁵⁹. Moreover, the researcher also ascertained the influences of a corporate sector's financial health on risk accepting ability and capital status. Additionally, the researcher classified the behaviors of the Spanish banks into two distinct groups when identifying the components linked with capital fluctuations after running two models, dubbed Market model and Regulatory model. By changing the independent variables such as bank size, liquidity premium, operating expenditures, variation of ROA and credit, and liquidity risks, the first group of banks that had reserved capital ratios higher than necessary ratio was able to obtain

a level of optimal capital structure¹⁶⁰. Additionally, the effects of different amounts of capital on other variables varied according to the circumstances of various banks.

The problem of adequate capital of a bank is more crucial especially in the light of the global financial meltdown where bail out measures is now being employed by the regulatory authorities to maintain the financial system afloat. In reality, the question of whether current capital levels are deemed sufficient for the rising levels of risk has been a topic of discussion between bankers and the regulatory authorities¹⁶¹. The benchmark used to measure a bank's capital adequacy is generally accepted to be the minimum capital adequacy ratio of 8% related to banks' credit set forth by the Basel Committee. This suggests that a bank need eight kobo in capital for every naira granted as credit. A bank is said to be undercapitalized if its ratio is lower. The capital adequacy of Nigerian banks has not been assessed empirically¹⁶¹.

Studies looked into whether the 1988 Basle Accord's need for 8% capital backing for loans to private businesses prompted banks to shift their holdings from such loans to government securities. Authors find proof that the Basle Accord's risk-based capital requirement had a large impact on the credit^{162,163,164}. Regardless of the criterion employed, a bank's capital is frequently examined to determine the state of its financial health¹⁶⁵. According to a study, the best performing banks have struggled to increase labor and capital productivity and have been successful in fortifying equity¹⁶⁶. Also, further studies agreed that well capitalized banks face lower need to external funding and lower bankruptcy and funding costs; and this advantages translates into profitability^{155,167,168}.

Therefore, Numerous studies contend that a bank will be less likely to collapse if it has more capital¹⁶⁹. The primary driver for capital regulation is the worry that banks may maintain less

capital than is socially optimal given their level of risk since market requirements do not account for the negative externalities brought on by bank default. In this scenario, an uncontrolled bank would use leverage and assume excessive portfolio risks in an effort to increase shareholder wealth at the price of deposit insurance^{170,171,172}. By making bank owners shoulder more of the losses, capital requirements can lower these moral hazard incentives and lower the value of the put option on deposit insurance. With more capital and less risk taking, the effect is clearly a decrease in the bank's default probability.

2.1.2.6 Liquidity Ratio

Liquidity in banks represents physical cash, bank balances with CBN and other banks, treasury bills/certificates and any other assets of a readily accessible bank converted to cash with minimum risk of loss¹⁷³. Liquidity is the degree of convertibility to cash or the easiness with which any asset can be changed to cash that is, sold at a fair market price¹⁷⁴. A financial system's ability to survive, expand, sustain itself, and operate well is largely dependent on liquidity and bank performance. Planning and implementing liquidity incorrectly can have an effect on banking operations and have long-term effects on the economy¹⁷⁵.

Liquidity is a gauge of how well an individual or organization has cash to meet immediate and short-term obligations, or assets that can be quickly converted to cash. Liquid assets are those that may be converted to cash quickly if needed to meet financial obligations, and for a monetary institution to remain viable, it must have enough cash assets to meet its short term obligations¹⁷⁶. Liquidity is view as the ability of the bank to meet periodic cash demand of customers and a measure of its strength and an assurance for depositors' confidence¹³⁷.

Another element that affects how well a bank performs is liquidity. By comparing the total number of loans to the total number of customer deposits, liquidity is defined as the bank's capacity to meet its obligations, primarily to depositors. Banks generate liquidity by giving borrowers illiquid loans while allowing depositors to quickly withdraw cash at par value¹⁷⁷. Liquidity depicts the ability of a bank to fulfill its short term obligation. It is a strong measure of banks' strength as liquid banks are able to fulfill their short-term maturing obligations and the withdrawal demand of depositors. Generally, two schools of thought exist on liquidity and profitability dynamics. The first school, which is the best popular, is the one that maintains that the connection amongst liquidity and profitability is tradeoff, implying that the pursuit of one will automatically take a toll on the other¹⁷⁸. By contrast, another school of thought has maintained that the two objectives can be achieved simultaneously¹⁷⁹.

The organization of corporate liquidity is one of the most critical areas in determining whether a firm will be profitable or not. The capacity of a company to meet all of its financial obligations without impairing business operations is referred to as liquidity. Lack of sufficient working cash makes it impossible for a business to function efficiently. In order to fulfill their short-term obligations, banks must maintain a decent portion of their assets in the form of cash due to the significance of liquidity. Profit is the bottom line or ultimate performance result showing the net effects of bank policies and activities in a financial year¹⁸⁰.

The profitability of banks is positively correlated with adequate liquidity levels. Customer deposit to total asset and total loan to customer deposit are the two financial ratios that are most frequently used to measure a bank's liquidity position⁶⁷. Other academics measure liquidity using different financial ratios. For instance, Malaysian banks' liquidity was assessed using the cash to

deposit ratio¹⁸¹. The study carried out in China and Malaysia, however, discovered no connection between bank performance and liquidity levels.

In line with Basel III, the liquidity exposure ratio, and liquidity risk monitoring tools were developed by the Basel Committee on Banking Supervision to ensure that banks are resilient and able to withstand market shocks for a period of 30 days¹⁸². This is accomplished by certifying that banks have an adequate supply of unencumbered high-quality liquid assets (HQLA) that can be quickly and readily converted into cash for use in a 30-day scenario of liquidity stress. Some banks struggled in the time of financial crisis of 2007–2008 as a result of violations of the fundamentals of managing liquidity risk. In response, the Committee released Principles for Sound Liquidity Risk Management and Supervision in 2008 as the cornerstone of its liquidity framework (Sound Principles).

Only if banks and supervisors fully follow the Sound Principles, which provide comprehensive guidance on risk management and supervision of financing liquidity risk, should assist to encourage improved risk management in this crucial sector. As a result, the Committee will maintain a close eye how supervisors are putting these guidelines into practice to make sure banks follow them. Thus, liquidity management is crucial to the financial health of banks in any nation and is associated with improved bank performance¹⁸².

Liquidity is a crucial factor in all businesses, including banks, just like loans and advances are. A bank without enough or the necessary cash and cash equivalents will be susceptible to liquidity crises, which is why the CBN is always concerned about the term "liquidity" in deposit money banks. A firm cannot always operate to flourish without liquid assets. Bank liquidity is the capacity of the bank to keep on hand enough cash to satisfy customers' needs at all times without

jeopardizing the CBN liquidity guidelines¹⁸³. In order to comply with current reserve standards, banks must be able to rapidly meet obligations for cash, checks, other withdrawals, and valid new loan demand. The total of reserve requirements imposed on banks by a monetary authority in Nigeria and other countries often used to define the liquidity requirements in the financial sector¹⁸³. Since the cash is either idle or used to create income, another question raised by this study is whether maintaining the statutory cash requirements have any discernible effect on the profitability of the banks.

When there are discrepancies in the amount and maturity of assets and obligations on the balance sheet, liquidity risk is present. Funding liquidity risk and market liquidity risk are the two main categories of liquidity risks. Funding liquidity risk is the possibility that the bank won't be able to meet both its immediate and long-term cash needs without having an adverse impact on its regular business operations and financial position. Market liquidity risk is the likelihood that a bank won't be able to quickly offset or get rid of a position without having a significant impact on the market price¹⁸⁴.

The ability of a bank to keep enough money on hand to cover its maturing obligations is known as liquidity. The capacity of the bank to rapidly satisfy obligations for cash, checks, other withdrawals, and valid new loan demand while adhering to existing reserve requirements¹¹⁸. Therefore, managing liquidity entails strategically supplying or withholding from the market or circulation an amount of liquidity that corresponds to a targeted level of short-term reserve money without impairing the bank's capacity to make money or operate normally. In order to establish its liquidity requirements and, consequently, the amount of liquidity to allocate or withdraw from the market, it depends on the daily evaluation of the liquidity position in the banking system¹⁸⁵. The

goal of a corporate organization, such as a bank, is to maximize profit in light of this. It is crucial to strike a balance between bank return and liquidity¹⁸⁶.

A bank's liquidity is its capacity to pay all of its debts as they become due. During the normal run of business, these could involve loans, investment commitments, deposit withdrawals, and liabilities maturities¹⁸⁷. The Bank for International Settlements (BIS) refers liquidity to a bank's capacity to finance asset growth and pay commitments as they become due without sustaining unacceptable losses¹⁸³. If a bank has enough liquid assets and cash on hand, as well as the ability to quickly raise money from other sources, it is said to be liquid and able to satisfy its financial commitments and payment obligations on time. A liquid asset is a cash-transferable asset, such as a security investment, which can be quickly sold for cash without causing the bank any losses. Banks are required to hold a specified amount of their deposits in primary reserves in an account with the central bank. These reserves are primarily used to settle interbank debt and serve as depositor's insurance.

Liquidity management is crucial for the outstanding performances of all business entities, particularly to financial institutions due to the fact that customer confidence of the banks is to a large extent dependent on the accessibility of funds in good time. Insufficient liquidity might hinder banks' ability to run well even if they are unable to promptly satisfy clients' financial needs. This would result to tight interaction with their clients, and so it is of vital importance to formulate policies for the efficiency of liquidity management. This could take the shape of appropriate course of action for the assessment, control, and management of liquidity¹⁸⁸.

Liquidity management entails maintaining sufficient cash and cash equivalent balances to cover customer obligations as they fall due and to ensure that funds are readily available for regular

business operations¹⁸⁹. A bank's liquidity management determines its capacity to satisfy the withdrawal requirements of its clients and other cash flows. Liquidity management is therefore crucial to corporate operations and, by extension, profitability¹⁹⁰. A business must maintain balance between its management of its profitability and its liquidity position, since inadequate liquidity and excess liquidity has a significant effect on firms' profit¹⁹¹. Liquidity operations in banks cannot be overemphasized.

Maintaining a sufficient cash balance and its associated balances is part of managing liquidity so that it may satisfy customers' needs whenever they arise. Making sure there is enough cash available to carry out the daily operations of the bank¹⁸⁹. Banks must be capable of generating a profit while performing these duties in order to benefit all of the stakeholders who are essential to their ongoing existence and operation. However, stabilizing liquidity and how it is managed is necessary for achieving profitability¹⁸⁹.

Liquidity management is another important decision that the managers of deposit money banks take and specifically to the measurement of their needs related to the process of deposits and loans. Since a lack of liquidity at one bank can have systemic effects, the importance of liquidity extends beyond the specific bank¹⁸⁹. It is argued that banks who maintain high liquidity do so at the expense of other investments that could yield high yields.¹⁸⁸

In an effort to strike a balance between the quantum of liquidity and returns, professionals and scholars have made various efforts to offer a solution to the difficult regarding the level of liquidity to hold. An optimal liquidity hypothesis holds that market responses to liquidity-changing events are conditioned by the observed changing levels of the firm's liquidity. The firm's value is affected by a variety of liquidity-enhancing situations or events, including

debt/equity issues, asset sales, and loans from interbank markets. The level of liquidity is impacted by the selection of any of these factors. To achieve the necessary tradeoff between liquidity and profitability, then, is the challenge in liquidity management¹⁹².

Profitability and liquidity are of important issues that administration of each commercial unit should notice and, ace them into account as their most important duties. Liquidity status is very important for investors and managers as it helps to evaluate a firm's future, estimate investment risk and return and stock price. Some thinkers believe that liquidity is more important because firms with low profitability or even without profitability can serve economy more than companies without liquidity¹⁹³. A study also, finds that there exists a helpful association between liquidity and corporate performance¹⁹². The ratio of success of corporate governance is positively related to firm's financial performance and liquidity in another study¹⁹³.

By noting that switching from short-term assets to long-term securities or loans boosts a bank's return but also increases its liquidity risks, as well as the opposite being true, we can see the trade-offs that typically exist between return and liquidity risk. So, a bank with a high liquidity ratio is less risky and less profitable¹⁹². Thus management is faced with the dilemma of liquidity and profitability. The negative impact of increased liquidity on financial institutions was also emphasized, with the statement that "more liquid assets increase the ability to raise cash on short notice, but they also reduce management's ability to commit credibly to an investment strategy that protects investors," which, in some cases, can result in a reduction of the "firm's capacity to raise external finance"¹⁹².

A study done in Nigeria on the effect of Liquidity on Nigerian bank financial performance: A dynamic panel approach concluded that banks liquidity is positive and driver of bank performance

in Nigeria. Liquidity, past performance, board size and debt structure are major factors of bank profitability as well but not only liquidity⁴³.

2.1.2.7 Size of the Bank

In the banking industry, bank size (Log of Total Assets) is typically used to measure possible economies of scale or diseconomies of scale. When economies of scale are taken into account, bank size significantly influences the prediction of financial performance. A bank can increase efficiency, capital base, and market share while leveraging average cost per unit reduction. As it absorbs unexpected losses, enhances banks' capital bases, and additionally uses retained earnings to reinvest in the business, the ability to sustain profits over time remains the first bank's line of defense.^{194,23,195,196}. However, according to some studies, the banking firm's size can be increased to reduce marginal costs, particularly when markets expand. Up to a certain point, an expanding bank's size may have a favorable effect on profitability. Beyond this limit, size may have a detrimental impact for bureaucratic and other factors^{197,198,199,13}. As a result, one can anticipate that the size-profitability relationship is non-linear²⁰⁰.

The cost of delegating (as a corporation grows, so does its hierarchical bureaucracy), so also the huge firm's growing inability to recreate the powerful incentives of the residual income of an owner entrepreneur, serve as the firm's size limiters. This is due in part to the fact that a large firm's existence is more secure and less dependent on the decisions of any one individual, as well as the fact that intervention rights from a firm's center typically come with some type of income insurance to make up for the reduced responsibility, which reduces incentives²⁰¹. Larger enterprises are found in wealthier nations or those with greater human capital averages. Thus, a positive correlation exist between firm size and economic development²⁰².

The size of a bank matters in terms of how profitable banks are. As it absorbs unexpected losses, increases banks capital base, and additionally used to enhance future performance by reinvestment of the retained earnings, the first bank's ability to sustain profits over time remains its principal line of defense^{203,204}. When economies of scale are taken into account, bank size significantly influences the prediction of financial performance. A bank can increase efficiency, capital base, and market share while leveraging average cost per unit reduction²⁰⁵. A larger bank is more effective in making strategic decisions and has greater sway over its stakeholders, rivals, and efficiency. It is also more profitable than a small bank²⁰⁶. The distinctiveness of a bank's size in terms of assets, capital, deposits, and loans has an impact on the caliber of judgments made on the activities that a bank undertakes, that in turn has an effect on the soundness of financial performance²⁰⁷.

In the banking industry, economies and diseconomies of scale are measured by a bank's size. The logarithm of a bank's total assets is used to calculate its size. When scale economies are taken into account, The size of the bank significantly influences the profitability estimate. A bank can increase efficiency, capital base, and market share while leveraging average cost per unit reduction. A larger bank is more effective in making strategic decisions since it has greater sway over its stakeholders, rivals, efficiency, and profitability in comparison to a smaller bank¹⁴¹. The uniqueness of a bank's size in terms of assets, capital, deposits, and loans has an effect on the quality of judgments made about the activities that a bank undertakes, which ultimately has an effect on the strength of financial performance²⁰⁶.

A bank's size can be broken down into two categories: vertical for activities and products, or horizontal for the distribution of a good or service among numerous companies. As a result, there is a perplexing, never-ending discussion over the ideal bank size, managerial complexity, and

exposures related to activity ranges. Larger banks participate increasingly in market operations that are apart from their regular lending, which has recently increased and expanded significantly²⁰⁴. The developed world's paradigm change in activity has called for restrictions to lessen bank size exposure. As a result, larger banks frequently engage in more market-based operations, have lower capital bases, and are more sophisticated than small banks²⁰⁷. However, failures of larger banks typically have a greater effect on the banking system than failures of smaller banks²⁰⁸.

The number of branches, capital base, number of client deposits, loans, and advances were utilized as the main factors in the study to determine the effect of bank size on the financial performance of Kenyan banks throughout the period of 2012 to 2016. A study shown that there is a correlation between bank size and financial performance, and larger banks have greater ROA than medium-sized and small banks²⁰⁹.

Economies and diseconomies of scale associated to size are accounted for by bank size as a company property. As a financial firm gets bigger, economies of scale develop (usually measured by its total sales). Due to increased efficiency and the distribution of a higher volume of output over the business's fixed costs, the cost of production per unit of output tends to decrease when a smaller firm evolves into a larger one^{210,211}. Larger banks appear to generate less profit than smaller ones, according to studies from Tunisia and Hong Kong. It demonstrates that banks with a significant retail deposit-taking network may not always enjoy a cost advantage^{212,213}.

The literature has employed bank size as a performance indicator. According to several other studies, bank size and access to capital are closely associated, and relatively large banks with a strong deposit base are more likely to raise capital from the public at a lower cost²¹⁴. Higher

capital is necessary for a bank to survive and function well, but the impact that capital has on a bank's size varies because having more capital, deposits, credits, or total assets does not guarantee that a bank will perform more profitably in the long run^{215,216}.

One of the crucial factors influencing how well DMBs operate is bank size. The bank's total assets function as a proxy for its size. Generally speaking, optimistic projections are made for the impact of bank size on profitability²¹⁷. The market share and power of a larger bank are greater in terms of clients and investment volume. The size of the bank is typically used to measure possible scale economies or diseconomies in the banking industry. Performance and bank size are strongly positively correlated²¹⁸. Additionally, the study's findings show that a bank's size has a favorable impact on its profitability²¹⁹

Bank size has an effect on its everyday operations²²⁰. The extent of risk that the bank's partners are exposed to is determined by its size, all other things being equal. Larger banks are more likely to get their debts returned than smaller banks since they have more resources to support themselves even during periods of economic crisis. It is determined that there is a direct correlation between a bank's size and its profits²²¹. Big banks are therefore extremely profitable since they lower the cost of generating capital.

A banking institution's performance is significantly influenced by its ability to attract new clients, keep existing ones, and manage its assets and liabilities to maximize profits. Furthermore, it has been argued that the size of the institution, asset management, operational efficiency, and capital adequacy are all elements that enhance a bank's financial performance^{216,222}. It is sufficient to state that banks that met the benchmark for the 2004 capital reform are not comparable in size to banks that did not, as mentioned by, in terms of assets and deposit liabilities²²³.

Larger banks are able to diversify their commercial operations, which lowers risks and enables them to function with less capital and less steady funding, which can improve their market activity. In comparison to other small banks, large banks are able to operate in a totally diverse market sector, giving them a competitive edge in market activities that may necessitate incurring fairly high fixed costs but with the confidence that the bank will experience economies of scale. Market-based activities may result in unstable funding and increasing leverage because securities may be used as collateral in repos²¹⁹.

Therefore, profitability is a function of both internal and external factors, including ownership, stock market development, market concentration, and other macroeconomic factors, as well as internal factors that are primarily subjective by a bank's management decisions and policy objectives, such as the level of liquidity, provisioning policy, capital adequacy, expense management, and bank size. However, banks with adequate capital make more money than those with inadequate capital²²⁴. Highly capitalized banks are less likely to experience insolvency and need less outside funding, particularly in emerging economies where it is challenging to obtain external borrowing. The size of each bank is determined in this study using a log of its total assets at the conclusion of the accounting year.

Whether bank size maximizes banks' earnings is one of the key questions explored in the literature. Numerous empirical findings supported the notion that size plays a role in determining bank profitability after the relationship between size and profitability was examined in some earlier studies. Different findings have been found after studying the literature on the connection between bank profitability and size. Size and profitability have been found to significantly positively correlate in the authors' earlier studies^{225,195,226}. Additionally, studies indicated that the size of the banks they looked into had a beneficial effect on their profitability^{227,228,14,229,230}. Prior

research on the effect of bank size on profitability primarily supported the notion that large banks can benefit from economies of scale that lower costs. Larger banks are more profitable than smaller ones, according to this efficiency theory, since economies of scale result in an increase in operational efficiency. By entering markets that small banks are unable to reach, large banks may also benefit from scope economies (lower risks and product diversification)^{193,23,231}.

Studies that looked at large banks' economies of scale also discovered diseconomies for them or economies of scale for smaller banks²³². Particularly, only the smallest banks in Europe showed economies of scale, while the biggest ones showed diseconomies of scale²³³. According to some academics, banks could cut expenses by growing in size, but on the other side, banks might have a wide range of inefficiencies. Smaller banks may therefore be more successful than larger ones²³⁴. These studies suggest that the size of large banks may suggest a negative association between size and profitability, which is brought on by management expenses for very large businesses, administrative overhead, and agency expenses^{235,14,228}. Additionally, several researches supported the idea that profits and bank size are negatively correlated, with larger banks achieving lower levels of profitability than smaller ones^{222,198,213}.

2.1.2.8 External Factors Affecting the Financial Performance of Deposit Money Banks in Nigeria

2.1.2.8.1 Inflation

Inflation is defined “as the rate at which prices generally increases”. Any nation wants to avoid inflation, and having high inflation is one of the biggest macroeconomic problems that a nation can encounter. Every nation on earth experiences inflation and the main culprit is thought to be the availability of money. It is generally agreed upon that controlling inflation is one of an

economy's key components. In recent years, inflation has become a problem that every government and nation must address²³⁶.

"Inflation is a financial phenomenon that occurs everywhere and constantly." The majority of economists, whether monetarists or Keynesians, agree with that statement. This claim argues that the ongoing expansion of the money supply is what has caused persistent inflation since the dawn of time. Persistent velocity growth or real income growth that is declining do not create inflation. It should be highlighted that a growth in inflation does not always indicate an economic failure, but rather when the nation fails to implement policies to lessen its negative effects. Inflation has a negative effect on every economy in the world²³⁷.

According to economists, inflation is a condition in a nation's economy where values of goods and services continuously increase over time. Because of this, each unit of currency buys less when the general price level rises, representing a decline in the purchasing power of capital and ultimately a loss of real value in the internal medium of exchange and unit of account in the economy²³⁸.

Another definition of inflation is a long-term, consistent rise in the cost of both goods and services. A technique for measuring and analyzing such movement is crucial for determining this price increase. The percentage rise in prices of any given data when likened to the same data from the previous year is how the rate of inflation is expressed. To determine how inflation affects an economy, price indices can be divided into three main categories. These include the GDP deflator, which is at times stated to as the Consumer Price Index (CPI), Whole Price Index (WPI), and Implicit Price Index (IPI)⁶¹. There is continuously the problem as to which method provides the best statistical approach towards the measurement of inflation. Conceptually, the Implicit

Price Index (the GDP Deflector) provides the best estimate of inflation because it is the only index that measures the overall price movement of goods and services in the country.

The equation is written thus:

$$\text{GDP Deflector} = \frac{\text{GDP at Current Price} \times 100}{\text{GDP at Constant price 1}}$$

GDP at Constant price 1

A persistent increase in the general level of prices is known as inflation. The opportunity cost of holding money rises due to inflation, which can deter saving and investment by creating uncertainty about future price increases. High inflation is sometimes linked to an excessive increase in the money supply. However, when the money supply increases in the same ratio as output, inflation is not always the result. However, moderate inflation rates may be attributed to shifts in the availability of supplies, such as during times of scarcity, or variations in the real demand for goods and services²³⁹.

Almost all of the economies in the world are infected by the inflation virus. It has been defined as what affects the consumer's wallet by devaluing their currency and occasionally acting as a hidden tax²⁴⁰. When one thinks about inflation, the dynamic scenario of ongoing price growth that resulting in a decrease in the real purchasing power of available currency immediately comes to mind. Cost push, demand pull, imported, creeping, salary push, mark-up, and profit push are all examples of inflation, which is characterized by an unceasing price spiral. As a result of too much money is being spent on too few products in an economy, there has been a persistent rise in the price of goods and services. It invariably happens when the total demand for goods and services

exceeds the whole supply, and it has the net impact of lowering the purchasing power of the currency unit.

Long-term price fluctuations appear to be affected by the money supply, as opposed to the short-term determination of inflation, which occurs when demand exceeds supply for a particular good or service²⁴¹. In addition to domestic variables like private consumption, government spending, interest rates, and money supply, external factors like foreign trade, technology transfer, and foreign direct investment also have a big impact on Malaysian inflation, which is much worse than the internal factors²⁴².

Inflation is a severe problem since it can lead to higher costs for goods and a decrease in the purchasing power of the currency in question when money is created. There is no country that is exempt from inflation, so when this decline in the purchasing power of money occurs gradually, as it did in Nigeria in the early 1960s, the situation was never concerning. The rate is the only variable that differs. The average annual rate of increase in prices is referred to as the inflation rate²⁴¹. Evidence has shown that nations with the highest rates of money growth, like Nigeria today, also have very high inflation rates. When inflation exceeds 1%, the economy is considered to be weak. In actuality, a high rate of inflation is only possible in the presence of a large amount of money supply. As a result, it is clear that inflation is a financial phenomenon. The entire economic system would be on the verge of collapse when variations in price levels reach "a runaway hyper-type-inflation," as has been the case in Nigeria since the early 1980s²⁴³.

A certain amount of inflation is therefore preferred to enable sustainable economic growth because it is not entirely terrible. Beyond that, it develops into a hydra-headed monster that has for years confounded monetary economics. When inflation reaches an unfavorable level, it

significantly impairs company performance and financial decision-making, creating a significant source of uncertainty in the global economy²⁴⁴.

Unpredictable inflation increases interest rates, reduces loan supply, and affects loan demand in banks, according to research on the effects of inflation uncertainty on credit markets. This shows that an increase in inflation may result in higher interest rates for bank loans and lower bank lending volumes²⁴⁵. Lenders raise interest rates to make up for the loss because they are well aware that inflation depreciates their currency throughout the course of a loan. Therefore, the higher interest rates can have an impact on how any DMB borrows. Even while it is unclear how much one influences the other over different time periods, this implies that there is a positive relationship between inflation rates and lending rates²⁴⁵.

The idea that inflation lowers the buying power of money is another. Lenders will demand higher interest rates on loans as a result of inflation and the belief that it will persist. This is due to the fact that lenders want to be rewarded for both giving up the use of their funds and taking a risk in lending, as well as for the anticipated loss of their funds' purchasing value over the course of the loan²⁴⁶. The ability of firms to accurately forecast changes in the relevant control variables will determine how much future changes in inflation are anticipated and, in turn, how much of an impact they will have on bank profitability. While an unexpected change may result in higher costs due to insufficient interest rate adjustment, an inflation rate that is fully anticipated will increase profits because banks can appropriately adjust interest rates to increase revenues. A positive correlation between inflation and long-term interest rates and bank capital and performance has been reported in several studies^{247,23,248}.

Bank business planning is typically disrupted by inflation. The uncertainty caused by the occurrence in both service prices and input costs that decreased expected investment spending makes budgeting challenging. In light of depositor withdrawals from the banking system, it worsens the loans policy, which has an impact on how well banks perform. The outcome is that a significant amount of the bank's profitability is decreased. In other words, it lessens the flow of loans and advances coming in and going out because banks could be reluctant to lend unless they can charge a higher interest rate, which deters the deficit spending unit from borrowing. The equity/shareholding performance of banks is also impacted by inflation, which lowers their equity capital and undermines the banks' long-term efficiency. This is due to the fact that real bank share prices are inversely correlated with both expected and unexpected inflation²⁴⁸.

The performance of the financial system is affected by inflation in a diversity of ways, including the shift of money from investors and savers to borrowers. The consequence is that the opportunity cost of keeping money could deter savings, which would have a bad impact on bank performance. To minimize the losses associated with diminishing purchasing power of money, investors would prefer to engage in non-inflationary capital projects. However, low savings will lower the amount of money that banks have available to them. Another effect of inflation is the deteriorating purchasing power of the currency over time, which has an impact on the central bank's exchange rate regime, worsens the economy's trade performance, and ultimately has an adverse impact on the balance of payments and drop in the exchange rate²⁴⁹.

The higher rate of inflation also has a negative impact on signing long-term financial agreements, as it lessens both the desire of lenders and borrowers to enter into agreements involving cash balances and the enthusiasm of intermediary financial institutions to provide long-term financing for the formation of physical capital. A fall in the ratio of the money supply to GDP, a key factor

in determining the success of the banking industry, occurs as a result of people and projects shifting money into actual goods as a result of rising inflation costs. On the other hand, increased inflation results in higher transaction and information costs, which makes it more difficult to achieve economic development²⁵⁰.

However, if the rate of inflation is unpredictable, banks may find it challenging to change their rate of return to account for the rising rate of inflation. Due to interest rate rigidity brought on by regulatory measures, inflation also has a negative impact on the real rate of return. Low returns may cause the financial sector to run out of money, which would reduce the amount of resources available for investments. As a result, there are fewer loans made by the financial sector, which results in an inefficient distribution of resources and subpar intermediary activity²⁵¹.

Macroeconomic factors including the interest rate, money supply, inflation, unemployment, and exchange rate directly affect how well the banking industry performs. The performance of the banking industry is heavily influenced by how much macroeconomic factors impact banks²⁵². Additionally, it was said that the performance of the banking industry and the wellbeing of the institutions were directly impacted by macroeconomic shocks, monetary policy schools of thought, political shocks, and international liquidity shocks²⁵³.

"If the bank's management fully anticipates the inflation rate, the bank can correctly modify interest rates to raise revenues more quickly than costs, which should have a beneficial influence on profitability"²⁵⁴. Inflation rate has a positive impact on banks' performance because banks manage their costs well under high inflation and a negative and significant relationship between banks' performance, according to studies. However, some studies also found that commercial banks' performance is unaffected by inflation^{255,256,257,258,259,260}.

As money moves from investors and savers to debtors, inflation has an impact on how well banks perform. As a result, the opportunity cost of holding currency in the future may deter savings, which will have an impact on how well banks perform. In order to avoid losses anticipated from the expected decline in the purchasing power of money, savers will prefer to invest in non-monetary capital projects, reducing the amount of savings that would be available to the banks. The fact that money loses purchasing power over time has an impact on the bank exchange rate regime, which in turn affects bank trade performance and further deters export, which results in a negative bank balance and a decline in the exchange rate²⁶¹.

Bank business planning is typically disrupted by inflation. The uncertainty caused by the occurrence in both service prices and input costs that decreased expected investment spending makes budgeting challenging. As a result of depositor withdrawals from the banking system, it worsens the loans policy, which has an impact on how well banks perform. As a result, a significant amount of the bank's profitability is decreased. In other words, it lessens the flow of loans and advances coming in and going out because banks could be reluctant to lend unless they can charge a higher interest rate, which deters the deficit spending unit from borrowing. The equity/shareholding performance of banks is also impacted by inflation, which lowers their equity capital and undermines the banks' long-term efficiency. This is due to the fact that real bank share prices are inversely correlated with both expected and unexpected inflation²⁶¹.

Several literatures have empirically examined the relationship between financial performance and inflation. When inflation rate rises in an economy, performance of banks and their lending reduces. In the long run it has a negative repercussion on trading volume of market equity²⁶². Study found that the relationship between banking sector and inflation was significant, negative and non-linear. It was affirmed the fact that the lending activities of banks decreases as a result of

a unit increase in inflation. This has adverse effect on the performance of the financial sector. It was further argued that prior to threshold level of inflation, the activities of lending by banks diminishes. The repercussion of the above assertion is the ineffective and inefficient allocation of resources in the financial sector²⁶³.

The impact of inflation on the performance of banks is a crucial issue. Inflation is considered to be very important in designing programme with the aim of achieving greater efficiency by lenders, managers, investors as well as shareholders²⁶⁴. The effects of inflation on the economy are diverse and can be both positive and negative. There is a threshold level of inflation below which inflation has a positive effect on financial depth, but above which the effect turns negative²⁶⁵. Increase in the rate of inflation could initially have negative consequences on financial sector performance through credit market frictions before affecting economic growth²⁶².

Studies emphasize the importance of threshold level of inflation in the relationship between inflation and financial sector performance. The negative consequence of inflation on financial sector efficiency becomes effective once the rate of inflation exceeds some threshold. These models further suggest another threshold over which additional increase of inflation will have no damaging impact on financial sector performance^{266,262}.

Many authors, who studied on the effect of inflation on banking performance found a positive and significant impact^{23,248,23,267,224,14,268,269}. However, some other studies have yielded an opposing result revealing that inflation has a negative effect on interest margins. They offer the following explanation: the main activity of trade banks is the granting of credit. The market therefore relies on a supply of credit (provided by the banks), and a request (that of the individuals and firms). Inflation would reduce the demand for credit, because it increases uncertainty on the future.

However, it was proven that individuals and companies are generally very light showers to the uncertainty (ambiguity-aversion). This fall in demand would involve a decrease of credits and therefore a go down of the performance²⁷⁰.

2.1.2.8.2 Foreign exchange (FOREX)

With the advent of international trade, foreign exchange was created. This results from various groups having various cultures and currencies. Human material existence is supported by external trade or international trade²⁷¹. Our daily operations, in which people, businesses, and governments all need some of foreign goods or services for various purposes, have proven that this assertion is accurate throughout history. An exchange rate is a tool used to calculate how much of a country's currency will be required to pay for goods and services that are sought from other nations.

The concept of foreign exchange, or FOREX, has been important to financial firms. Foreign currency serves as the financial component of business transactions that are carried out through the banks' payment and settlement systems, making international banking impossible without it. Therefore, according to the Business Dictionary, foreign exchange refers to both a system of trading in and converting the currency of one country into that of another as well as any currency other than the local currency that is used to settle international transactions. Additionally, regardless of whether the claim is in the currency of the debtor or the creditor, foreign exchange includes claims made by monetary authorities against foreigners in the form of bank deposits, treasury bills, short- and long-term government securities, and other claims operational in the event of a balance of payment deficit. This includes non-marketable claims resulting from inter-central bank and intergovernmental agreements. Since banks needed a significant amount of

foreign currency to conduct and settle their transactions, the foreign exchange market was said to have developed²⁷².

The value of one country's currency in terms of another country's currency, or the amount of units that one currency must buy to exchange for a specific number of units of another currency, is known as the exchange rate. It refers to the value of the Naira in Nigeria in comparison to other currencies including the US dollar, the pound sterling, and others. Nigeria's exchange rate has transitioned over time from a controlled to a deregulated regime²⁷³. The naira's exchange rate was largely constant between 1973 and 1979, during the height of the oil boom and at a time when agricultural products made up more than 70% of the country's GDP (GDP). When the government at federal level implemented its Structural Adjustment Policy (SAP) in 1986, the nation switched from a peg system to one with variable exchange rates²⁷⁴. Instead of the current system, when monetary officials regularly engage in the foreign exchange market in order to accomplish particular strategic objectives, exchange rates were exclusively decided by market forces²⁷⁵.

The exchange rate is a crucial macroeconomic factor that assess a nation's level of global competitiveness. It is also viewed as a determinant of how competitive a nation's currency is. Since foreign exchange income, commissions, and fees from foreign exchange operations have been regarded as a key revenue sources for banks, exchange rate trading is an important factor for banks²⁷⁶. A thorough analysis of banks' foreign exchange trading activity reveals that banks' primary source of income is rate volatility. Alternatively put, banks profit from the opportunity presented by exchange rate volatility so as to trade on exchange rates. Speculative actions will be encouraged by exchange rate volatility because of the likelihood that the exchange rate will increase. Sharp exchange rate changes may cause liquidity shortages and have a major impact on

the balance sheet dependent on the asset's currency denomination and maturity structure and obligations in the economy²⁷⁷.

It is frequently maintained that the behavior of various other macroeconomic variables depends on the behavior of the exchange rate. For instance, changes in exchange rates can have an impact on other economic health indicators like interest rates, inflation rates, unemployment rates, and term of trade²⁷⁸. Therefore, the exchange rate, which measures how strong a currency is relative to another currency or group of currencies, is both a tool for managing the macro-economy and a gauge of macroeconomic performance²⁷⁹.

The performance of banks has reportedly been significantly impacted by changes in foreign exchange rates. Additionally, the increase in the value of the dollar relative to different currency baskets will boost the profits of institutions with U.S. bases in the upcoming quarter. Furthermore, there is a sizable but unfavorable link between private domestic investment in Nigeria and floating foreign exchange²⁸⁰. A study found that Kenyan banks' profitability was unaffected by macroeconomic indicators such as real GDP, inflation, and currency rates²⁸¹.

While some research on the variables inducing the financial performance of deposit money banks in Sub-Saharan Africa and the US, respectively, indicated that macroeconomic factors like inflation and GDP significantly affect bank profitability^{282,283}. Additionally, additional studies demonstrated that the real GDP and inflation had negligible impact on bank profitability^{284,285,286}.

A significant, stationary model for the short- and long-term behavior of the exchange rate and its implications on bank foreign exchange profit was also demonstrated by other studies. However, the short-term effects outweigh the long-term effects. For this study, secondary data were used, and the Johansen and error correction models were applied²⁸⁷.

The performance of banks has allegedly been significantly impacted by changes in foreign exchange rates²⁸⁰. The future quarter's earnings of U.S.-based institutions will increase due to the increase in the value of the dollar with relation to various baskets of foreign currencies²⁸⁸. In addition, private domestic investment and floating foreign exchange have a considerable but unfavorable relationship in Nigeria²⁸⁹. However, a study indicated that Iran's profits were significantly influenced by exchange rates²⁷⁷. The study also found that the real GDP, inflation, and exchange rate had no impact on bank profitability in Kenya²⁸¹.

Exchange rate exposure was discussed in terms of transaction risk, translation risk, and broader economic risk. Transaction risk is the risk of changes in the value of committed future cash flows. Translation risk is the risk of changes in the value of assets and liabilities denominated in foreign currencies (which takes into account the impact of exchange rate variations on competitiveness). The article makes the case that domestic-currency invoicing and hedging with exchange rate derivatives allow for a relatively simple control of transaction and translation risk and examines when their use is ideal. A survey of actual hedging strategies and tactics used by multinational firms from a euro-area perspective is the paper's main novel feature. The study concludes that exporters in the euro zone have the tools they need to mitigate the negative effects of the euro's rise and that they use them to good use²⁹⁰.

Changes in exchange rates can benefit the business and increase profitability, but they can also have the opposite impact and severely reduce profit margins or even result in a loss. The exchange market has seen a consistent devaluation of the Naira (the currency of Nigeria). From 1997 to 2000, the US dollar to naira exchange rate was set at 21.8861; in 2001, it climbed to 92.6934. In 2006, the rate increased further to 133.504, but fell to 121.21 in 2008. The exchange rate grew to 127.7880 in 2009, fell to 118.5669 in 2011, and then increased to 148.9017 and 150.2980 in 2012

and 2013, respectively (CBN, 2013). In 2016, the currency rate rose further to N199.250, and it has continued to rise over since²⁹¹.

Both positive and negative effects of foreign exchange rate volatility can be seen in the financial performance of commercial banks. Commercial banks are impacted negatively when it results in losses that reduce bank profitability and favorably when it results in gains in foreign exchange that boost bank profitability. For commercial banks, the volatility of foreign exchange rates could be a significant source of risk. In the worst situation, significant foreign exchange losses brought on by fluctuating exchange rates may result in bank failure. Foreign exchange losses could have a significant negative effect on banks' financial performance, even in a modest scenario. Risk management experts, academicians, and central banks have long been deeply interested in monitoring banks' foreign exchange exposure as a result of serious implications for risk management and banking sector stability²⁹¹.

The correlation between foreign exchange transactions and banking sector financial performance is a hot topic in the literature and continues to be of interest to academics, economists, and decision-makers. Foreign exchange reforms that resulted in currency overvaluation and undervaluation due to currency differences among nations have been observed in a many countries throughout the world²⁹². Nigeria's foreign exchange supply comes from a different sources, and the country's financial managers must be nimble and resourceful to manage it effectively, expanding the horizons of the country's economy in the process. As a result, changes to the foreign exchange market have always had an impact on Nigeria's financial sector's overall reform trajectory²⁹².

Through the cost of loanable funds, exchange rates have an indirect effect on profitability by affecting interest rates. Increased value from trading foreign currency by commercial banks due to high exchange rates leads to more profitability²⁹³. High interest rates will enhance the interest income for commercial banks, but they will also result in lower demand for loans, which will diminish the increased interest income²⁹⁴. These unpredictable, indirect effects, which could have a significant effect on a bank's profitability, may be brought on by rules put in place for banks. The buy low and the sell-high phenomenon, among other things like commissions and interests from their operations, forms the basis of banks' revenue from foreign exchange rate transactions²⁹⁴. Exchange rates have a direct effect on the costs and/or profitability of traded and non-traded commodities, and as a result, they have a short- to medium-term impact on how resources are allocated²⁹⁵.

Exchange rates have a higher effect on a company's profitability if it receives foreign direct investment, and they can significantly increase risk and uncertainty when it comes to foreign investment²⁹⁶. Large foreign exchange losses brought on by changes in exchange rates pose a risk to banking institutions, could have a significant negative impact on their profitability, and even result in bank failure²⁹⁷.

Since domestic manufacturing costs are falling and international demand is increasing, exchange rate adjustment can help businesses remain competitive. Loans, deposits, and bank earnings all rise as a result. Additionally, because imported goods are more expensive at home, it may lower domestic consumer purchasing power, increase loan losses, and negatively impact bank performance^{298,299}. Studies back up the aforementioned conclusions, though they also prove the existence of significant correlation between exchange rate management and the performance of financial sectors, particularly banks, and that "unit increases in exchange rate are driven by an

increase in profit after tax"³⁰⁰. The effect of exchange rate regimes on banks' performance can be positive and negative, major or small ^{301,302,303}.

For banking organizations, foreign exchange movement may represent a significant source of risk. While moderate cases could result to bank's earnings to decline, significant foreign exchange fluctuations might also cause a bank to fail. Depository money banks and central banks have shown a great deal of interest in assessing banks' foreign exchange exposure because of the serious implications that foreign exchange movement could have on risk management³⁰⁴.

There is a positive correlation between bank size and foreign exchange exposure, that may be due to larger foreign exchange operations and trading positions of larger Chinese banks as well as their significant indirect foreign exchange exposure resulting from impacts of the exchange-rate movements on their customers. This relationship may also be resulting from the fact that larger Chinese banks have significant indirect foreign exchange exposure³⁰⁴.

Similar empirical research utilizing 22 significant U.S. commercial banks looked at the outcome of currency volatility on bank success. Large U.S. banks were shown to be vulnerable to foreign exchange risk, and profitability of individual banks was shown to be correlated with the dollar's value in relation to market baskets of other currencies. This outcome is significant because U.S. banks are not isolated from the current levels of worldwide economic activity despite the expanding global business climate²⁸⁸.

Real exchange rate (RER) cooling must be the goal of optimal exchange rate policy in order to keep an economy's internal and external balance. Internal balance is defined in this context as the amount of economic activity compatible with adequate management of inflation and resource utilization³⁰⁵. As opposed to that, external balance is described in terms of payment equilibrium,

sustainable current account deficit, and expected capital flow. Any variation in the real exchange rate will undoubtedly cause both the external and internal balances to become unstable³⁰⁵.

The frequency that the management strategies were deployed was determined by the monetary authorities' desire to stop the naira's ongoing depreciation and swings. Since 1986, a variety of market-determined exchange rate variations have been implemented in an effort to stabilize exchange rates and guarantee a single exchange rate for the naira³⁰⁶. In general, it would be expected that banks would be able to improve their performance through the large volume of foreign exchange they handle. However, this area is still unclear because some researchers believe that the exchange rate, which is a basis in determining macroeconomic variables, has little bearing on banks' performance²⁸⁰.

2.1.2.8.3 Financial Development (FINDEV)

One of the fundamental macroeconomic objectives in every country is the goal of sustainable development and economic growth. Financial progress in a country is typically linked with economic growth. This is highlighted by the possibility of better savings mobilization and allocation for development purposes offered by an operating financial arrangement, in addition to its part in economic reform³⁰⁷. To achieve this, more investment must be made in both human resources generally and in human resources specifically so as to convince and sustain economic growth and development. The goal of financial development is to increase financial sector efficiency while also promoting financial deepening and economic expansion.

Amongst the fundamental macroeconomic objectives in every country is the pursuit of economic growth and sustainable development. A country's scarce resources are much more likely to be used efficiently when the financial sector is well-organized. Economic growth may then reach its full

potential due to this. Furthermore, because financial intermediaries' main responsibility is to direct money to the most lucrative assets they find, effective financial markets raise the standard of investments, which eventually boosts economic growth. A thorough financial system could also enhance the effectiveness of financing choices, favor an improved distribution of resources, and ultimately speed up economic growth. Banks have an important part in linking savings and investments and are the most significant financial intermediaries in many different countries³⁰⁸.

One of the fundamental macroeconomic objectives in every country is the pursuit of economic growth and sustainable development. The performance of the Nigerian financial system has even been hampered by an inadequate lack of coordination and monetary and fiscal policy harmonization. Investors are less likely to use the banking sector because of the high cost of analyzing funds³⁰⁹. Obviously, the poor state of the financial sector's infrastructure use has also hampered the development of the financial sector in Nigeria. Power supply issues, telecommunications issues, including issues with internet connection, etc. are instances of infrastructure concerns that have raised operating costs³⁰⁹.

A well-developed banking industry should encourage sufficient fund mobilization from the economy's surplus to deficit sectors, reduce information asymmetry, transaction costs, agency costs, and monitoring costs, and on the whole promote good corporate governance, maximize the wealth of the shareholders, and assist as a major driver of the overall economy whether in developed or developing countries³¹⁰. A well-built financial system will encourage investment by spotting and funding lucrative business possibilities, enabling trading, mobilizing savings, risk hedging, and risk diversification, as well as facilitating the exchange of goods and services. All of them lead to a more effective distribution of resources, a quick buildup of human and physical capital, and they promote technical advancement, which in turn leads to economic growth³¹⁰.

Everything from banks, stock exchanges, and insurers to credit unions, microfinance organizations, and money lenders is included in the improvement of the financial system. Economic expansion is a direct effect of endogenous financial development. In order to increase output, Producers must look for effective money raising strategies. Meanwhile, consumers will seek out more effective strategies to increase the return on their savings, necessitating the need for a more well-organized financial market. As an economy grows, demand for all goods and services combined rises³¹¹.

The financial system creates a favorable environment for capital formation, economic growth and development, productive activity, financial intermediation, and payments system management³¹². However, the type and scope of the financial sector's innovations will show how much of an impact they have on the actual sector of the economy. These advances may pertain to the firmness of key market performance indicators, which are crucial to the process of financial intermediation, in the context of the financial sector. Key performance markers in these markets, for instance, can be used to gauge how stable the money, capital, and foreign currency markets are in relation to advances in the financial industry. All Share Index (ASI), banking system liquidity, and exchange rate volatility are examples of capital, money, and foreign exchange market indicators that are indicative of the level of financial sector innovation or development, which would then translate to an improvement in financial intermediation and, finally, economic growth³¹².

According to a study, a healthy financial sector promotes growth and profit incentives and aids in more effective risk management. By directing financial resources from surplus spending units to the most productive deficit spending units, a well-developed financial sector improves the process of financial intermediation and, as a result, economic growth³¹³. It is also a short-term occurrence because the rate of interest is gotten from the positive rate of profit connected with the operation

of creative productive activities. Interest is therefore charged from the surplus unit, where savings are made, and the deficit unit, where surpluses are directed³¹⁴.

The supply-leading and demand-following hypotheses describe the potential axes of interaction between the development of the financial industry and the economy. According to the supply-leading hypothesis, the establishment of financial institutions and markets increases the supply of financial services, which in turn indicates economic growth. This hypothesis hypothesizes that the expansion of the financial industry and economic growth are causally related. Financial intermediaries that are in operation can efficiently distribute scarce resources by sending them from surplus to deficit units, which stimulates the growth of other economic sectors³⁰⁸.

The demand-following hypothesis, in contrast, proposes a causal association between financial development and economic growth. The financial system is expanding as a result of the rising demand for financial services. Therefore, this hypothesis postulates that financial markets respond to strong economic growth-induced needs for financial instruments and arrangements^{315,316}.

Money market performance in many emerging nations, including Nigeria, has fallen behind in supplying cash to deficit investors, which has further impeded economic growth and development. In contrast to advanced economies, where the money market is the most important institution for generating liquidity for the government, businesses, and individuals, the money market in Nigeria is insufficient and constrained by a lack of sub-markets and the accessibility of satisfactory credit instruments³¹⁷. This was also buttressed by the argument that the market has not been successful in generating enough securities from corporations and institutions, and that the variety of securities accessible is insufficiently broad when compared to the quantity and value of assets that are available³¹⁸.

According to economic theory, capital markets and banks can be viewed as rival sources of funding because one sector develops at the detriment of the other. A specific quantity of money cannot be made available in the capital market if it is supplied through banks, and the opposite is also true^{319,320}. However, if businesses can find cheaper money on capital markets, they won't need to seek banks³²¹. However, especially when it comes to securitization, these intermediaries can possibly be seen as complimentary to one another. The capital market finances the borrowers after banks have first assessed the creditworthiness of the borrowing companies, reducing financing frictions. In consequence, the growth of the capital market lowers the cost of bank equity capital, allowing banks to raise the additional funds required to increase their lending activities and make riskier investments³²².

As a result, there is a "two-way nexus" between the banking sector and the capital market that should be recognized by researchers³²³. Study of the development of the stock market as a deciding factor in the performance of banks. They came to the conclusion that banks functioning in markets with a strong stock exchange had seen greater earnings than banks operating in markets with a weaker stock exchange³²⁴.

The financial performance of banks is significantly impacted by financial development, according to more research. The ratio of bank assets to GDP and the ratio of stock market capitalization to GDP are the two variables employed in the study to measure the financial structure and development. In line with the study, the stock market capitalization ratio has a favorable effect on bank performance while the bank assets ratio has a negative impact⁷¹. Another market structure variable that has been utilized in studies on bank financial performance is the bank concentration ratio. Lower spreads ought to result from increased fierce rivalry. Empirically,

however, it is challenging to identify a clear connection between direct competition measures and spreads^{325,326}.

The majority of research that looked at the significance of bank monitoring and screening in the development of the capital market found a favorable association. If banks are successful in realizing the creditworthiness of prospective borrowers, they should be able to offer and extend bank loans, which should encourage outside investors, mainly in the case of newly established borrowers^{327,328}. Furthermore, according to some sources, bank lending lowers the information costs related with accessing the equities and securities markets. Existing borrowing ties with banks would either cut the cost of external debt capital or reduce underpricing for businesses when conducting initial public offerings, supporting the idea that banking relationships are important in the pricing of corporate public debt^{329,330}.

It can be argued that increased bank efficiency will increase the efficiency of allocating funds to these borrowers by applying improved methods to determine the creditworthiness of borrowers. As a result, this might reduce financial friction. In addition, the growth of the capital market may reduce the cost of bank equity capital, allowing banks to raise the additional funds required to expand their lending and investment activities and, the outcome, potentially boost bank efficiency³³¹.

Prior research points to a connection between capital growth and bank effectiveness. Greater access to capital markets enables banks to improve both the efficacy of their investment management and the screening of prospective borrowers. Additionally, wider capital markets give banks the ability to manage their financial capital with comparatively less non-financial resources, which could lower their costs. Banks may require to deploy more non-financial resources to

manage and safeguard their financial capital since they aim to increase output and modify their financial capital position correspondingly^{332,333,334}.

Last but not least, signaling is more effective in larger capital markets, where investors have greater capacity for signal extraction and information provision, and the bank may save on the financial resources required to project a particular degree of reputation or risk safety. growth in the gross domestic product (GDP), a measure of economic activity, is thought help enhance the performance of the bank. A period of rapid growth brought on by an increase in investment and consumption boosts the creation of bank credit, which leads to better bank performance^{335,336,248,268,269,196}.

2.2 Theoretical Review

2.2.1 Buffer Theory of Capital Adequacy

According to the buffer theory, banks may want to keep a "buffer" of surplus capital in order to lessen the likelihood that they will fail to meet the legal capital requirements, particularly if their capital adequacy ratio is very volatile. According to the buffer theory, a bank that is close to reaching the required minimum capital ratio may be motivated to increase capital and lower risk in order to stay away from the legal penalties that would result from exceeding the capital requirements³³⁷.

The foundation of the buffer theory of capital adequacy is the capital adequacy ratio's volatility and the dependability and dependability of capital for long-term planning. A bank also runs the risk of having its capital base eroded if it is unable to mobilize enough deposits. Then, the bank can be in jeopardy as a result of fluctuation of the capital adequacy ratio. This protects against

persistent undercapitalization, which the regulatory authorities may punish with sanctions and possible closure because they view a breach of the capital requirements as a serious violation of banking legislation.

According to the buffer theory, a bank that advances the regulatory minimum capital ratio may be compelled to increase capital and lower risk to avoid regulatory penalties that would otherwise be accelerated by a capital requirement violation. A larger expected revenue, though, may tempt banks with little capital to take on more risk in the hopes that it will assist them increase their capital. This is among the ways that risks associated with insufficient capital have an impact on banking operations. In order to lessen the possibility of failing to meet the statutory capital requirements, banks may want to adopt a "buffer" of excess capital, especially if their capital sufficiency ratio is flexible³³⁷.

The buffer hypothesis postulates that banks approaching the legal minimum capital ratio may increase capital and decrease risk because they are concerned about the costs related to violating capital regulations²⁷⁴. Banks keep surplus capital for a number of reasons. First, the buffer serves as insurance for what a bank with inadequate capitalization becomes in the event of losing the public's trust and reputation. This buffer can be utilized as protection against the costs of unexpected loan losses (either by simple random shocks or asymmetry in information between the lender and the borrower) and the cost of raising new additional capital³³⁸.

Alternatively, shareholders may be reluctant to issue new capital to banks that may use the new capital to settle creditors obligations; as a result, such banks may be encouraged to take more risk in the hopes of enhancing their reputations through expected higher rates of return; secondly, because having buffer capital is linked to the banks' assets risk profile. Additionally, Banks with a significant degree of surplus capital would prefer to have a portfolio that is reasonably risky. over

minimum requirements than a lower level, otherwise they are more likely to record capital ratios below the minimum capital ratio; third, holding a buffer capital is considered by banks as the competition effect, so a bank may use excess capital. The buffer capital in excess of the regulatory minimum robustly dictates banks' risk taking behavior to regulators. In addition, banks may employ buffer capital as a strategy to prevent failure brought on by competition for unsecured deposits and money market funding. Due to this, a large majority of banks are particularly cautious regarding the amount of their own capital buffer as opposed to that of their rivals.

Additionally, banks may have surplus capital on hand so as to take advantage of unanticipated investment opportunities³³⁹. Based on the study, banks prefer to keep buffer capital to lessen the likelihood that they may fall short of the legal capital requirement, particularly if the capital adequacy ratio is highly variable. Additionally, poorly financed banks may be persuaded to take on more risk in the expectation that higher predicted profits may aid in raising capital. According to the hypothesis, a bank that is close to meeting the minimum capital requirement may be enticed to increase capital and lower risk so as to avoid the regulatory costs brought on by failing to meet the capital requirements³⁴⁰.

This hypothesis was flawed in that prudential bank supervision only has a limited ability to "watch banks continually," and, can only impose a limited set of harsh penalties on banks. These severe penalties, therefore, simply serve as a "incentive mechanism" to encourage banks to abide by capital regulations³³⁸. The study also refuted past research' claims that capital regulators have "strictly binding" authority over banks. Based on the study, prudential bank regulation can only influence banks' portfolio choices by lowering their "anticipated future cost on debt" and equity financing. The report included illustrations of how certain banks will change their portfolio option

of borrowing from major corporate organizations, including the OECD government bond, as opposed to disbursing loans to small and medium-sized businesses³⁴¹.

The theory encourages holding of extra capital, which makes it pertinent to this investigation. Increased financial performance is the ultimate result of excess capital since it lowers expenses, which otherwise could result in penalties for regulatory compliance violations. It also supports operations.

2.2.2 Modern Portfolio Theory

The 1952 Journal of Finance article "Portfolio Selection" established modern portfolio theory (MPT) or portfolio theory. This idea elaborated on how risk-averse investors should create portfolios to optimize or maximize anticipated return depending on a certain amount of market risk, highlighting that more reward comes with higher risk³⁴². Thus, diversification will assist an investor by lowering the riskiness of the portfolio while enhancing profits. The research emphasized further that when the number of companies in the portfolio rises, only "unsystematic risk," which is unique to particular stocks, could be eliminated³⁴³.

Based on this idea, risk-averse investors usually build their portfolios to maximize profits given the market dangers that are currently present. The notion stresses that great rewards cannot be separated from risks. Therefore, this diversification and lowering of the portfolio's riskiness are advantageous to an investor. According to modern portfolio theory, an effective frontier of an ideal portfolio may be created to give the maximum returns at the lowest risks²⁷⁹. As a result of the lower risks connected with a diversified portfolio, an investor is more likely to reap the rewards of portfolio diversification³⁴⁴. If the hazards of different stocks are not directly connected, the risk associated with investing in a varieties of individual stocks is lower than the

risk associated with owning a variety of equities that are comparable. Due to the fact that combining two hazardous assets may reduce the total risk of a portfolio, a portfolio that includes both assets must always be profitable regardless of the market conditions³⁴⁵.

Studies that support the idea have shown that banks have used it to diversify their loan portfolio in order to reduce unsystematic credit risk, which is defined as the danger of several borrowers defaulting on their debts in the same sector or location^{344,346}. Since history has shown that shocks may occur at some point without providing banks or firms the time to hedge or neutralize the position, the possibility of a rapid fall in an industry or geographic area cannot be overlooked. Therefore, it is in their best interests to ensure that the portfolio's concentration (across sectors, geographical areas, or even individual companies) is not too high^{344, 347}.

The optimal holding of each asset in a wealth holder's portfolio is a function of policy decisions determined by a number of factors, such as the vector of rates of return on all assets held in the portfolio, a vector of risks associated with the ownership of each financial asset, and the size of the portfolio, according to the Portfolio Balance Model of Asset Diversification. It suggests that bank management actions are what led to portfolio diversification and the desired portfolio composition of deposit money banks. Additionally, the ability to achieve maximum profits is dependent on the realistic asset mix that produces the high asset quality that management desires and the unit expenses of monitoring each asset component that achieves the desired performance³⁴⁸.

Our idea is relevant to this investigation because banks utilize it to diversify their loan portfolios in an effort to reduce unsystematic credit risk. It is impossible to dismiss the prospect of a sharp fall in loan portfolio in a particular sector or region since shocks might happen at any moment

without giving banks the time to prepare for them³⁴⁹. Therefore, banks make an effort to limit the portfolio's level of concentration across sectors, regions, or within particular companies.

2.2.3 Incentive – based Theory

The incentive-based theory is a theoretical justification that claims that maintaining banks' asset and liability portfolios steady whenever there is increased capital would naturally imply a better likelihood of performance. Studies that are pertinent have supported this theory^{350,351}. According to the research, capital either increases a bank's motivation to monitor its relationships with borrowers, lowers the possibility of non-payment, satisfies asset substitution, lowers moral hazard, or lessens the allure of riskier products.

The hypothesis is supported by empirical evidence from other research that show capital increases a bank's viable point in asset and liability market expressions, which also advances performance and continuous existence^{352,353}. Additionally, according to certain research, banks with stronger capital may compete more effectively for deposits and loans^{354,355,356}.

The study's detractors contend that prudential bank supervision only has a limited ability to "watch banks continually," and as a result, can only impose a limited set of harsh penalties on banks. These severe penalties, therefore, simply serve as a "incentive mechanism" to encourage banks to abide with capital regulations³³⁶. The report offered further arguments against past studies that claimed banks must abide by capital regulations "strictly." The study confirmed further that prudential bank supervision can only influence banks' portfolio choices by lowering their "expected future cost on debt" and equity financing, and it provided examples of how some banks will change their portfolio choices by borrowing from large corporate organizations like the OECD government bond rather than providing loans to small and medium-sized businesses³³⁶.

Another opponent of this said that because of the high fines and close market surveillance provided by the regulator, banks have an incentive to adhere rigorously to the regulations. The Basel standards, however, may become ineffective owing to information asymmetry and bank voluntary disclosure when economic conditions are deteriorating and the majority of banks are dealing with low solvency ratios, large numbers of defaulters, and liquidity constraints³⁵⁶.

Researchers have identified the impact of mandatory capital regulation on banks' performance in terms of increasing portfolio risk in some of their most important foundational publications. They also came to the conclusion that most banks would choose a riskier "portfolio of asset mix" before greater capital requirements are put in place. As a consequence, such bank behavior might undermine the goals of capital regulation and contribute to financial system instability^{357,358,359,360}.

The incentive-based hypothesis, however, does not distinguish between banks of various sizes. The size distribution of banks is important to strategy makers since size affects a bank's risk appetite, loan availability, and potential for economic force, much like capital, which is one of the criteria that provide information on bank performance.^{361,362}

2.3. Review of Empirical Studies

This section reviews the existing research on the connection between a deposit money bank's financial performance and its asset quality, capital sufficiency, and other factors in Nigeria and other nations. Although the findings of these studies, which were carried out in many nations, are varied, the majority of them have come to the conclusion that there is a positive correlation between the financial performance of Deposit Money Banks and their asset quality, capital adequacy, and liquidity. Banks with more capital perform better than their similarly capitalized competitors. These studies' authors employed a variety of approaches and a number of factors.

2.3.1. Asset Quality and financial Performance of Deposit Money Banks

A research looked at the linearity or nonlinearity of the connection between asset quality and financial performance using a worldwide dataset of 2,943 banks from both developed and developing nations. The U-shape test was employed in the study to look into if there was a nonlinear connection between asset quality and profitability. The nonlinear impact of profitability on nonperforming loans was investigated using the dynamic panel generalized method of moments (GMM) and quantile regression (NPLs). The outcomes demonstrated empirical proof of a nonlinear connection in the form of a U-shape. The study indicated that, after discriminating between advanced and emerging economies, the credit policy in advanced markets responds to changes in credit market circumstances more quickly than in emerging markets, offering insights into credit market dynamics.³⁶³

In support of liquidity and operational issues, a research looked at the effect of credit risk on the performance of five (5) listed Indonesian banks from 2009 to 2017. Data were evaluated using linear regression approaches for the variables of non-performing loans and return on assets, which served as proxies for credit risk and performance, respectively. The regression results revealed that credit risk has no effect on bank performance; this may be because the banks under study have an effective and efficient system in place for managing credit risk, which has kept default rates to a minimum. However, the findings revealed a negative correlation between performance and credit risk, which shows that a persistent increase in non-performing loans will have a negative effect on bank performance³⁶⁴.

The application of ratios as a measure of bank financial performance and asset quality was adopted in another study in an effort to examine and evaluate banks' asset quality and financial

performance in Kenya using secondary data sourced from the annual reports and accounts of the 11 Kenyan banks listed in the Nairobi Securities Exchange based on annual reports with a sample interval of six years from 2012 to 2017. The results revealed that the association between asset quality and bank financial performance was statistically significant³⁶⁵.

A study was conducted in Indonesia to find the effect of capital and asset quality on credit risk and profitability in both conventional and Islamic banks. In Indonesia, 115 banks make up the study's sample. The findings demonstrated that in both conventional and Islamic banks, assets quality has a positive and considerable impact on credit risk. However, in both types of banks, capital has no impact on credit risk. In traditional banks, asset quality has a favorable and considerable effect on profitability; nevertheless, in Islamic banks, it has the opposite impact. In conventional banks, capital has a favorable and considerable effect on profitability. Credit risk, meanwhile, has a negative and considerable impact on both institutions' profits³⁶⁶.

In a study, the effect of credit risk on the corporate financial performance of listed banks on Ghana stock exchange was investigated. In addition to estimating the effects of bank credit risk on corporate financial performance from 2003 to 2017, the study identified the variables that determine the level of bank credit risk. The study indicated that credit risk is negatively associated to variables like capital sufficiency, operating efficiency, profitability, and net interest margin, whereas factors like bank size and financing gap have a tendency to be favorably correlated with credit risk. Therefore, in line with the Basel Agreement, a rise in bank credit risk has a negative effect on company financial performance. The management should thus pay close attention to the exposure to credit risk³⁶⁸.

The effect of the loan-to-deposit ratio and non-performing loans on the financial performance of Indonesian banks from 2012 to 2016 was investigated. Both quantitative and descriptive research methods were used in the study. 116 banks made up the study's population, and a purposive sampling technique was employed to create a sample size of 13 banks for the time period under consideration. Return on assets was the dependent variable, while loan deposit ratio and non-performing loan were the independent factors. Size was employed as a moderating variable. The research gathered information from sample banks' public financial statements. The sample banks' data were gathered, and multiple regression using the absolute difference approach was used to analyze it. According to the results of the regression study, the loan-to-deposit ratio had a positive effect on return on assets, non-performing loans had a negative effect, and size had no moderating influence on the link between the two types of loans and return on assets³⁶⁹.

A research on the variables that affect Asian banks' profitability was attempted, with an emphasis on the significance of asset quality. using fixed effect estimate for the sample's panel data, which includes 947 banks from 12 Asian economies during the years of 2001 and 2015. The study discovered that the profitability of banks is significantly impacted negatively by poor asset quality (calculated as the ratio of impaired loans to gross loans). Additionally significant indicators are capital sufficiency, income diversification, and operational inefficiency, which are bank-specific factors. Real gross domestic product growth is the macroeconomic element that most significantly affects banks' performance³⁷⁰.

A research looked into how non-performing loans affected Turkish banks' bottom lines. For the period from the first quarter of 2005 to the third quarter of 2016, the study uses a panel regression approach to analyze the quarterly data set of 55 Turkish banks. It was discovered that non-performing loans and bank profitability, as determined by return on equity and return on asset,

had a strong, adverse connection. Poorer non-performing loans and greater asset quality result in higher return on equity and return on asset, whereas higher non-performing loans and lower asset quality result in lower return on equity and return on asset³⁷¹.

A research looked at whether non-performing loans in Turkey had an impact or not on a bank's profitability. The study uses a panel regression approach to analyze the quarterly data from 55 Turkish banks, which includes 1809 observations, from the first quarter of 2005 to the third quarter of 2016. The association between nonperforming loans and bank profitability, as determined by return on equity and return on assets, was shown to be considerable and negatively skewed. A larger percentage of non-performing loans results in poorer returns on equity and assets. Additionally, the fewer non-performing loans result in greater returns on equity and assets³⁷².

A time-series analysis that look on how credit volatility affected the state bank of India's profitability was carried out. Data on return on equity was gathered to assess performance, and credit risks were gauged using pertinent ratios including the capital adequacy ratio and the ratio of non-performing assets to total assets, among others. Using multiple regressions, the bank's financial statements for the twenty (20) years spanning 1997 to 2016 were examined. The outcome demonstrated that the performance of the single bank under study was only significantly and negatively impacted by the ratio of non-performing facilities to total assets³⁷³.

Chinese banks were the subject of a study that focused on their financial performance pertaining to the possible impact of credit risk. Based on the study, capital sufficiency significantly raised performance levels whereas non-performing loans had a negative impact on financial performance. However, neither the impaired loan reserve nor the loan impairment had a material

effect on financial performance. Overall, the result showed that credit risk had an impact on Chinese banks' financial performance³⁷⁴.

A research was done to determine how profitability responds relating to the impact of credit risk because of the listed commercial banks in Ghana's vulnerability to the negative effects of credit risk, particularly on their profit. Data for a loan to asset ratio, capital adequacy, loan loss provision, non-performing loan, and return on equity, the latter of which is a measure of profitability, were given by the Ghana Banking Survey and the financial reports of the banks. A statistical examination of the study's findings reveals a positive and substantial correlation between capital sufficiency and profitability. However, the individual effects of the loan-to-asset ratio, loan loss provisions, and non-performing loans were all significantly adversely correlated with profitability.³⁷⁵

An analysis of how capital requirements regulation affects bank operating efficiency in Tanzania discovered a strong negative and substantial relationship between loan loss reserve to gross loan and non-performing loan to gross loan on all profitability metrics. The capital adequacy ratio (CAR) has a negative and substantial impact on return on average equity, according to the investigation. The consequence is that credit management's impact on a bank's bottom line cannot be discounted.³⁷⁶

A research evaluating the financial performance of the banking sector in Ethiopia from 2009 to 2014 employed financial ratios and descriptive statistical analysis. The research result revealed that the financial performance of banks was highly impacted by profit margins and asset quality.³⁷⁷

The impact of banking risk on regional development banks in Indonesia was studied. The number of samples includes 26 Indonesian regional development banks for 2013–2015. Bank performance was represented by profitability, which was calculated as return on assets, but credit risk was represented by ratio of Non-Performing Loans (NPL), Net Interest Margin (NIM), the Loan-to-Deposit ratio (LDR), and the ratio of Operational Cost to Operational Income (OCOI/ BOPO). The results show that simultaneously, NPL, NIM, LDR, and OBOI/BOPO are significant to ROA; while NPLs are significant and negatively affect ROA, NIM is significant and positively affects ROA, LDR is not significant and negatively affects ROA, and OCOI/BOPO is significant and negatively affects ROA³⁷⁸.

For the years 2014 to 2016, a study looked at Indonesia's capital adequacy, loan to deposit ratio, operating costs, and return on equity. The population of the study, which used a quantitative research method, was made up of 43 banks, and a purposive sampling technique was used to create a sample size of 40 banks. The study used secondary data from sample banks' published financial statements for the studied period. Multiple regression analysis was employed to analyze the secondary data. Return on equity served as the dependent variable, whereas capital adequacy ratio, loan to deposit ratio, and operational costs served as the independent variables. The findings showed that the loan to deposit ratio and capital adequacy ratio had a positive and substantial link with return on equity³⁷⁹.

Using Return on Asset as a measure of profitability from 2006 to 2011, in a study, the association between asset quality and financial performance of private banks located in India was examined. The research examined the relationship between the asset quality of banks and operating performance using a variety of regression models. The study discovered a negative association

between banks operational performance, after adjusting for operating scale implications, and the ratios of poor assets, idle funds, and traditional banking industry concentration⁶⁴.

In a study, the factors influencing the financial performance of commercial banks in Ethiopia from 2007 to 2016 were looked at. Ex post facto research methodology and secondary data for eight commercial banks were used in their analysis. Return on asset and return on equity were chosen as the dependent variables for this study, while non-performing loans, capital adequacy ratio, bank size, leverage ratio, credit interest income ratio, loan loss provision ratio, and operational cost effectiveness were chosen as the independent variables. The investigation's conclusions showed that non-performing loans (NPLs), loan loss provision (LLP), leverage ratio (LR), and operational cost efficiency (OCE) have negative and statistically significant effects on banks' financial performance while capital adequacy ratio (CAR), credit interest income (CIR), and size of the bank (SIZE) have positive effects³⁸⁰.

For the years 2012 to 2016, a study on the impact of Indonesia's banking industry's financial performance on loan to deposit ratio and non-performing loans was carried out. Both quantitative and descriptive research methods were used in the study. 116 banks made up the study's population, and a purposive sampling technique was employed to create a sample size of 13 banks for the time period under consideration. Return on assets was the dependent variable, and loan deposit ratio and non-performing loan were the independent factors. Size was employed as a moderating variable. The study gathered information from sample banks' public financial statements. The sample banks' data were collected, and multiple regression using the absolute difference approach was used to analyze it. According to the results of the regression analysis, the loan to deposit ratio had a positive impact on return on assets, non-performing loans had a

negative impact, and size had no moderating influence on the relationship between the two types of loans and return on assets³⁸¹.

A study that compared a few important variables that affect the credit risks that commercial banks in emerging and industrialized nations face. They believed that multi-product and multi-service banking systems needed to be adequately controlled. For banks to continue performing their fundamental role of intermediation, they must have adequate liquidity³⁸².

The investigation looked at the impact of asset quality on the operational effectiveness of Nigerian banks (DMBs). All 15 of Nigeria's operating deposit money banks (DMBs) as of December 31, 2016, were the subject of a panel data collection that lasted ten years, from 2007 to 2016. Utilizing descriptive and inferential statistics, a quantitative research methodology was used to verify the accuracy and applicability of the findings. The panel data from the bank financial statements and Central Bank Statistical bulletins were analyzed using panel least square regression. The study's findings showed that asset quality significantly improves the operational effectiveness of Nigeria's deposit money banks³⁸³.

Utilizing secondary data from the accounts and annual reports of the 11 Kenyan banks listed on the Nairobi Securities Exchange based on annual reports with a sample interval of six years from 2012 to 2017, a study evaluated the asset quality and financial performance of Kenyan banks. Since ratios can be used to verify a firm's level of activity, the study adopted them as a gauge of bank financial performance and asset quality. The data were examined using the Pearson correlation and regression tool of the SPSS 23.0. The results showed that the association between asset quality and bank financial performance was statistically significant³⁸⁴.

For the years 2005 to 2016, a research looked at the effect of credit management on the financial performance of 10 listed deposit money banks in Nigeria. Using the capital adequacy ratio as a proxy for credit management and the non-performing loan to total loan ratio (NPLLR), the non-performing loan to total deposit ratio (NPLDR), return on asset (ROA), and return on equity (ROE) as a proxy for financial performance. The study's data estimate method was random effects generalized least squares (GLS) regression. The analysis discovered a substantial correlation between ROA and ROE and all three credit risk metrics³⁸⁵.

The Nigerian Deposit Insurance Corporation annual reports and accounts, the Central Bank of Nigeria's financial stability report, and the CBN statistical bulletin for various years were used to compile time series data for the study, which looked at the connection between asset quality and deposit money banks' performance during a thirty-year span from 1986 to 2016. The study's variables include return on asset (ROA), a proxy for Deposit Money Bank performance in Nigeria, non-performing loan to total loan ratio (NPL), liquid asset to total asset ratio (LAT), and liquid asset to short-term liability ratio (LAS), both of which serve as indicators of asset quality. The time series data in the study are analyzed using both descriptive and econometric approaches. The outcome demonstrates a short-term association between Nigerian deposit money bank performance and asset quality. Additionally, the cointegration result indicates a long-term association between asset quality and deposit money bank performance in Nigeria, and the granger causality result demonstrates a causal relationship between asset quality and deposit money bank performance in Nigeria³⁸⁶.

A research looked at the association between credit management and Deposit Money Banks' (DMBs') profitability (ROA) in Nigeria from 2006 to 2015. Multiple regression analysis was applied in the study to examine the information acquired using ordinary least squares. Based on

the study, non-performing loans have a negative but negligible effect on profitability, whereas loans and advances and loan loss provisions have a positive but insignificant impact. The study came to the conclusion that good credit management increases profitability and maintains the DMBs' financial stability³⁸⁷.

The annual reports of the listed banks with CBN and NDIC domicile served as the source of the data used in the study's research. The data was analyzed using regression methods, descriptive statistics, and unit root test statistical measurements. Based on the study's findings, throughout the 21-year period between 1994 and 2014, rising levels of poor loans and dubious loans had a detrimental impact on Nigerian banks' ability to function. Results specifically showed that substandard loans did not have a significant effect on return on capital employed with both having a negative relationship. However, bad loans and doubtful loans had a negative and significant impact on return on capital employed, which was used as a measure of bank performance³⁸⁸.

The effectiveness of Nigeria's deposit money banks was examined in a paper along with the effects of asset quality management. Utilizing annual aggregate data for the years 1990–2013 from the CBN and NDIC publications, the paper used the ECM and co-integration techniques. The study's conclusions show that the chosen asset quality measures significantly affect each of the three performance indicators for banks, namely return on equity, return on total assets, and return on shareholders' equity. Additionally, the outcomes of the impulse response and variance decomposition reveal that own shocks from the performance indicators ROE, ROTA, and ROSF account for a greater percentage of the variable forecast errors over the course of the ten-year forecast period³⁸⁹.

Five (5) Nigerian banks were the subject of a study to examine the connection between loan default and financial performance. Using the ordinary least squares regression approach, the five-year financial statements of these banks (2010–2014) were investigated. The regression result showed a positive and significant association between default loans and returns on assets. A negative association between loans and advances and returns on assets was also found in the study, at a significant level of 10%. It may be argued that the 10% threshold of relevance between loans and advances and performance (which is more than the 5% benchmark for the majority of social science studies) is insufficient to draw the conclusion that growing loans and advances cause falling returns on the assets of banks³⁹⁰.

According to a research, non-performing loans constitute a serious threat to the continued operation of deposit money banks in Nigeria and should not be understated since they have a detrimental impact on banks' performance. The research was conducted over a 14-year period, from 2000 to 2013, and the findings of the ratio and regression analysis led to the conclusion that banks performed poorly as the amount of non-performing loans rose, both in terms of return on assets and return on equity³⁹¹.

The ratio of nonperforming loans and bad debt does not significantly affect the performance of Nigerian banks, according to a study on credit management and bank performance of listed banks in Nigeria. While the ratio of secured to unsecured loans and the bank's performance were not noteworthy³⁹².

The fifteen (15) listed commercial banks in Nigeria from 1980 to 2013 were the subject of a study on the link between asset quality and profitability. The annual reports of the listed commercial banks were used as a source for secondary data. The data analysis approach employed was

multiple regressions with an econometric view statistical program. The short- and long-term relationships between the dependent and independent variables were examined using the Ordinary Least Square characteristics of the Augmented Dickey Fuller Test, Co-integration, and Granger Causality test. Based on the study, there is a strong correlation between asset quality and the profitability of deposit money banks³⁹³.

Using the SPSS regression approach, a study was conducted on the factors affecting the financial performance of a subset of Nigerian money-deposit banks between 2001 and 2010. Their research revealed a considerable association between financial performance and employee motivation, enough capital, and asset quality³⁹⁴.

A quantitative analysis of credit risk's impact on the performance of five deposit money banks in Nigeria from 2000 to 2010 was done empirically. As a consequence of the ratios of Non-Performing Loan to Loan and Advances (NPL/LA), Total Loan and Advances to Total Deposit (LA/TD), and Loan Loss Provision to Classified Loans (LLP/CL), profit is calculated using Return on Asset (ROA). The findings demonstrated that credit risk's effect on bank performance is cross-sectionally invariant and hence consistent across banks in Nigeria. Profitability (ROA) is reduced by around 6.2 percent for every one percent rise in non-performing loans, 0.65 percent for every one percent increase in loan loss provisions, and about 9.6 percent for every one percent increase in total loans and advances³⁹⁵.

In Indonesia, a study was conducted on the loan-to-deposit ratio, non-performing loans, and capital adequacy ratio on return on assets with excellent corporate governance from 2014 to 2018. Purposive sampling was used to select a sample size of 10 of the top banks for the study, which used a quantitative approach and a population of 45 banks. The outcome of the path analysis

showed that while the capital adequacy ratio exhibited a positive and substantial influence on excellent corporate governance, the loan deposit ratio and non-performing loans had a negative and significant impact. The second model claimed that non-performing loans, capital adequacy, and corporate governance all had a positive and significant impact on return on assets, while loan deposit ratio had no discernible effect³⁹⁶.

It was discovered in a research on the determinants of capital adequacy on the performance of Nigerian Banks. Each of the banks that were chosen for the study had their CAMEL ratios determined, and these were then compared to their capital bases. results indicate that ROA and loan to total assets are significantly associated with capital adequacy. However, the results found that non-performing loans and size are negatively associated with the capital adequacy. Our results do not support the association between macroeconomics variables and capital adequacy. The study does, however, show that the banking industry has stronger liquidity and capital adequacy the larger the capital base. Additionally, when the company's capital base expands, the return on assets does as well³⁹⁷.

A research was undertaken on the impact of capital adequacy on the financial performance of banks in Nigeria. A sample of ten (10) listed banks on the basis of size and availability of data were examined over the period 2010 to 2017, using descriptive statistics, and multivariate panel data estimation technique. The empirical results revealed that banks' capital adequacy ratio has a positive and significant impact on the financial performance of banks in Nigeria. Other variables found to be significant in the determination of the financial performance of banks in Nigeria are; bank size, bank loans and advances, debt ratio and growth rate of output. In order to absorb possible losses and safeguard the bank's debtors, banks are expected to maintain a level of capital that enables them to resist exposure to credit, market, and operational risks³⁹⁸.

A research examined the effect of bank specific (Bank Size ,Deposit to Asset Ratio, Loan to Asset Ratio, Loan to Deposit Ratio, Return on Asset, Return on Equity ,Loan Loss Provision) and macroeconomic determinants (Gross Domestic Product and Inflation) on capital adequacy ratio of Ethiopian Private Commercial Banks. In order to investigate these issues a quantitative method research approach is utilized, by using documentary analysis. More specifically, the study uses five years (2016 – 2020) data for fourteen private commercial banks in Ethiopia. The study used multiple linear regression models to determine the relative importance of each independent variable using OLS to estimate the relationship between CAR its determinants by STATA 13 econometric software. The findings show that bank size, return on equity ,loan to asset ratio affect capital adequacy ratio negatively whereas return on asset ,loan loss provision affect capital adequacy ratio positively³⁹⁹.

An examination of the determinants of commercial banks' profitability in Kosovo. Performance evaluation of commercial banks in Kosovo is done through measurement of financial performance indicators such as Return on Average Equity (ROAE), Return on Average Assets (ROAA) and Net Interest Margin (NIM). The study identifies the main factors that affect the profitability of commercial banks through analysis of financial time series and panel data of the banking sector in Kosovo. The study concludes that commercial banks profitability in Kosovo is driven mainly by internal determinant factors such as capital adequacy, asset quality and management efficiency, while macroeconomic factors have insignificant impact on financial performance of commercial banks⁴⁰⁰.

In a study, it was determined what variables impact commercial bank profitability in Jordan and how much the performance of commercial banks operating there is influenced by both internal and external aspects of businesses listed on the Amman Stock Exchange for Jordanian Banks

between 2007 and 2012. In addition to internal elements, the research also looked at external ones, including the macroeconomic and financial market structures. Based on the study, both internal and external factors have a substantial influence on ROA. All of the external elements in the models are found to be important, and the internal determinants of capital adequacy, liquidity ratio, and size. In the study, a third multivariate model that takes into account both internal and external variables was used. A major model was discovered⁴⁰¹.

Between 2005 and 2014, a research looked at the factors that affected profitability in Jordanian commercial banks. Their findings indicated that capital adequacy, capital, and leverage positively affected banks' profitability but there was a negative association between some banks' assets quality and profitability when using balanced panel data and ROA and ROE as indicators of bank profitability⁴⁰².

A research looked at the factors that specifically affected banks' profitability in Nigeria between 2000 and 2004. The goal of the study was to pinpoint crucial firm-level factors that affect bank profitability. Profitability was evaluated using Return on Assets. Regression findings showed that capital size, credit portfolio size, and ownership concentration are important company-level drivers of bank profitability in Nigeria using a panel data set with 91 observations of 33 banks over the 2000–2004 period. Insignificant factors include the size of deposit liabilities, labor productivity, IT status, ownership, control-ownership imbalance, and structural affiliation. Additionally, there is no solid evidence between bank risk and profitability⁸.

2.3.2. Capital Adequacy and financial Performance of Deposit Money Banks

In a study conducted between 2009 and 2015, the effects of capital adequacy and cost income ratio on the performance of 20 commercial banks in Nepal were evaluated. As dependent factors,

the study examined return on assets (ROA) and net interest margin (NIM), while independent variables included capital adequacy ratio, debt to equity ratio, cost income ratio, liquidity ratio, bank size, and equity capital to assets. The research showed a clear association between bank size and ROA, but other independent factors (capital adequacy ratio, debt to equity ratio, cost income ratio, liquid ratio, and equity capital to assets) had a negative correlation with ROA. This shows that, despite larger banks having better return on assets than the sampled banks, capital sufficiency, among other factors, had an adverse effect on the profitability of several banks in the nation⁴⁰³.

A research utilizing Return on Assets and Return on Equity as measures of profitability to analyze how these factors impact bank profitability looked at the credit risk and capital adequacy of the 567 rural banks in the Philippines. The study discovered that profitability and credit risk have a harmful and statistically significant link using the Arellano-Bond estimator. However, empirical investigation revealed that capital sufficiency has little to no bearing on the Philippines' rural banks' capacity to make a profit. Therefore, it is essential that rural banks carefully consider if a capital infusion will lead to greater profitability than rising indebtedness. The report also suggested that it is crucial for banks to recognize the risk variables that have the greatest bearing on their financial performance and to utilize better risk-adjusted performance assessment to underpin their plans⁴⁰⁴.

Between 2010 and 2014, a study used both qualitative and quantitative methods to examine the effect of capital on the financial performance of commercial banks in Kenya. The researchers used Pearson's Correlation Coefficient analysis to examine the link between the dependent and independent variables after extracting secondary data from the yearly audited financial reports of a few chosen banks for the time under consideration. The effect of capital factors on the financial

performance of a few Kenyan commercial banks was also examined using multiple regression. They showed that both Tier I and Tier II banks kept their core capital to total risk weighted assets ratio and their total capital to total risk weighted assets ratio at a level that was much greater than the established minimum requirements of 8% and 12%, respectively⁴⁰⁵.

A study sought to examine the determinants of financial performance of Microfinance banks in Kenya. The study adopted a descriptive research design and used secondary data from 7 Microfinance banks for a period of 5 years from 2011 to 2015. The data collected was analyzed using correlation and regression analysis. The study found a positive and statistically significant relationship between operational efficiency, capital adequacy, firm size and financial performance of microfinance banks in Kenya. However, the study found an insignificant negative relationship between liquidity risk, credit risk and financial performance of microfinance banks in Kenya. The study concluded that there is direct relationship between operational efficiency, capital adequacy, firm size and financial performance of microfinance banks in Kenya⁴⁰⁶.

A study investigated the effect of the CAMEL model variables on the profitability and financial soundness of the thirteen Jordanian commercial banks for the period of 2013 to 2019. The study uses CAMEL model variables of Capital adequacy, Asset Quality, Management efficiency, Earnings ability, and Liquidity management to rank banks as per their overall performance and measuring their effect on banks' profitability measures of Return on Assets and Return on Equity separately through applying the fixed effect regression model. The empirical results indicates that Non-Interest Income to Total Assets and Net Interest Income to Total Loans and Advances have significant positive relationships with both profitability measures whereas cost to Total Income and Non-Interest Income to Total Assets have strong negative relationships with the profitability measures. In addition, Equity to Total Assets has strong negative relationship with ROE⁴⁰⁷.

A study determined the effects of bank specific factors on the financial performance of commercial banks in Kenya for a period of 5 years, starting from the year 2011 to 2015. The dependent variable was return on assets (ROA). The independent variables were capital adequacy, asset quality, management efficiency, earnings ability and liquidity. The results showed that there was positive and significant association between ROA and all the independent factors. The results showed that there has been a significant decrease in capital adequacy during the five-year period. There was also a finding that asset quality affects profitability and the financial performance of banks. The study concludes that Asset quality of the bank have the highest influence on ROA of banks⁴⁰⁸.

A study aims to determine the factors that affect the Capital Adequacy Ratio and the performance of banks as well as the correlation between these two dependent variables. The study makes use of 128 observations made from 16 Vietnamese commercial banks between 2010 and 2017 and includes two concurrent dependent variables (CAR and ROE) as well as independent variables (return on assets, Tobin Q, credit growth, GDP growth, equity to deposits, loans to deposits, bank size, cost to income, liquidity risk, provision for loan loss ratio, non-performing loans, and inflation). The findings show that there is a statistically significant association between capital adequacy ratio and bank performance, and that two dependent variables are significantly impacted by credit growth, GDP growth, equity-to-deposit ratio, and cost-to-income ratio⁴⁰⁹.

An analysis of the impact of the following variables on return on assets (ROA) listed on the Indonesian Stock Exchange (IDX) from 2013 to 2017: capital adequacy ratio (CAR), loan to deposit ratio (LDR), non-performing loans (NPL), net interest margin (NIM), and operating expenses to operating income ratio (OEOI). 35 typical commercial banks that are listed in IDX make up the sample for the study. The F test result utilizing the Fixed Effect Model in Eviews

revealed that the variables CAR, LDR, NPL, NIM, and OEOI simultaneously affect RO, such as the Heteroscedasticity Test, in a substantial way. The results of the t test allow for the conclusion of a strong statistically significant positive relationship between NIM and ROA. On ROA, LDR has no bearing. While CAR, NPL, and OEOI significantly and negatively affect ROA⁴¹⁰.

In India, a research looked at what factors contributed to profitability in the private sector banks from 2006–07 to 2009–10. A sample of 23 private sector banks has been collected. To investigate how these characteristics affected the performance of the banks, backward stepwise regression analysis was utilized. Return on Assets (ROA) has been chosen as the dependent variable, and the study's other variables—including Spread ratio, Provisions and contingencies, Non-Interest Income, Credit/Deposit Ratio, Operating Expense Ratio, Profit per Employee, Business Per Employee, Investment/Deposit Ratio, Capital Adequacy Ratio, Non-Performing Assets, and Type of Bank—have been controlled. The findings showed that non-interest income, operating expense ratio, profit per employee, spread ratio, provisions and contingencies, non-interest income, provisions and contingencies, investment/deposit ratio, and non-performing assets are significant variables influencing the profitability of banks in the private sector of the Indian economy. Additionally, it is said that if banks focused on these factors, they would be able to increase profitability in the current globalized period³²⁷.

In 15 EU nations between 1995 and 2001, a research found a strong and favorable correlation between capital adequacy and profitability in the operations of local and international commercial banks. They determined that the main contributors to profitability in both local and international banks in these nations were bank-specific characteristics. They specifically demonstrate how variables such as adequate capital, credit risk, bank size, and liquidity greatly impacted the profitability of particular banks¹⁴.

In a research, the effects of bank characteristics, macroeconomic factors, and the structure of the financial markets were examined in relation to banks' net interest margins and returns on average assets (ROAA) in the UK commercial banking sector from 1995 to 2002. The findings demonstrated that capital strength is one of the key factors influencing UK banks' performance, supporting the claim that banks with strong capital positions are less likely to fail, which lowers their funding costs, or that they require less outside funding, which boosts profitability⁴¹⁰.

An investigation on the profitability and capital sufficiency of Kenya's commercial banks was conducted there. All Kenyan commercial banks with operating licenses during the past six years, between 2004 and 2009, were included in the study's population. Return on assets (ROA) and return on equity (ROE) were utilized as profitability indicators, while the capital assets ratio was used as a gauge of capital adequacy (CAR). The association between the dependent variables, such as ROE, and the variable ROA was determined by an empirical study and regression model. The study's conclusions showed that the association between ROA and capital is minor⁴¹¹.

The effect of capital sufficiency on the financial performance of listed deposit money banks in Nigeria was investigated in a research conducted in Nigeria. Data were gathered from the financial statements of five DMBs that were randomly chosen for the years 2010 to 2019 as the study used ex post facto methodology, producing a total of 50 year end observations. To find the descriptive, correlational, and regression statistics, the data were evaluated. The study's findings suggest that shareholders' equity and loans and advances have a favorable and substantial relationship with financial success. The study also found a negative and substantial correlation between client deposits and financial performance and came to the conclusion that listed Nigerian deposit money banks perform better financially when they have enough capital in place⁴¹².

A research also looks at the relationship between the financial performance of Nigeria's deposit money banks (DMBs) and their capital sufficiency. The eight (8) deposit money banks listed on the Nigerian Stock Exchange that have international authorization were all audited to acquire secondary data covering the years 2012 through 2019. Panel regression analysis was used to analyze the data. The findings demonstrated that advances and loans (LAD) have a favorable and significant impact on the financial performance of DMBs in Nigeria with international authorization. The study found a favorable association between capital sufficiency and the financial performance of DMBs in Nigeria⁴¹³.

The effect of CAMEL components on the profitability of Nigerian banks from 2001 to 2010 was assessed through a research. The model for the study was estimated using the statistical package for social sciences' (SPSS) Ordinary Least Square (OLS) approach. The Return on Assets (ROA) profitability ratio was employed as the dependent variable, with the ratios of the CAMEL system serving as the independent variables. The study's findings, which were based on the CAMEL model, showed that only the banks' liquidity was significantly correlated with their profitability, as opposed to capital sufficiency, asset quality, managerial effectiveness, and earnings⁴¹⁴.

A research looked into how Nigerian commercial banks performed in relation to capital adequacy standards. The NDIC and CBN Annual and Bank Supervision Reports provided the secondary time series data used in the study. The analysis of the study's results using the Ordinary Least Squares (OLS) regression approach. Their study's conclusions demonstrated the considerable impact capital sufficiency has on the dependent variable, Return on Asset (ROA), which gauges bank performance. The outcomes also demonstrated that adequate capital has a favorable influence on Nigerian commercial banks' financial performance. This suggests that having enough

capital stimulates, strengthens, and expands the financial performance of commercial banks, and that having enough capital plus good management can result in better performance⁴¹⁵

A research used panel data of 14 listed banks taken from the Nigerian Stock Exchange to evaluate internal variables impacting the profitability of Deposit Money Banks (DMBs) in Nigeria for the years 2008 to 2016. Profitability was proxied by Return on Assets, whereas Capital Adequacy, Credit Risk, and Inflation were used to represent the independent variables (ROA). The study used a correlational research approach to examine the factors that affect deposit money banks' profitability. To investigate the effect of internal variables on the profitability of the sampled listed Deposit Money Banks, panel data techniques (fixed and random effects model) were used. Feasible Generalized Least Square (FGLS) was utilized in the study to support the results of the Hausman specification test, despite the fact that the fixed effect model was identified as being more appropriate by the Hausman specification test. The study discovered that across the study period, internal variables had a considerable effect on the profitability of deposit money institutions. During the research period, Capital Adequacy had a substantial and positive link with bank profitability, but Credit Risk showed a significant and negative association with bank profitability⁴¹⁶.

A study focused on a few chosen quoted Deposit Money Banks in Nigeria between 2010 and 2015 to determine the impact of capital adequacy on financial performance. Secondary data from fact books, yearly reports, and the accounts of the Deposit Money Banks under examination were used in this study. Return on assets (ROA), return on equity (ROE), and return on capital employed were the primary metrics used to assess financial success (ROCE). The Pearson Coefficient of Correlation, Multiple Regression Analysis, Variance Inflation Factors, Multicollinearity, Heteroskedasticity Test, and Hausman Test were used to do statistical analysis

on the data. According to the study's findings, capital adequacy and financial performance are positively and significantly correlated. Additionally, empirical evidence showed that, at a 5% level of significance, Capital Adequacy has a statistically significant impact on the financial performance of deposit money banks⁴¹⁷.

In Nigeria, between 2001 and 2014, a research empirically examined the link between bank capital adequacy and return on assets. Using the Phillip-Perron unit root test, descriptive statistics and correlation tests were conducted to determine the strength of the variables' relationship. It was found that all the variables were stationary at their first differences. The study then used the Johansen Cointegration test and the Error Correction Model (ECM). The study found a substantial long-term positive association between capital adequacy and return on assets of Nigerian banks throughout the study period⁴¹⁸.

Applying the feasible GLS estimator approach to the pooled panel model for the years 2007 to 2015, a study looked at how much the capital adequacy ratio affected the financial actions of Nigerian banks. The correlation analysis revealed that capital adequacy ratio is favorably correlated with deposit money banks' profit after tax as well as return on assets, whereas management effectiveness and inflation are adversely correlated with both returns on assets and banks' profit after tax. According to the research, variations in capital adequacy ratio and liquidity were mostly responsible for variations in bank performance as evaluated by return on assets and profitability after tax payments. The variance brought on by management effectiveness and inflation, however, does not significantly boost bank performance in Nigeria⁴¹⁹.

A study evaluated the influence of financing mix on the performance of commercial banks, and the causal link between debt-equity ratio. Data collated were analyzed using correlation analysis,

pooled OLS regression analysis, fixed effect panel analysis, random effect panel analysis, granger causality analysis, as well as post estimation test such as restricted f-test of heterogeneity and Hausman test. The findings show that while debt finance exert negative and significant impact on return on asset, the debt-equity ratio has positive and significant influence on return on equity. There was neither unidirectional nor bidirectional relationship between capital structure and performance of commercial banks in Nigeria⁴²⁰.

In a research, the effect of capital adequacy ratio on the performance of listed commercial banks in Nigeria proxied by return on capital employed from 2014-2019. Data for the study was collected from the sampled commercial banks annual financial reports for the period covered, were analysed using panel regression. The study found that capital adequacy ratio had significant and positive effect on return on capital employed of listed commercial banks in Nigeria⁴²¹.

In a research, examined internal factors affecting profitability of Deposit Money Banks (DMBs) in Nigeria for the period of 2008-2016 using panel data of 14 listed banks drawn from the Nigerian Stock Exchange. Secondary data obtained from the listed Deposit Money Banks' financial statements were analyzed. The independent variables were proxied by Capital Adequacy, Credit Risk, and Inflation while profitability was proxied by Return on Assets (ROA). The study adopts correlational research design to investigate the determinants of profitability of the Deposit Money Banks. Panel data techniques (fixed and random effects model) were employed to examine the effect of internal factors on profitability of the sampled listed Deposit Money Banks. The study found that internal factors had significantly influenced the deposit money banks' profitability over the study period. The Capital Adequacy had a positive and significant

relationship with bank profitability while Credit Risk had a negative and significant relationship with bank profitability during the study period⁴²².

A research looked at the importance of capital in the Nigerian banking industry. The numerical estimates of the coefficients in various equations in the study were obtained using the pooled ordinary Least Square (Pooled OLS) approach. First Bank of Nigeria Plc, United Bank for Africa, Guaranty Trust Bank Plc, Zenith Bank Nigeria Plc, and First City Monument Bank Plc were the primary sources of the data, as well as their annual reports and statements of accounts. They discovered that capital level has a strong but indirect association with profitability, growth, and bank risk. The study's findings also showed that, between the years of 2006 and 2010, tangible assets, growth, business risk, and tax charges were the primary determinant factors that contributed to the bank leverage level of the Nigerian banking industry. All of these factors were consistent with theoretical predictions⁴²³.

Using the ordinary least squares (OLS) estimation technique, a study that looked into how the adoption of the Capital Adequacy Standards would affect the performance of Nigerian banks examined the relationship between the independent variables loans and advances, shareholders' funds, total assets, and customer deposits on the dependent variables earnings per share (EPS) and profit after tax. The analysis's findings indicated a strong positive association between capital adequacy criteria and bank performance. The execution of the Basle agreement framework was also discovered to enhance the influence of the Nigerian Monetary Authority on the new capital requirements⁴²⁴.

A study investigated the impact of credit risk management on the performance of deposit money banks in Nigeria using five banks that had highest asset base. Ex-post facto research design was

adopted using dataset for the period 2000–2014 collated from the annual reports and financial statement of the selected deposit money banks. Three hypotheses were proposed and tested using ordinary least square regression model. The findings reveal that credit risk management had a positive and significant impact on total loans and advances, the return on asset and return on equity of the deposit money banks⁴²⁵.

Between 2007 and 2017, a research looked at the effect of capital sufficiency on bank financial performance in Nigeria. In the study, data set of ten leading banks of Nigeria from 2007 to 2017. Our results indicate that ROA and loan to total assets are significantly associated with capital adequacy. However, we found that nonperforming loans and size are negatively associated with the capital adequacy. The results do not support the association between macroeconomics variables and capital adequacy. panel data techniques were employed in estimate⁴²⁶.

More empirical data on the effect of control and micro factors, as well as the capital adequacy ratio, on the financial stability of commercial banks in emerging markets like Vietnam is provided by a research. Using the Generalized method of moments (GMM) model, the study examines the effect of the capital adequacy ratio on the financial stability of 18 Vietnamese commercial banks between 2010 and 2020. According to empirical research findings, the capital adequacy ratio and the financial stability of Vietnamese commercial banks throughout the study period are positively correlated⁴²⁷.

A research looked at how the capital adequacy conditionality affected the performance of a few particular institutions in the Nigerian banking industry. The study used primarily secondary data that was gathered from the Central Bank of Nigeria's publications throughout a ten-year period (1999-2008). While Augmented Dickey Fuller (ADF) was used to verify the stability of the time

series data collected, Ordinary Least Square (OLS) estimate was modified to investigate relationships between the variables. The results indicated that the capital adequacy ratio (CAR) of the Nigerian banking industry was not greatly influenced by any of the performance measures studied, including returns on assets, returns on capital employed, and efficiency ratios, among others.⁴²⁸.

2.3.3. Liquidity Ratio and financial Performance of Deposit Money Banks

A research from Botswana examined the connection between liquidity management and the financial results of the country's commercial banks. From 2011 to 2019, data for the study was gathered from each of Botswana's nine commercial banks. To evaluate the data, the study used descriptive statistics, correlation, and regression. Based on the research, there are both substantial and minor correlations between financial success and liquidity management⁴²⁹

In a comparable research from Zimbabwe, it was determined what impact liquidity management had on banks' financial performance during a recession. The five top banks in Zimbabwe were used as a sample in the study. The research found a significant positive correlation between Zimbabwean bank financial performance and liquidity management⁴³⁰.

A study of the liquidity management variables influencing the financial performance of commercial banks in Mogadishu, Somalia, was done. 112 workers of commercial banks in Mogadishu were the study's target group, and 87 respondents were chosen for the sample size using Slog Van's algorithm. Based on the report, Mogadishu, Somalia's commercial banks' financial performance is highly impacted by liquidity management⁴³¹.

A research study the effect of managerial ownership, institutional ownership, company growth, liquidity and profitability on value 65 manufacturing companies in the Indonesian Stock Exchange in the 2015- 2017 period. The results of the analysis show that: Managerial ownership and profitability affect the value of the company while institutional ownership, company growth, and liquidity do not affect the value of the company ⁴³².

A Kenyan researcher looked at the effect of liquidity on financial performance of 64 listed firms in the Nairobi securities exchange Secondary data extracted from the financial statements was used to compute the relevant ratios and encompassed panel data. The study employed a dynamic panel data regression model while ANOVA was used to test the relationship between the variables across the sectors. Test of hypothesis was done at 95% confidence interval. The study found out that there was a positive and significant relationship between liquidity and financial performance of financial and non-financial firms⁴³³.

Examined in Kenya was how liquidity affected the financial performance of financial firms listed on the Nairobi Stock Exchange. The results of the study showed that one of the elements influencing the financial performance of companies listed on the Nairobi Securities Exchange is liquidity. Based on the study, there is a negative correlation between return on assets and liquidity, which means that financial organizations listed on the NSE would perform financially worse as liquidity declines. Deposit money banks should not skimp on liquidity management for the success of financial institutions. To fulfill their financial commitments, they must have appropriate liquidity levels⁴³⁴.

In Nigeria, a research looked at how liquidity management affected deposit money banks' financial performance over the course of ten years, from 2011 to 2020. Secondary data from the

annual reports of deposit money banks listed on the Nigerian Stock Exchange was applied in the study. The research measured financial performance using return on asset, return on equity, and net profit margin. As proxies for managing liquidity, the liquidity ratio, loan to deposit ratio, cash reserve ratio, and deposit rate were employed. All 22 of Nigeria's legal deposit money banks made up the research population. Using purposive selection, a sample of seven of these institutions was selected. The research design applied in the study was ex post facto. The association between the variables was determined using the panel least squares regression technique. The results demonstrate that liquidity management affects deposit money banks' financial performance in Nigeria in a positive and substantial way⁴³⁵.

Additionally, a research looked at the influence of liquidity management on the financial success of Nigerian banks from 2010 to 2018. Data from five deposit money banks that are listed on the Nigeria Stock Exchange were used in the study. Liquidity ratio, Loan to deposit ratio, Cash reserve ratio, and Deposit ratio were the variables used to measure liquidity management, while Return on Assets, Return on Equity, and Return on Net Interest Margin were used as proxies for financial success. According to the study's findings, liquidity management significantly affects the financial performance of Nigeria's deposit money banks⁴³⁶.

Further study in Nigeria looked at whether liquidity affects banks' profitability. The Central Bank of Nigeria statistics bulletin served as the data source. The analysis' findings indicated that there are both positive and negative relationships between bank profitability in Nigeria and liquidity. The research also recommended that banks hire experienced individuals to help them make the best judgments possible on the proper degree of liquidity⁴³⁷.

A research looked at the liquidity management and performance of a few Nigerian listed deposit banks. Out of the 17 deposit money banks listed on the Nigerian Stock Exchange (NSE) between 2012 and 2017, secondary data were taken from the financial statements of 15 of them (six years). It was done using a descriptive research design. The ordinary least square approach was applied to determine the data gathered (OLS). The capital ratio (CTR), current ratio (CR), and cash ratio (CSR) were used to monitor liquidity management, while return on assets was applied to gauge performance (ROA). Based on the study's findings, there is a positive relationship between the firm's performance as measured by return on assets and liquidity management as measured by capital ratios, current ratios, and cash ratios. The outcome shown that managing liquidity is a critical aspect of corporate operations, which ultimately results in business profitability. By using effective and efficient liquidity management, the firm's worth and the wealth of its shareholders may be maximized⁴³⁸.

In order to assess the deposit money banks' financial performance in respect to liquidity management among Nigeria's listed banks, a study was conducted. The primary source of data for the 15 sample businesses was the financial reports covering the years 2009–2018. The research showed that the financial performance of deposit money banks in Nigeria is influenced by liquidity management in both positive and negative ways. The study came to the conclusion that Nigerian deposit money banks' financial performance is impacted by liquidity management⁴³⁹

A study evaluated the effect of liquidity on Nigerian financial performance of deposit money institutions. The study included five (5) banks as a sample. The businesses provided secondary data over a ten-year period, from 2007 to 2016. Utilizing multiple regression analysis, the data were examined. The findings indicated that liquidity has a favorable and significant impact on the profitability measures for banks as well as on the return on capital employed (ROCE)⁴⁴⁰.

A research was conducted between 1986 and 2011 utilizing secondary data from the whole deposit money banking sector to examine the empirical evidence of the impact of managing liquidity on the financial performance of deposit money banks in Nigeria. According to research, deposit money institutions in Nigeria see both beneficial and bad effects from liquidity management⁴⁴¹.

A research that was conducted in Nigeria also looked at the management of liquidity and how it affected bank productivity. The entire time frame was 25 years (1986–2011), 24 banks formed the basis of the target population. The SPSS software was used to gather test data for the study from secondary data and evaluate it. According to the study's findings, deposit money institutions' operations are favourably impacted by liquidity management. Using correlation analysis to further analyze the data, the researcher discovered a positive connection between stock returns and the cash liquidity reserve ratio and a negative correlation between equity returns and the deposit loan ratio⁴⁴².

Effect of liquidity management on the financial performance of commercial banks in Botswana was studied on 9 commercial banks in Botswana and the study covered a period of 9 years from 2011 to 2019. The study used Return on Assets and Return on Equity to measure financial performance. Cash and cash equivalents to total assets ratio, Cash to deposits ratio, Loans to deposits ratio, Loans to total assets ratio, Liquid assets to total assets ratio, and Liquid assets to deposits ratio were used as proxies for liquidity management. The results from regression analysis show statistically significant positive relationships for Loans to total assets ratio and Liquid assets to total assets ratio with return on assets and return on equity. Loans to deposits ratio and Liquid assets to deposits ratio had statistically significant negative relationships with return on assets and return on equity. Cash and cash equivalents to total assets ratio had statistically insignificant

positive relationship with return on assets and return on equity whilst cash to deposits ratio had statistically insignificant negative relationship with return on assets and return on equity⁴⁴³.

The study looked into the effect of liquidity management on profitability in ten deposit money banks in Nigeria between 2008 and 2017. Return on asset served as a proxy for profitability while four variables- current ratio, loan to deposit ratio, deposit to asset ratio and liquidity ratio surrogated for liquidity management. Using Random effects generalised least squares as estimation technique, results reveal a positive and statistically significant relationship between two liquidity management proxies (current ratio and liquidity ratio) and return on asset. The study did not find empirical evidence in support of loan to deposit ratio and deposit to asset ratio as having influence on profitability of the selected banks, as results produced insignificant relationship with profitability⁴⁴⁴.

According to a Nigerian research on the effect of liquidity on the performance of Nigerian banks: According to a dynamic panel method, bank liquidity in Nigeria is advantageous and a key factor in bank success. Significant factors influencing bank profitability include prior performance, board size, liquidity, and past performance, as well as debt structure.⁴⁴⁵.

2.3.4. Bank Size and financial Performance of Deposit Money Banks

An investigation on the beneficial benefits of bank size on the success of Nepal's commercial banks. For the 28 banks that were arbitrarily chosen for the study, which covered the years 2013 to 2018, a panel research design was used. As statistical techniques, descriptive and inferential statistics were employed. The data analysis uses SPSS Version 20. The study's findings revealed no connection between profitability and bank size (assets) ⁴⁴⁶.

An examination of the effect of bank size on profitability was carried out in Kenya between 2009 and 2018 and involved 42 commercial banks. The autoregressive distributed lag model was used to determine the stability of the equilibrium as well as the rate of adjustment to equilibrium, while regression analysis revealed the direction and size of the associations. The findings indicated that returns on assets were positively and significantly influenced by bank size. Their research showed that a bank's size affects its profitability, and as a result, bank mergers and other growth plans increase profits, as shown by the bidirectional causation between the variables⁴⁴⁷.

Another research in Kenya examined the effect of bank size on the financial performance of Kenyan banks using panel data from 2012 to 2016 with the number of branches, capital base, client deposits, loans, and advances as the primary variables. Based on the study, there is a correlation between bank size and financial performance, and larger banks have greater ROA than medium-sized and small banks⁴⁴⁸.

In a Pakistani research, the profitability of both commercial and Islamic banks was evaluated for the years 2008 to 2012. using information from five commercial and five Islamic banks. Return on assets and firm size across all banks, as measured by the number of branches, were the study's factors. The results of the regressions reveal that there is a positive association between company size and profitability in commercial banks, however no such relationship was observed for Islamic banks since those institutions were able to make more money with smaller sizes⁴⁴⁹

Another research in Kenya looked at the effect of business size on the financial performance of Kenyan commercial banks from 2012 to 2016. Data was gathered for the study from the chosen institutions' publicly available financial statements using a descriptive survey research approach.

In the data analysis, correlation analysis was also used, and the results showed a positive link between business size and the financial performance of commercial banks in Kenya⁴⁵⁰.

In Ethiopia, data from two public and seven private banks for the years that were taken into consideration for the study were studied to identify the contributing factor affecting the financial performance of commercial banks in Ethiopia. While the internal and external factors were taken into consideration to examine the factors, return on assets was utilized as a proxy for financial success. Data was examined utilizing descriptive, correlational, and regression techniques, and the results showed that liquidity and earnings ratio had a favorable relationship with return on assets. Further research indicated a negative correlation between CAR, the non-performing loan to total loan ratio, and industry growth and profitability⁴⁵¹.

Another research in Zimbabwe examined the connections between bank performance, size, and efficiency between 2009 and 2014. According to the research, effectiveness is positively correlated with both financial success and economic stability. According to the report, a rise in economic activity raises demand for financial services, which boosts efficiency⁴⁵².

A study investigated firm-specific factors that affect the profitability of 8 composite insurance company in Nigeria from 2009-2015. The results of the regression model reveal that while a negative linear relationship exists among return on asset, leverage, tangibility, and size, there is a positive linear relation between return on asset, risk, and growth of the composite insurance company in Nigeria⁴⁵³.

An investigation on the elements that significantly impact the financial performance of Nepal commercial banks was conducted there. 28 banks from the research period of 2013 to 2018 were studied. Data from the Balance Sheet Annual Reports that were cross-sectional time series were

utilised in the research. The results of different tests proved that the profitability (ROA) has not been significantly influenced by size of the bank (Assets)⁴⁵⁴.

A study that covered the years 2009 to 2018 looked at the impact of bank size on the profitability of 42 commercial banks in Kenya. The autoregressive distributed lag model was used to determine the stability of the equilibrium as well as the rate of adjustment to equilibrium, while regression analysis revealed the direction and size of the associations. The findings indicated that returns on assets were positively and significantly influenced by bank size. Their research showed that bank size affects profitability, and as a result, bank mergers and other expansion methods increase profitability, as shown by the evidence of bidirectional causality between the variables⁴⁵⁵.

A research in Pakistan used the pooled ordinary least square (POLS) model to evaluate the factors that affected the top 10 banks' profitability internally from 2004 to 2008. The research found that due to a lack of scale economies, more total assets may not always translate into better earnings. Additionally, bigger loan amounts increase profitability but just barely, whereas equity and deposits significantly affect profitability. Total assets, equity/total assets, deposits/total assets, and loans/total assets were shown to be the key internal predictors of bank profitability in Pakistan⁴⁵⁶.

A research in Nigeria looked at the corporate size and financial performance of Nigerian deposit money banks from 2010 to 2019. All banks listed on the Nigerian Stock Exchange throughout the review period made up the population of the study, which used an ex post facto and correlational research approach. Ten (10) banks were included in the sample after data was filtered using a straightforward random sampling procedure. The Central Bank of Nigeria Statistical Bulletin and the sampled banks' financial statements were the primary secondary sources from which the study acquired its data. With the use of descriptive and inferential statistics, the gathered secondary data

was examined. Multiple regression analysis was used in the inferential statistics (parsimonious error correction model). The findings indicated a favorable and substantial correlation between bank size and deposit money banks' return on assets in Nigeria. The study came to the conclusion that deposit money banks' financial performance is favorably impacted by bank size⁴⁵⁷.

On the basis of historical panel data analysis, a research also looks at the effect of company size on the profitability of listed Deposit Money Banks (DMBs) in Nigeria. Ex-post facto research methodology was used. The sampling quoted Deposit Money Banks (DMBs) annual reports and accounts from 2005 to 2014 were applied to compile the data. Random-effect and fixed-effect The GLS (Generalized Least Square) regression approach was employed to analyze the data. The results reveal that the independent variable, company size, has a negligible positive effect on the ROA and ROE proxies for DMB profitability. Conclusion: The profitability of the listed DMBs in Nigeria does not significantly depend on the firm size⁴⁵⁸.

The effect of business size on the financial performance of banks quoted on the Nigerian Stock Exchange was examined in a research. The study used an ex post facto research approach using secondary data from the five banks' publicly available financial records. The dependent variable was financial success as determined by return on assets, whereas the independent variable was business size as determined by the log of total assets. With the use of STATA for panel regression, the study's model was analyzed using pooled ordinary least square regression and fixed effect/random effect regression. Additionally, correlation analysis and descriptive statistics were produced. As a result of scale diseconomies, the findings indicated that business size had a negligible and adverse impact on banks' financial performance⁴⁵⁹.

A study used a panel data from 2012 to 2016 to assess the influence of bank size on the financial performance of Kenyan banks using; the number of branches, capital base, number of customer deposit, loans and advances as the key variables. The study found a positive relationship between bank size and financial performance and revealed that larger banks exhibit higher ROA relative to medium and small⁴⁶⁰.

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2.4 Conceptual Framework on Asset Quality, Capital Adequacy and Financial Performance of Deposit Money Banks

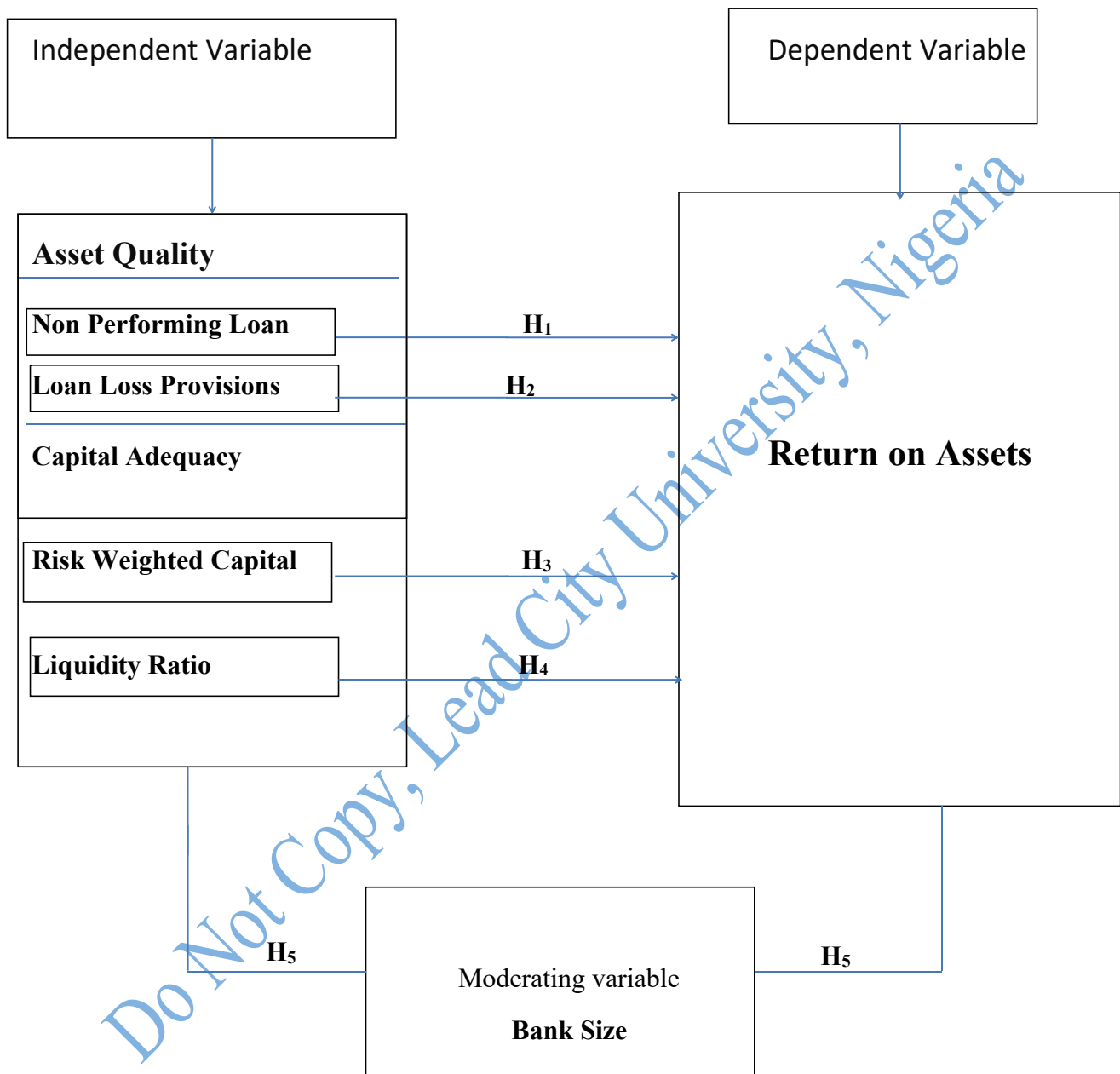


Figure: 2.1 Conceptual Framework

Source: Researcher's Fieldwork 2023

Based on the literature reviewed, this study came up with a conceptual model as illustrated in Figure 2.1. The illustration depicts that asset quality and capital adequacy can affect the financial performance of deposit money banks in Nigeria. Therefore asset quality measured by non-performing loans and total loans, capital adequacy measured by the ratio of total capital to total risk weighted assets and liquidity are the representation of independent variables in this study, while financial performance of deposit money banks is the dependent variable which is proxied by return on assets., bank size was used as moderating variable.

2.5 Summary of the Gaps in Literature Reviewed

The literature review has elaborated how banks have put in to use the Markowitz modern portfolio theory, Buffer theory of Capital Adequacy and Incentive based theory so as to alleviate the asset quality, capital adequacy and maximizing their returns thereby linking the relationship between the banks quality of assets, capital adequacy with performance. However, since assets quality and capital adequacy cannot solely determine the performance of deposit money banks, other factors which determine the financial performance of deposit money banks have been reviewed. Past studies on assets quality, capital adequacy and financial performance have also been reviewed.

However, vast of studies on the effect of asset quality, capital adequacy and financial performance of deposit money banking institutions in Nigeria have well been documented from both theoretical and empirical perspectives with the help of regression estimation techniques. However, the past studies on the effect of asset quality and capital adequacy on Deposit Money Banks (DMBs) performance in Nigeria has only been addressed in a separate form which does not allow a wider view on the study and very small number of studies with citation-worthy

significance, to the best of the researcher's knowledge.

Most of the past studies failed to recognize the liquidity ratio as a measure of capital adequacy. Finally, this study has made us realize that loan loss provisions are both measures of asset quality and capital adequacy, which brings about gaps in the past studies. Among such works are the scholarly works that studied the asset quality and performance of fifteen selected commercial banks quoted on the Nigeria Exchange Group^{65,393}. Several studies carried out on the aspects of asset quality of deposit money banks and their financial performance show some relevancy between the two constructs. Measuring both asset quality and capital adequacy is found to determine the overall status of a bank, and this is primarily affected by the credit administration program and the loan portfolio quality, which is addressed in this study⁴⁶¹.

Even though studies were undertaken by researchers on capital adequacy and bank performance in Nigeria, many of them failed to incorporate other firm-specific factors that affect firm performance, like the size of the bank, in their studies. ^{412,413,414,415,416,417,418,419,420,421}. Additionally to asset quality and capital adequacy, this study tries to add liquidity ratio as a measure of capital adequacy and bank size as a moderating variable to see its influence on the determinants of bank performance, as they were not used in many of the previous related studies.

Based on these gaps, this work is conducted to investigate the effects of asset quality and capital adequacy on the performance of deposit money banks in Nigeria using the estimation of the ordinary least squares (OLS) technique. Since then, the OLS technique has become a very popular estimation technique for investigating the link and the velocity of adjustment of the variables under study. Therefore, it is essential that we use this estimation tool to bridge the knowledge gap and find another perspective.

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Chapter Three

Methodology

This chapter outlines the methods and procedures of analysis and also the estimation processes that will invariably enhance a detailed analysis of the research objectives and the formulated hypotheses. The research method outlined in this chapter gives empirical relevance to the research. This section thereby captures the research design, population and sample representation, method and instrument for data collection, reliability, and validity tests. Other parts include the data analysis method, model specification, and *a priori* expectations.

3.1 Research Design

This study used an *ex post facto* research design to determine the effect of asset quality and capital adequacy on the financial performance of deposit money banks listed in Nigeria. This study design was predicated on an unchangeable truth that has already been established. It is a type of research design where the investigation begins independently of the researcher after the event has taken place. The study also utilized an *ex post facto* research approach to look at the stated goals. By outlining the relevant variables, this approach offers more information about the most likely study problem. Additionally, this design enables the researcher to extrapolate the results to a wider population. As a result, the research design used allows the researcher to get insight into how the explanatory variables (capital adequacy proxy by risk-weighted assets and liquidity ratio, asset quality proxy by non-performing loans, and loan loss provisions) affect the dependent variable (financial performance of deposit money banks quoted in Nigeria).

3.2 Population of the Study

In this study, licensed deposit money banks in Nigeria that made up of the population are currently twenty-eight (28) as at December 2021, however only thirteen (13) of them were listed on the Nigeria Exchange Group (NEG). The sample for this study was selected from a pool of solely deposit money banks that are listed on the NEG as at the period of this study, which is the study's main focus.

3.3 Sample Size and Sampling Technique

This study focused on the 13 deposit money banks quoted in the exchange group due to the fact that only these banks have the data that covers the period 2012–2021. The period was chosen as a result of the sudden increase in non-performing loans by banks and the reduction in capital adequacy ratios during this period, which pose a great concern. During the period of this study, there were only 13 DMBs quoted in Nigeria, and all of them met the criteria for this research. The total enumeration sampling technique was adopted in this study. This was used to the extent that all quoted DMBs that have their information available as of the period of this research were used.

3.4 Description of the Research Instrument

In this research, secondary data sources were used. Data on bank-specific variables was specifically extracted from published financial statements of chosen quoted DMBs, the National Bureau of Statistics (NBS), the Nigeria Exchange Group (NEG), and the Statistical Bulletin of the Central Bank of Nigeria (CBN).

3.5. Validity and Reliability of Research Instrument

The annual and financial reports of the various DMBs served as the study's main source of secondary data. The quality of the financial statements was further supported by the fact that the annual and financial reports were prepared with strict adherence to accounting rules and audited by a qualified and external auditors according to the regulation. In addition, a published financial statement is characterized by objectivity, completeness, comparability, reliability and availability of data.

3.6 Method of Data Collection

For the purpose of this research work, secondary data sources were used. Data on bank-specific variables was specifically extracted from published financial statements of chosen quoted DMBs, the National Bureau of Statistics (NBS), the Nigeria Exchange Group (NEG), and the Statistical Bulletin of the Central Bank of Nigeria (CBN).

3.7 Method of Data Analysis

For the purpose of this research work, a panel Ordinary Least Square (OLS) regression analysis was applied using *E-Views 10* statistical package for the data analysis. While carrying out the analysis of the variables used in the study, the study employed a correlation analysis that shows the relationship between the dependent and independent variables used in the study. Also, regression analysis was used to show the level of significance of the variables and the coefficient of relationship among the variables used in the models.

3.7.1 Model Specification

This research used a panel data methodology while estimating the correlation between asset quality, capital adequacy and their determinants as well as their effect on the financial performance of deposit money banks in Nigeria with the use of an ordinary least square (OLS) model. Panel data are able to manage individual heterogeneity due to hidden factors which if neglected in times-series or cross-section estimations lead to prejudiced results¹. The general form of the models can be specified as follows:

$$Y_{it} = \alpha + \beta X_{it} + \epsilon_{it}$$

Where the subscript i denotes the cross-sectional dimension and t represent the time-series dimension. The left-hand variable Y_{it} represents the dependent variable in the model, and X_{it} contains the set of explanatory variables in the estimation model. α is the constant, and β represents the coefficients. ϵ_{it} represents the random error term.

The study adopted a panel data regression model. The equation is as follows;

$$Y_{it} = \alpha + \beta_1 X_{1it} + \mu \dots \dots \dots \text{(i)}$$

$$Y_{it} = \alpha + \beta_2 X_{2it} + \mu \dots \dots \dots \text{(ii)}$$

$$Y_{it} = \alpha + \beta_3 X_{3it} + \mu \dots \dots \dots \text{(iii)}$$

$$Y_{it} = \alpha + \beta_4 X_{4it} + \mu \dots \dots \dots \text{(iv)}$$

$$Y_{it} = \alpha + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \beta_4 X_{4it} + \beta_5 X_{5it} + \mu \dots \dots \dots \text{(v)}$$

Where: α = constant

Y_i = Banks financial performance.

$\beta_1 \dots \beta_n$ = Betas for each factor.

X_1 - X_4 are the variables influencing financial performance.

X_5 = Moderating variable. Where :

X_1 = Non-performing loan

X_2 = Loans loss provision

X_3 = Risk-weighted assets

X_4 = Liquidity

X_5 = Bank size

i = The number of quoted deposit banks (from the first to the thirteenth)

t = Time period in years (2012-2021)

μ = Error term with a significance level of 5%

The functional relationship between asset quality, capital adequacy and financial performance of banks in Nigeria is given as:

$Y = f(X)$

Y = Dependent Variable

X = Independent Variable

Y = Financial Performance

X_1 = Non performing loans

X_2 = Loans loss provisions

X_3 = Risk- weighted assets

X_4 = Liquidity ratio

X_5 = Bank size

Financial performance of banks in Nigeria (the dependent variable Y) is posited to depend on Non-performing loans, Loans loss provisions, Risk- weighted assets and Liquidity ratio of these banks (the independent variable X_1, X_2, X_3, X_4 respectively) and not vice versa.

One indicators of financial performance used in this study and this is Return on Assets (ROA).

Where

Y = Return on Assets (ROA)

To capture the effect of asset quality and capital adequacy on financial performance of banks in Nigeria, this study will use the ratio of Non-performing loan to total loans, ratio of Loans loss provision to total loans respectively as the indicator of asset quality and the ratio of Total Capital to Risk-Weighted Assets and ratio of Total loans and advances to Total deposits as the indicator of capital adequacy. In addition, this research incorporated bank size as amoderating variable to see its effect on the effect of asset quality and capital adequacy on financial performance of deposit money banks in the country. Thus, financial performance of deposit money banks in Nigeria was posited to depend on Non-performing loans (X₁), Loans loss provisions (X₂), Risk-weighted assets (X₃), Liquidity ratio (X₄) and moderating variable (X₅).

The model is specified in econometric form as follows:

Model One

$$Y_{it} = \alpha + \beta_1 X_{1it} + \mu$$

$$ROA_{it} = \alpha_0 + \beta_1 NPL_{i,t} + \mu \text{ -----(i)}$$

Model Two

$$Y_{it} = \alpha + \beta_2 X_{2it} + \mu$$

$$ROA_{it} = \alpha_0 + \beta_2 LLP_{i,t} + \mu \text{ ----- (ii)}$$

Model Three

$$Y_{it} = \alpha + \beta_3 X_{3it} + \mu$$

$$ROA_{it} = \alpha_0 + \beta_3 RWA_{i,t} + \mu \text{ ----- (iii)}$$

Model four

$$Y_{it} = \alpha + \beta_4 X_{4it} + \mu$$

$$ROA_{it} = \alpha_0 + \beta_4 LQ_{i,t} + \mu \text{ ----- (iv)}$$

Thereafter, with the inclusion of moderating variable it would be expressed as:

Model Five

$$Y_{it} = \alpha + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \beta_4 X_{4it} + \beta_5 X_{5it} + \mu \text{ (v)}$$

$$ROA_{it} = \beta_0 + \beta_1 NPL_{i,t} + \beta_2 LLP_{i,t} + \beta_3 RWA_{i,t} + \beta_4 LQ_{i,t} + \beta_5 BS_{i,t} + \mu \text{ ----- (v)}$$

Where:

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

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

LLP_{it} = Loans loss provisions of bank i at time t

LQ_{it} = Liquidity of bank i at time t

BS_{it} = Bank size of bank i at time t

β_{it}, α_{it} are parameters of economic relationship estimated.

μ = Stochastic variable of error term.

Equations i-v show models depicting the effect of asset quality, capital adequacy and moderating variable on indicator of financial performance of deposit money banks in Nigeria (ROA). Since all these variables interact simultaneously in real life, this study then ascertained the effect of asset quality and capital adequacy on financial performance of deposit money banks in Nigeria.

3.7.2 *A priori* Expectation

Variables	Expected Signs
Return on Assets	Positive (+)
Non-performing loans	Negative (-)
Loans loss provisions	Negative (-)
Risk weighted assets	Positive (+)
Liquidity	Negative (-)
Bank size	Positive (+)

Source: Researcher's report 2023

3.7.3 Variable Description and Measurement

Dependent variable: financial performance captured by return on asset (ROA) is the study's sole dependent variable. Return on assets (ROA) often described as the primary ratio, relates the income earned by the bank to the assets it used in the business operation. It is commonly defined as net income (or pre-tax profit)/total assets. It provides information about management's performance in using the assets of the company to generate money. Profit before tax is generally ideal because calculations using net income after tax figures may show trends due simply to changes in the rates of taxation².

Liquidity ratio is a widely employed measure for assessing liquidity and credit risk, which measured by dividing the banks total loans or total financing by its total deposits. This

relationship shows, however, the proportion of a bank's loans that are backed by deposits. Alternatively, a high loan to deposit ratio may indicate several things, but from liquidity's viewpoint, a high value of such ratio indicates a potential source of illiquidity and insolvency due to deposits are quite stable source of funding for a bank and loans due to decreased market liquidity, this asset is riskier than other financial assets. Therefore, a higher loan deposit ratio means more financial stress by making excessive loans. So, the lower loan deposit ratio is always favourable to the higher one. Liquidity ratio (LQR) is calculated by dividing net loans to total deposits. It is a measure of bank liquidity position. The higher the loan balances relative to deposits, the lower the liquidity level.

A risk-weighted asset (RWA) is the ratio of capital to the sum of a risk-weighted bank's assets. This ratio measures the amount of a bank's capital in relation to the amount of its risk-weighted credit exposure. With respect to this thesis, CAR is defined as the ratio of Shareholders Funds or equity to Total Assets. Total Capital to risk adjusted Assets. This is in recognition of the fact that capital funds provides cushion for losses arising from the risk in banking

Non-Performing Loans (NPL) ratio, which is calculated by dividing non-performing loans to total loans and advances, is used as an indicator of assets quality. The higher the NPL ratio, the poorer the credit quality and, therefore, the higher the risk that more loan loss will be charged against income. The quality of assets should determine the degree of solvency or insolvency of a Bank. The quality of assets held in a bank's portfolio is one of the indices for assessing the earning capacity of a bank and its relative liquidity position. A low ratio indicates high quality bank's assets portfolio while a high ratio indicates low quality asset portfolio. The proxy for assets quality as regards this study is the ratio of non-performing loans to total loans (NPTL). This

approach to credit risk has been used by researchers^{3,4}. A negative relationship between NPTL and profitability is expected.

Loans loss provision (LLP): LLP is the capital that a bank must set aside to cover changes in future expected losses on problem loans⁵. The proxy used for this variable is loan-loss provisions over total loans. It is a measure of capital risk, as well as asset quality of banks. If banks operate in more risky environments and lack the expertise to control their lending operations, it will probably result in a higher loan-loss provision ratio to cover this risk. Hence, the ratio is expected to have a negative relationship with profitability.

Bank size (BS): The total assets determine the size of a bank. We use size of the bank in this study, as a moderating variable, which account for size related economies and diseconomies of scale. In most of the finance literature, the total assets of the banks are used as a proxy for bank size. Furthermore, the dependent variable "ROA" displays financial performance relative to the bank's assets, hence it is appropriate in this context to use bank assets to estimate bank size⁶. Here the study used the logarithmic form of assets to determine size of bank and it has expected positive sign.

3.7.4 Pre Estimation and Diagnostics Test

The following estimation procedures were used to achieve the five objectives of this study

3.7.4.1 Descriptive Analysis

This was used to observed trends of mean, median, range, standard deviation, skewness kurtosis, jarque-bera and probability of the variables. These descriptive measures are normally used to detect if there are significant changes in trend of data, and to measure asymmetric distribution and test for normal distribution^{7,8}.

3.7.4.2 Inferential Analysis

This was done to test the hypotheses formulated for this study. This stage involved the use of panel data analysis which Hausman test was used to determine the best estimator between the fixed effect model and the random effect model to test the hypotheses. Also, robustness checks were conducted with the use of residual diagnostic test through Lagrange Multiplier (LM) test, correlation and heteroskedasticity test. These robustness checks are usually conducted to know if there is serial correlation among the variables and to ensure that the models used are qualify to produce good results^{9,10}.

3.7.4.3 Hausman and Breush and Pagan Lagrangian Multiplier (LM) Tests

The Hausman test is sometimes described as a test for model misspecification. The Hausman test can assist in determining whether to use a fixed effects model or a random effects model in panel data analysis (the analysis of data across time). The null hypothesis is that the preferred model is random effects. The alternate hypothesis is that the model is fixed effects. Essentially, the research looks to see if there is a correlation between the unique errors and the regressors in the model. In a regression model, the Hausman Test finds endogenous regressors (predictor variables). Endogenous variables have values that are determined by other variables in the system. Having endogenous regres in a regression model, the Hausman Test finds endogenous regressors (predictor variables). The values of endogenous variables are influenced by other variables in the system. Ordinary least squares estimators will not work in the presence of endogenous regressors since one of their basic premises is that there is no link between the predictor variable and the error term.ors in a model will cause ordinary least squares estimators to fail, as one of the assumptions of OLS is that there is no correlation between a predictor variable and the error term.

The Hausman test was carried out to determine whether fixed effect, random effect or pooled ordinary least square estimation technique was appropriate for the model. Using the Hausman test, the appropriateness of the fixed effect and random effect estimation methods are determined. The study however went further to test the appropriateness of the random effect estimation technique and pooled effect model by conducting the Breusch and Pagan Lagrangian Multiplier test. A test known as the Lagrangian Multiplier (LM) test was used to determine whether Random Effect (RE) or Common Effect is preferable (CE). With this test, the Random Effect model is preferred if the null hypothesis is rejected, whereas the Pooled (OLS) model is accepted if the null hypothesis is not rejected.

3.7.4.4 Cross Sectional Dependence Test

This test enables the researcher to investigate whether there are issues of dependence across the residuals of the model. It reveals if the model residuals are correlated over time. It was carried out using Pesaran CD test.

Serial Correlation Test

Statistics' term for the relationship between observations of the same variable over a range of time periods is serial correlation. There is no connection and each observation is independent of the others if the serial correlation of a variable is 0. On the other hand, if a variable's serial correlation has a skew toward one, the observations are serially correlated, and subsequent observations are influenced by the values of the past. In essence, a serially linked variable has a pattern and is not random. When a variable and a lagged version of itself (for example, a variable at times T and at $T-1$) are seen to be correlated with one another over time, this is known as serial correlation in a time series. When a variable's current level influences its potential future

level, repeating patterns frequently display serial correlation. Error words happen when a model is not entirely correct and produces inconsistent results when used in practical applications. The error term is serially correlated when error terms from various (often neighboring) periods (or cross-section data) are correlated. When errors from one period continue into subsequent ones, this is known as serial correlation in time-series studies. Breusch-Godfrey serial correlation LM test: BG test will be performed to determine whether there is serial correlation in the residual.

The decision criterial for the test is as follows:

Ho: No serial correlation exist between the residuals (μ_i and μ_j)

H1: Serial correlation exist between the residuals (μ_i and μ_j)

3.7.4.5 Heteroskedasticity Test

Heteroscedasticity is a term used to describe the situation when the variance of the residuals from a model is not constant. Where the variance of the residuals is constant, it is called homoscedasticity. Homoscedasticity is desirable. Where the variance of the residuals is not constant, it is heteroscedastic which is not desirable. Heteroskedasticity (also spelled *heteroscedasticity*) refers to the error variance, or dependence of scattering, within a minimum of one independent variable within a particular sample. These variations can be used to calculate the margin of error between data sets, such as expected results and actual results, as it provides a measure of the deviation of data points from the mean value.

Heteroskedasticity can arise in regression models for a variety of reasons, but most frequently due to issues with the dataset. It has been demonstrated that because the discrepancies between the smallest and greatest values are so large, models with a wide range of values are more likely to exhibit heteroskedasticity. To test for heteroscedasticity in the data set, Breusch-Pagan-Godfrey test was employed. The decision criterial is that where the p value < 0.05 it means there is

presence of heteroscedasticity for it otherwise, it is homoscedastic. When using regression analysis, especially the analysis of variance, the presence of heteroscedasticity is a significant concern since it might invalidate statistical tests of significance that rely on the assumption that the modeling errors are uncorrelated and uniform. Hence, their variances do not vary with the effects being modeled.

3.7.4.6 Normality Test

In order to establish if a data set is adequately described by a normal distribution and to calculate the likelihood that a random variable underlying the data set is normally distributed, normality tests were used. To verify whether sample data were taken from a population with a regularly distributed distribution, a normality test was employed (within some tolerance). A regularly distributed sample population is needed for a number of statistical tests, including the Student's t-test and the one-way and two-way ANOVA. The purpose of a normality test is to determine if the distribution of a set of data is compatible with that of a normal distribution. Usually, they are tests of the null hypothesis—more precisely, a goodness-of-fit test—which states that the data are representative of a normal population. Hence, while it is possible to reach a definitive conclusion that a set of data is not normally-distributed (by rejecting the null hypothesis), the most one can say if the null hypothesis is not rejected is that the data could possibly come from a normally distributed population.

3.8 Ethical Issues of the Study

This research work adequately looked and considered the ethical issues involved in the area of research work. The researcher will ensure that information about the companies used is not of detrimental effect to their going concern and action would be taken to avoid the use of data that

negated their interest. Also those materials used are adequately referenced to avoid the issue of plagiarism.

In order to render this study ethical, the right to self-determination, anonymity, confidentiality and informed consent would be observed. The data used in this analysis will be true representation of the data from its source. The result of the study would not be falsified, adjusted or influenced to suit any expectation, as such the study made cautious analysis and explanation of data to shun any form of parody of results and any potential harm to parties involved in this research. Efforts was made to avoid bias or any form of deception in the process of presenting and interpreting the data.

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Chapter Four

Results and Discussion of Findings

4.1 Data Presentation

This chapter mainly analysed the data collected from the financial statements of the thirteen (13) quoted deposit money banks in Nigeria. The data was gathered from the annual report of the selected banks within the period of 10 years (2012-2021). The data was analysed in their raw form to determine their descriptive statistics and the correlation coefficient to determine the relationship between the variables (i.e both dependent and independent variables).

Heteroscedasticity test and serial correlation were also conducted to determine the authenticity of the data whether they are heteroskedastic or are serially correlated. Ordinary Least Square (OLS) method of data analysis was used to make inferences on the hypothesis. Chow Test, Lagrangian and Hausman test was used to select the most appropriate model between the pooled effect, fixed effect and random effect model.

4.2 Demographic Data Presentation

Table 4.1 Result of Descriptive Statistics

	ROA	NPL	LLP	LQR	BS	RWA
Mean	0.043756	6.515467	18.55833	18.14504	509000000	6.557214
Median	0.014229	3.950000	0.646852	1.171112	2093898	0.088285
Maximum	1.300572	33.90000	984.1879	702.1897	818000000	172.0269
Minimum	-0.110538	0.300000	-0.943752	0.000649	72508.00	0.001112
Std. Dev.	0.141450	6.487022	92.96825	90.11443	141000000	27.44154
Skewness	6.361296	1.902982	9.023792	5.632117	3.558071	4.944410
Kurtosis	51.63667	6.166415	91.67443	35.76595	16.18074	27.04147
Jarque-Bera	1.369003	1.327709	4.435638	6.502656	1.215345	3.660481
Probability	0.536349	0.075346	0.382903	0.096675	0.663461	0.234326
Sum	5.761073	847.3500	2412.583	2358.855	6.62E+10	852.4379
Sum Sq.Dev	2.581051	5428.507	1114959.	1047559.	2.55E+20	97141.92
Observations	130	130	130	130	130	130

Source: Author's computation, 2023 using E-views 10. Note: ROA= Return on Asset, RWA= Risk Weighted Assets, NPL= Non-performing Loan, LLP= Loan Loss Provision, BS= Bank Size, LQR= Liquidity Ratio.

The descriptive statistics result in table 4.1 showed summary of the raw dataset of thirteen (13) listed deposit money banks within a period of ten (10) years (2012 – 2021) while taking into consideration the dependent variable used in the study (financial performance proxied with return on assets) and independent variables (asset quality, proxied with non-performing loan, loan loss provision and capital adequacy proxied with risk weighted assets, liquidity ratio and bank size as moderating variable). The descriptive result showed the statistical properties of the variables which was earlier highlighted here. Special emphasis was made on the mean, standard deviation, Jarque-Bera and its Probability statistics for the variables involved in this study, skewness, kurtosis, minimum value and maximum value for all variables used.

The result in Table 4.1 showed that the mean value for ROA shows 0.043756 representing 4.4%. This connotes that from every #1 of total asset invested by quoted banks in Nigeria, #0.4k was earned as profit.

In addition, the result also showed the mean value of 6.515467, 18.55833, 18.14504, 509billion, and 6.557214 for non-performing loan (NPL), loan loss provision (LLP), liquidity ratio (LQR), bank size (BS) risk and weighted assets (RWA) respectively. Explaining each of the explanatory variables, the non-performing loan accounted for a mean value of 6.515467 indicating that the proportion of non-performing loan to total loan is 6.5% (i.e only 6.5% of the total loan are not performing to expectation according to the terms of the loan). The mean value of the loan loss provision showing a value of 18.55833% indicate that on average, the loan loss provision of deposit money banks within the period under review is 18.56%. The liquidity ratio of the banks showing a value of 18.14 indicating the proportion of liquid assets to total deposits. This means that on average, all liquid assets accounted for 18.14 times of

total deposits. The result of the banks size which was proxied with total assets showed that on average the total asset of banks average #509billion within the period under review. Lastly for the mean segment, the risk weighted assets proxied with proportion of total capital to risk weighted assets was 6.557 indicating that on average, the total capital is 6.5 times of risk weighted assets.

The descriptive statistics table in 4.1 also showed the kurtosis value of the data series that measures the peakness of the distribution of the variables. The kurtosis value can either be leptokurtic if its value is higher than 3, mesokurtic if equal to 3 and platykurtic if it less than 3. From the descriptive statistic table, the Kurtosis value for all the variables are greater than 3. This means that all variables are leptokurtic. In addition, the skewness of the data set for the deposit money banks and within the period under review, all variables are positively skewed.

The descriptive result in table in 4.1 showed the minimum and maximum value for each of the variables used in this study. The maximum and minimum value for ROA is 16.11 and -13.99 respectively while that of nonperforming loan is 0.3 and 33.9 for minimum and maximum respectively. The loan loss provision has a minimum value of -0.943752 and a maximum value of 984.1879 while the liquidity ratio of the banks proxied with the ratio of total liquid assets to total deposits has a maximum of 702.18 and a minimum value of 0.000649. Bank size proxied with total assets has a minimum value of 72508 and a maximum value of 818000000 while risk weighted assets has a minimum value of 0.001112 and maximum value of 172.0269.

The Jarque-Bera statistics and its probability value indicated the statistical significance of the variables to determine whether the data set are normally distributed. If the probability value is less than 5%, the variables are significant and are normally distributed. From the descriptive

statistics result in table 4.1 the Jarque-Bera statistics of the data set are all less than 0.05 which indicate that all data set in each variables are not normally distributed.

4.2.1 Data Analysis and Interpretation

4.2.1.1 Correlation Matrix

Table 4.2 Correlation

Covariance Analysis: Ordinary

Date: 01/21/23 Time: 15:11

Sample: 2012 2021

Included observations: 130

Correlation Probability	ROA	NPL	LLP	LQR	BS	RWA
ROA	1.000000 -----					
NPL	-0.047376 0.5925	1.000000 -----				
LLP	0.194846 0.0263	0.084753 0.3377	1.000000 -----			
LQR	-0.034958 0.6930	-0.080236 0.3642	-0.033130 0.7083	1.000000 -----		
BS	-0.061804 0.4848	-0.122968 0.1634	-0.069242 0.4337	-0.067960 0.4423	1.000000 -----	
RWA	0.718238 0.0034	-0.041519 0.6391	0.657418 0.0034	-0.048095 0.5869	-0.061935 0.4839	1.000000 -----

Source: Author's computation, 2023 using E-views 10. Note: ROA= Return on Asset, RWA= Risk Weighted Assets, NPL= Non-performing Loan, LLP= Loan Loss Provision, BS= Bank Size, LQR= Liquidity Ratio.

The correlation matrix in table 4.2 showed the level of relationship among the variables and the probability value. The result showed that non-performing loan (NPL) has a weak negative relationship with return on asset (ROA) having coefficient of -0.047376 which is not statistically significant. Loan loss provision (LLP) has a positive relationship with return on asset (ROA) and nonperforming loan (NPL). Both exhibit a weak relationship with LLP. The level of relationship between ROA and LLP is statistically significant which ROA and NPL is not statistically significant.

In addition, there is a weak negative relationship between liquidity ratio, return on asset (ROA), nonperforming loan (NPL) and loan loss provision (LLP) though not statistically significant at 5%. Furthermore, there is a negative relationship between return on asset (ROA), nonperforming loan (NPL) and loan loss provision (LLP) and liquidity ratio though not statistically significant. The result of the risk weighted assets (RWA) show a positive relationship on return on assets and loan loss provision and statistically significant. The RWA also exhibit a negative relationship on nonperforming loan (NPL), liquidity ratio (LQR) and bank size (BS) but not statistically significant at 5%. The correlations among the explanatory variables suggest to us that the regression models in the next subsection may not be free from multicollinearity problem, because the correlation between two explanatory variables (RWA and LLP) are high. Hence there is need to detect whether there exist a multi-collinearity problem using the Variance Inflation Factor (VIF) in the next section.

Table 4.3 Variance Inflation Factor

Variance Inflation Factors

Date: 01/21/23 Time: 10:12

Sample: 2012 2021

Included observations: 130

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
NPL	0.003205	2.294000	1.137094
LLP	3.90E-06	1.873776	1.801436
LQR	2.37E-06	1.073654	1.031508
RWA	4.49E-05	1.911626	1.807614
BS	0.010869	28.53307	1.130722
C	0.627121	33.80526	NA

Source: Author's computation, 2023 using E-views 10. Note: ROA= Return on Asset, RWA= Risk Weighted Assets, NPL= Non-performing Loan, LLP= Loan Loss Provision, BS= Bank Size, LQR= Liquidity Ratio.

To ensure reliability and validity of the empirical results, some diagnostic tests were conducted. In order to test for the presence of multicollinearity in the model, the Variance Inflation Factor (VIF) was carried out. The result in Table 4.3 showed that the variance inflation factor (VIF) for all the explanatory variables are less than 10 which shows that there is no Multicollinearity problem in the model as analysed in the next section.

Estimation Results

4.3 Test of Hypotheses and Discussion of Findings

This section presents the test of hypotheses formulated, interpretation and discussion of results. Five hypotheses were tested in order to determine whether asset quality and capital adequacy has any significant effect on financial performance of quoted deposit money banks in Nigeria. The Chow test, Hausman specification test and Lagrangian multiplier test was also carried out so as to choose the best estimator between the pooled effect, fixed effect and the random effect model.

Decision rule

The pre-test level of significance for all hypotheses in this study is 0.05. The null hypothesis assumed that there is no effect of the independent variable on dependent variable. If the significance of the tests exceeds the pre-set level of significance (0.05), then the null hypothesis will be accepted, but if otherwise, the null hypothesis will be rejected.

The Chow test was carried out to determine whether the pooled effect model is better than both the fixed effect and random effect model. The decision criteria for that is if the p value of the Cross-section Chi-square is less than 0.05, then the fixed/random effect model is appropriate but if otherwise, the pooled effect model will be used to carry out the estimation test.

Consequently, after the Chow test has been conducted where the fixed effect or random effect model was chosen then a Hausman test was conducted in order to choose the best estimation model between the fixed effect model (FEM) and the random effect model (REM) however, if the pooled effect was selected in the Chow test result, Lagrangian Multiplier (LM) test was

carried out to determine the best estimator model between the Pooled effect Model and the Random effect model.

The decision criteria for selecting between the fixed effect model and the random effect model under the houseman test is that where the p value is greater than the pre test value of 0.05, the random effect model is appropriate but if otherwise then the fixed effect model is appropriate.

Furthermore, for the Lagrangian Multiplier (LM) test.

4.3.1 Regression Analysis Model One

$$Y_{iit} = \alpha + \beta_1 X_{lit} + \mu \dots\dots\dots (i)$$

$$ROA_{it} = \alpha_0 + \beta_1 NPL_{i,t} + \mu \dots\dots\dots (i)$$

4.3.1.1 Chow Test

Table 4.4 Chow Test

Redundant Fixed Effects Tests

Equation: Untitled

Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	3.087542	(12,115)	0.0032
Cross-section Chi-square	37.711154	12	0.0073

Source: Author’s computation, 2023 using E-views 10. Note: ROA= Return on Asset, RWA= Risk Weighted Assets, NPL= Non-performing Loan, LLP= Loan Loss Provision, BS= Bank Size, LQR= Liquidity Ratio.

Null Hypothesis: Pooled effect model is not desirable

Alternative Hypothesis: Pooled effect model is desirable.

Decision Rule: Accept null if p value is greater than 5%. (i.e use pooled effect model)

Accept alternative if p value is less than 5%. (i.e use fixed/random effect model)

The Chow test allows us to test for whether or not the regression coefficients of each regression line are equal. If the test determines that the coefficients are not equal between the regression lines, this means there is significant evidence that a structural break exists in the data¹. The result of the Chow test in table 4.4 revealed a Cross-section Chi-square of 0.0073 which is lower than 0.05. The null hypothesis for the Chow test is that where the $P > 0.05$ then the fixed/random effect model is appropriate but if otherwise the Pooled effect is appropriate. However, since the P Value is less than 0.05 Fixed Effect/Random Effect model is appropriate. Below is the result of the Hausman test in table 4.5

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4.3.1.2 Hausman Test

Table 4.5 Hausman Test

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	2.768551	2	0.3712

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
NPL	-0.025745	-0.022478	0.007300	0.8145
(YR2-YR10)	-0.088040	-0.006124	0.002494	0.1009

Source: Author's computation, 2023 using E-views 10. Note: ROA= Return on Asset, RWA= Risk Weighted Assets, NPL= Non-performing Loan, LLP= Loan Loss Provision, BS= Bank Size, LQR= Liquidity Ratio.

Null Hypothesis: Fixed effect model is not desirable

Alternative Hypothesis: Fixed effect model is desirable.

Decision Rule: Accept null if p value is greater than 5%.

Accept alternative if product is less than 5%.

The result from the Hausman test revealed a Chi-Sq. Statistic value of 2.768551 with p-value of 0.3712 which is greater than the pre-test value of 0.05. This implies that the test considered the random effect model as the most appropriate estimator for testing the hypotheses.

After a careful consideration of the Hausman test Lagrangian test was also carried out to confirm the result of the Hausman test so as to determine the best estimator between the random effect model and pooled effect. The section below discussed that.

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4.3.1.3 Lagrangian Multiplier (LM) for Random Effect

Table 4.6 Lagrangian Multiplier (LM) Test Using Breusch-Pagan

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	16.32146 (0.0001)	0.026297 (0.8712)	16.34775 (0.0001)
Honda	4.039982 (0.0034)	-0.162163 --	2.742032 (0.0031)
King-Wu	4.039982 (0.0034)	-0.162163 --	2.522205 (0.0058)
Standardized Honda	4.460067 (0.0034)	0.032024 (0.4872)	-0.558744 --
Standardized King-Wu	4.460067 (0.0034)	0.032024 (0.4872)	-0.770400 --
Gourierioux, et al.*	--	--	16.32146 (< 0.01)

*Mixed chi-square asymptotic critical values:

1%	7.289
5%	4.321
10%	2.952

Source: Author's computation, 2023 using E-views 10. Note: ROA= Return on Asset, RWA= Risk Weighted Assets, NPL= Non-performing Loan, LLP= Loan Loss Provision, BS= Bank Size, LQR= Liquidity Ratio.

Lagrangian test (LM) is a test to determine whether Random Effect model is better than Pooled Effect (PLS) method used.

Decision Criterial

H₀: Select Pooled effect Model ($p > 0.05$)

H₁: Select Random effect Model ($p < 0.05$)

After a careful consideration of the Hausman test Lagrangian test was also carried out to confirm the result of the Hausman test so as to determine the best estimator between the random effect model and pooled effect. The Breusch-Pagan result show a p value of 0.0001 which is less than the pre-test value of 0.05. This confirms that the best estimator for this model is the random effect. To test the first hypothesis, a random effect model was used and are show in the next session

Restatement of Objective One: To examine the effect of non-performing loans on the financial performance of deposit money banks in Nigeria.

Restatement of Research Question One: How does non-performing loans affect financial performance of deposit money banks in Nigeria?

4.3.1.4 Test of Hypothesis

Table 4.7 Random Effect Model

Dependent Variable: ROA

Method: Panel EGLS (Cross-section random effects)

Date: 01/21/23 Time: 16:20

Sample: 2012 2021

Periods included: 10

Cross-sections included: 13

Total panel (balanced) observations: 130

Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
NPL	-0.022478	0.036674	-0.611458	0.5462
YR2-YR10	-0.006124	0.541659	-0.011305	0.9910
C	0.606675	0.435163	1.394135	0.1657
Effects Specification				
			S.D.	Rho
Cross-section random			1.075855	0.1709
Idiosyncratic random			2.369479	0.8291
Weighted Statistics				
R-squared	0.092973	Mean dependent var		0.263187
Adjusted R-squared	0.072728	S.D. dependent var		2.360961
S.E. of regression	2.375938	Sum squared resid		716.9253
F-statistic	0.189380	Durbin-Watson stat		1.755793
Prob(F-statistic)	0.827705			
Unweighted Statistics				
R-squared	0.002126	Mean dependent var		0.460509
Sum squared resid	863.5381	Durbin-Watson stat		0.627474

Source: Author's computation, 2023 using E-views 10. Note: ROA= Return on Asset, RWA= Risk Weighted Assets, NPL= Non-performing Loan, LLP= Loan Loss Provision, BS= Bank Size, LQR= Liquidity Ratio.

Model Specification

$$ROA_{it} = 0.606675 - 0.022478NPL + \mu \text{ -----(i)}$$

The result in table 4.7 shows regression analysis between the explanatory variable (non-performing loan) and financial performance proxied with return on assets (ROA) using the random effect model. The table shows a significant value of non-performing loan to be 0.5462 (t= -0.611458) meaning that the null hypothesis is accepted and we can confirm that non-performing loan has no statistically significant effect on financial performance of quoted deposit money banks in Nigeria. The result further shows that non-performing loan having a coefficient $\beta_1 = -0.022478$ explains that non performing loan has a negative effect on financial performance. This indicate that a #1 change in Non-performing loan will reduce ROA by - 0.022. Therefore since from our results non performing loans shows insignificant effect on deposit money banks financial performance implying that it doesn't matter in determining bank financial performance.

Discussion

The findings of this study revealed that non-performing loan has a negative effect on financial performance of deposit money banks in Nigeria. This implies that non-performing loan has insignificant effect on financial performance of quoted deposit money banks in Nigeria. The result of R^2 revealed 0.092973 indicating that 9.2% change in return on assets is caused by variations in non-performing loan. The Durbin Watson statistics of 1.755793 which is higher than the R^2 value of 0.092973 show that the result of this regression is not spurious hence it can be relied upon to make predictions. Lastly the Durbin Watson statistics of 1.755793 which is within the range of 1.5 and 2.0 shows that the model is free from serial correlation.

Test of Hypothesis Two (Ho2):Loans Loss Provisionhas no significant effect on financial performance of deposit money banks in Nigeria.

4.3.2: Regression Model Two

$$Y_{it}=\alpha+\beta_2X_{2it}+ \mu_{it}..... (ii)$$

$$ROA_{it} = \alpha_0 + \beta_2LLP_{i,t} + \mu_{it}..... (ii)$$

4.3.2.1 Chow Test

Table 4.8 Chow Test

Redundant Fixed Effects Tests

Equation: Untitled

Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	2.850988	(12,115)	0.0018
Cross-section Chi-square	33.856557	12	0.0007

Source: Author’s computation, 2023 using E-views 10. Note: ROA= Return on Asset, RWA= Risk Weighted Assets, NPL= Non-performing Loan, LLP= Loan Loss Provision, BS= Bank Size, LQR= Liquidity Ratio.

Null Hypothesis:Pooledeffect model is not desirable

AlternativeHypothesis:Pooledeffect model is desirable.

Decision Rule: Accept null ifp value is greaterthan 5%. (i.e use pooled effect model)

Acceptalternativeifp value is less than 5%. (i.e use fixed/random effect model)

The result of the Chow test in table 4.8 revealed a Cross-section Chi-square of 0.0007 which is lower than 0.05. The null hypothesis for the Chow square is that where the $P > 0.05$ then the fixed/random effect model is appropriate but if otherwise the Pooled effect is appropriate. However, since the P Value is less than 0.05 Fixed Effect/Random Effect model is appropriate. Below is the result of the Hausman test in table 4.9

4.3.2.2 Hausman Test

Table 4.9 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	31.014476	2	0.0034

** WARNING: estimated cross-section random effects variance is zero.

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
LLP	-0.002954	0.005397	0.003402	0.0034
(YR2-YR10)	-0.037855	0.135817	0.007922	0.0728

Source: Author's computation, 2023 using E-views 10. Note: ROA= Return on Asset, RWA= Risk Weighted Assets, NPL= Non-performing Loan, LLP= Loan Loss Provision, BS= Bank Size, LQR= Liquidity Ratio.

Decision Rule: Accept null if p value is greater than 5%.

Accept alternative if p value is less than 5%.

The result from the Hausman test revealed a Chi-Sq. Statistic value of 31.014476 with p-value of 0.0034 which is less than the pre-test value of 0.05. This implies that the test considered the fixed effect model as the most appropriate estimator for testing the hypotheses.

Restatement of Objective Two: determine the effect of loans loss provision on the financial performance of deposit money banks in Nigeria.

Restatement of Research Question Two: In what way does loan loss provision affects financial performance of deposit money banks in Nigeria?

4.3.2.3 Test of Hypothesis Two (Ho2): Loans Loss Provision has no significant effect on financial performance of deposit money banks in Nigeria.

Table 4.10: Fixed Effect Model

Dependent Variable: ROA

Method: Panel Least Squares

Date: 01/21/23 Time: 16:21

Sample: 2012 2021

Periods included: 10

Cross-sections included: 13

Total panel (balanced) observations: 130

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LLP	-0.002954	0.002668	-1.097030	0.0054
YR2-YR10	-0.037855	0.536268	-0.044525	0.9646
C	0.514826	0.212959	2.417486	0.0172

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.258872	Mean dependent var	0.460509
Adjusted R-squared	0.168647	S.D. dependent var	2.590049
S.E. of regression	2.361569	Akaike info criterion	4.664696
Sum squared resid	641.3559	Schwarz criterion	4.995566
Log likelihood	-288.2053	Hannan-Quinn criter.	4.799140
F-statistic	2.869200	Durbin-Watson stat	1.729065
Prob(F-statistic)	0.000979		

Source: Author's computation, 2023 using E-views 10. Note: ROA= Return on Asset, RWA= Risk Weighted Assets, NPL= Non-performing Loan, LLP= Loan Loss Provision, BS= Bank Size, LQR= Liquidity Ratio.

Model Specification

$$ROA_{it} = 0.514826 - 0.002954LLP + \mu_{it} \text{-----(ii)}$$

The result in table 4.10 shows regression analysis between the explanatory variable (loan loss provision) and financial performance proxied with return on assets (ROA) using the fixed effect model. The table shows a significant value of loan loss provisions to be 0.0054 (t= -1.097030) meaning that the null hypothesis is rejected and we can confirm that loan loss provision has a statistically significant effect on return on assets of quoted deposit money banks in Nigeria. The result further shows that loan loss provision having a coefficient $\beta_2 = -0.002954$ explains that loan loss provision has a negative effect on ROA. This indicate that a #1 change in loan loss provision will reduce ROA by 0.002954.

The result of R^2 revealed 0.258872 indicating that 25.8% change in return on assets is caused by variations in loan loss provision while the balance of 74.2% are caused by other factors not covered in the model. The Durbin Watson statistics of 1.729065 which is higher than the

R²value of 0.258872 show that the result of this regression is not spurious hence it can be relied upon to make predictions. Lastly the Durbin Watson statistics of 1.729065 which is within the range of 1.5 and 2.0 shows that the model is free from serial correlation.

Test of Hypothesis Three (Ho₃): Risk weighted capital has no significant effect on financial performance of deposit money banks in Nigeria.

4.3.3 Regression Model Three

$$Y_{iit} = \alpha + \beta_3 X_{1it} + \mu_{it} \dots \dots \dots (iii)$$

$$ROA_{it} = \alpha_0 + \beta_3 RWA_{i,t} + \mu_{it} \dots \dots \dots (iii)$$

4.3.3.1 Chow test

Table 4.11 Chow test

Redundant Fixed Effects Tests

Equation: Untitled

Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	0.358719	(12,115)	0.9749
Cross-section Chi-square	4.777244	12	0.9650

Source: Author’s computation, 2023 using E-views 10. Note: ROA= Return on Asset, RWA= Risk Weighted Assets, NPL= Non-performing Loan, LLP= Loan Loss Provision, BS= Bank Size, LQR= Liquidity Ratio.

Null Hypothesis: Pooled effect model is not desirable

Alternative Hypothesis: Pooled effect model is desirable.

Decision Rule: Accept null if p value is greater than 5%. (i.e use pooled effect model)

Accept alternative if p value is less than 5%. (i.e use fixed/random effect model)

The result of the Chow test in table 4.11 revealed a P value Cross-section Chi-square to be 0.9650 which is greater than 0.05. However, since the P Value is greater than 0.05 Pooled effect model is appropriate, hence Lagrangian multiplier test will be carried out to determine the best estimator between the pooled effect and the random effect model.

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4.3.3.2 Lagragian Multiplier Test

Table 4.12 Lagragian Multiplier Test

Lagrange Multiplier Tests for Random Effects

Null hypotheses: No effects

Alternative hypotheses: Two-sided (Breusch-Pagan) and one-sided

(all others) alternatives

	Cross-section	Test Hypothesis	
		Time	Both
Breusch-Pagan	3.894133 (0.0485)	0.004100 (0.9489)	3.898232 (0.0483)
Honda	-1.973356 --	0.064028 (0.4745)	-1.350099 --
King-Wu	-1.973356 --	0.064028 (0.4745)	-1.243464 --
Standardized Honda	-1.797458 --	0.264922 (0.3955)	-5.006884 --
Standardized King-Wu	-1.797458 --	0.264922 (0.3955)	-4.855613 --
Gourierioux, et al.*	--	--	0.004100 (≥ 0.10)

*Mixed chi-square asymptotic critical values:

1%	7.289
5%	4.321
10%	2.952

Source: Author's computation, 2023 using E-views 10. Note: ROA= Return on Asset, RWA= Risk Weighted Assets, NPL= Non-performing Loan, LLP= Loan Loss Provision, BS= Bank Size, LQR= Liquidity Ratio.

Lagrangian test (LM) is a test to determine whether Random Effect model is better than Pooled Effect (PLS) method used.

Decision Criterial

H0: Select Pooled effect Model ($p > 0.05$)

H1: Select Random effect Model ($p < 0.05$)

After a careful consideration of the hauseman test Lagragian test was also carried out to confirm the result of the Hauseman test so as to determine the best estimator between the random effect model and pooled effect. The Breusch-Pagan result show a p value of 0.0485 which is less than the pre-test value of 0.05. This confirms that the best estimator for this model is the random effect. To test the third hypothesis, a random effect model was used and was shown in the next session. To further confirm the result of the Lagrangian multiplier result, a hauseman test was also performed in the next table.

4.3.3.3 Hauseman Test

Table 4.13 Hauseman Test

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	1.970526	2	0.3733

** WARNING: estimated cross-section random effects variance is zero.

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
RWA	0.077624	0.067768	0.003450	0.1644
(YR2-YR10)	0.235048	0.158471	0.006455	0.3405

Source: Author's computation, 2023 using E-views 10. Note: ROA= Return on Asset, RWA= Risk Weighted Assets, NPL= Non-performing Loan, LLP= Loan Loss Provision, BS= Bank Size, LQR= Liquidity Ratio.

Decision Rule: Accept null if p value is greater than 5%.

Accept alternative if p value is less than 5%.

The result from the Hausman test revealed a Chi-Sq. Statistic value of 1.970526 with p-value of 0.3733 which is greater than the pre-test value of 0.05. This implies that the test considered the random effect model as the most appropriate estimator for testing the hypotheses.

Restatement of Objective Three: examine the effect of risk weighted capital on the financial performance of deposit money banks in Nigeria.

Restatement of Research Question Three: In what way does a risk weighted assets affects financial performance of deposit money banks in Nigeria?

4.3.3.4 Test of Hypothesis Three (Ho3): Risk weighted capital has no significant effect on financial performance of deposit money banks in Nigeria.

Table 4.14 Random Effect Model

Dependent Variable: ROA

Method: Panel EGLS (Cross-section random effects)

Date: 01/21/23 Time: 16:28

Sample: 2012 2021

Periods included: 10

Cross-sections included: 13

Total panel (balanced) observations: 130

Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RWA	0.067768	0.006009	11.27749	0.0034
YR2-YR10	0.158471	0.418795	0.378398	0.7058
C	0.016138	0.168917	0.095537	0.9240

Effects Specification

	S.D.	Rho
Cross-section random	0.003400	0.0034
Idiosyncratic random	1.872822	1.0000

Weighted Statistics

R-squared	0.516447	Mean dependent var	0.460509
Adjusted R-squared	0.508831	S.D. dependent var	2.590049
S.E. of regression	1.815195	Sum squared resid	418.4564
F-statistic	67.81949	Durbin-Watson stat	1.674968

Prob(F-statistic) 0.003400

Unweighted Statistics			
R-squared	0.516447	Mean dependent var	0.460509
Sum squared resid	418.4564	Durbin-Watson stat	1.674968

Source: Author's computation, 2023 using E-views 10. Note: ROA= Return on Asset, RWA= Risk Weighted Assets, NPL= Non-performing Loan, LLP= Loan Loss Provision, BS= Bank Size, LQR= Liquidity Ratio.

Model Specification

$$ROA_{it} = 0.016138 + 0.067768RWA + \mu_{it} \text{-----(iii)}$$

The result in table 4.14 shows regression analysis between the explanatory variable (risk weighted assets) and financial performance proxied with return on assets (ROA) using the random effect model. The table shows a significant value of risk weighted assets to be 0.0034 (t= 11.27749) meaning that the null hypothesis is rejected and we can confirm that risk weighted assets has a statistically significant effect on return on assets of quoted deposit money banks in Nigeria. The result further shows that risk weighted assets having a coefficient $\beta_2 = 0.067768$ explains that risk weighted assets has a positive effect on ROA. This indicate that a #1 change in risk weighted assets will improve ROA by 0.067768.

The findings of this study revealed that risk weighted assets has a positive effect on financial performance of deposit money banks in Nigeria. This implies that risk weighted assets affect financial performance of quoted deposit money banks in Nigeria. The result of R² revealed 0.516447 indicating that 51.6% change in return on assets is caused by variations in risk weighted assets the balance of 48.4% is caused by other factors not covered in the model. The

Durbin Watson statistics of 1.674968 which is higher than the R^2 value of 0.516447 show that the result of this regression is not spurious hence it can be relied upon to make predictions. Lastly the Durbin Watson statistics of 1.674968 which is within the range of 1.5 and 2.0 showed that the model is free from serial correlation.

Test of Hypothesis Four (Ho4): Liquidity Ratio has no significant effect on financial performance of deposit money banks in Nigeria.

4.3.4 Regression Model Four

$$Y_{iit} = \alpha + \beta_4 X_{4it} + \mu_{it} \dots \dots \dots (iii)$$

$$ROA_{it} = \alpha_0 + \beta_4 LQR_{i,t} + \mu_{it} \dots \dots \dots (iii)$$

4.2.4.1 Chow Test

Table 4.15 Chow Test

Redundant Fixed Effects Tests

Equation: Untitled

Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	3.187961	(12,115)	0.0006
Cross-section Chi-square	37.332691	12	0.0073

Source: Author's computation, 2023 using E-views 10. Note: ROA= Return on Asset, RWA= Risk Weighted Assets, NPL= Non-performing Loan, LLP= Loan Loss Provision, BS= Bank Size, LQR= Liquidity Ratio.

Null Hypothesis: Pooled effect model is not desirable

Alternative Hypothesis: Pooled effect model is desirable.

Decision Rule: Accept null if p value is greater than 5%. (i.e use pooled effect model)

Accept alternative if p value is less than 5%. (i.e use fixed/random effect model)

The result of the Chow test in table 4.15 revealed a P value Cross-section Chi-square to be 0.0073 which is less than 0.05. However, since the P Value is less than 0.05 random effect model is appropriate, hence hausman test was carried out to determine the best estimator between the fixed effect and the random effect model.

4.3.4.2 Hausman Test

Table 4.16 Hausman Specification Test

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	2.258030	2	0.3234

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
----------	-------	--------	------------	-------

LQR	-0.003428	-0.000435	0.003402	0.7687
(YR2-YR10)	-0.035946	0.032773	0.003922	0.2725

Source: Author's computation, 2023 using E-views 10. Note: ROA= Return on Asset, RWA= Risk Weighted Assets, NPL= Non-performing Loan, LLP= Loan Loss Provision, BS= Bank Size, LQR= Liquidity Ratio.

After a chow test was conducted, it is desired that the fixed effect model/ random effect model should be selected. In order to select the appropriate model between the fixed and random effect model, which provide consistent estimates for this study, Hausman test was employed. In view of the nature of the data, both fixed effect and random effect models were tested as indicated in the appendix. Hausman specification test was then used to decide between the two results. The result from the Hausman test revealed a Chi-Sq. Statistic value of 2.258030 with p-value of 0.3234 which is greater than the pre-test value of 0.05. This implies that the test considered the random effect model as the most appropriate estimator for testing the hypotheses.

4.3.4.3 Lagragian Multiplier Tests

Table 4.17 Lagragian Multiplier Tests

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	15.77164 (0.0001)	0.099649 (0.7523)	15.87129 (0.0001)
Honda	3.971352 (0.0034)	-0.315672 --	2.584957 (0.0054)
King-Wu	3.971352 (0.0034)	-0.315672 --	2.361235 (0.0091)
Standardized Honda	4.445785 (0.0034)	-0.126646 --	-0.711061 --
Standardized King-Wu	4.445785 (0.0034)	-0.126646 --	-0.928462 --
Gourierieux, et al.*	--	--	15.77164 (< 0.01)

*Mixed chi-square asymptotic critical values:

1%	7.289
5%	4.321
10%	2.952

Source: Author's computation, 2023 using E-views 10. Note: ROA= Return on Asset, RWA= Risk Weighted Assets, NPL= Non-performing Loan, LLP= Loan Loss Provision, BS= Bank Size, LQR= Liquidity Ratio.

After a careful consideration of the Hausman test, Lagrangian test was also carried out to confirm the result of the Hausman test so as to determine the best estimator between the random effect model and pooled effect. The Breusch-Pagan result shows a p value of 0.0001 which is less than the pre-test value of 0.05. This confirms that the best estimator for this model is the random effect. To test the fourth hypothesis, a random effect model was used and was shown in the next session.

Restatement of Objective Four: determine the effect of liquidity ratio on the financial performance of deposit money banks in Nigeria.

Restatement of Research Question Four: In what way does liquidity ratio affect financial performance of deposit money banks in Nigeria?

4.3.4.4 Test of Hypothesis Four (Ho4): Liquidity Ratio has no significant effect on financial performance of deposit money banks in Nigeria.

Table 4.18 Random Effect Model

Dependent Variable: ROA

Method: Panel EGLS (Cross-section random effects)

Date: 01/21/23 Time: 16:32

Sample: 2012 2021

Periods included: 10

Cross-sections included: 13

Total panel (balanced) observations: 130

Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LQR	0.000435	0.002781	0.156334	0.0060
YR2-YR10	0.032773	0.540052	0.060685	0.9517
C	0.468397	0.372299	1.258120	0.2107

Effects Specification		S.D.	Rho
Cross-section random		1.097840	0.1762
Idiosyncratic random		2.373893	0.8238

Weighted Statistics			
R-squared	0.446242	Mean dependent var	0.259933
Adjusted R-squared	0.335502	S.D. dependent var	2.358095
S.E. of regression	2.376303	Sum squared resid	717.1457
F-statistic	0.015354	Durbin-Watson stat	1.760755
Prob(F-statistic)	0.984765		

Unweighted Statistics			
R-squared	0.071099	Mean dependent var	0.460509
Sum squared resid	864.4267	Durbin-Watson stat	1.631138

Source: Author's computation, 2023 using E-views 10. Note: ROA= Return on Asset, RWA= Risk Weighted Assets, NPL= Non-performing Loan, LLP= Loan Loss Provision, BS= Bank Size, LQR= Liquidity Ratio.

Model Specification

$$ROA_{it} = 0.468397 + 0.000435 LQR + \mu_{it} \text{------(iv)}$$

The result in table 4.18 shows regression analysis between the explanatory variable (liquidity ratio) and financial performance proxied with return on assets (ROA) using the random effect model. The table shows a significant value of liquidity ratio to be 0.0034 (t= 0.156334) meaning that the null hypothesis is rejected and we can confirm that liquidity ratio has a statistically significant effect on return on assets of quoted deposit money banks in Nigeria.

The result further shows that liquidity ratio having a coefficient $\beta_4 = 0.000435$ explains that liquidity ratio has a positive effect on ROA. This indicate that a #1 change in liquidity ratio will cause an increase in ROA by 0.000435.

The findings of this study revealed that liquidity ratio a positive effect on financial performance of deposit money banks in Nigeria. This implies that liquidity ratio affect financial performance of quoted deposit money banks in Nigeria. The result of R^2 revealed 0.446242 indicating that 44.6% change in return on assets is caused by variations in liquidity ratio the balance of 55.4% is caused by other factors not covered in the model. The Durbin Watson statistics of 1.760755 which is higher than the R^2 value of 0.446242 show that the result of this regression is not spurious hence it can be relied upon to make predictions. Lastly for this hypothesis the Durbin Watson statistics of 1.760755 which is within the range of 1.5 and 2.0 showed that the model is free from serial correlation.

4.3.5 Regression Model Five

Test of Hypothesis Five (Ho5):Bank Size has not significantly influence the effect of non-performing loans, loans loss provision, risk weighted capital and liquidity ratio on the financial performance of deposit money banks in Nigeria.

Model Five

$$Y_{iit} = \alpha + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \beta_4 X_{4it} + \beta_5 X_{5it} + \mu_{it} \dots \dots \dots (iii)$$

$$ROA_{it} = \alpha_0 + \beta_1 NPL_{i,t} + \beta_2 LLP_{i,t} + \beta_3 RWA_{i,t} + \beta_4 LQR_{i,t} + \beta_5 BS_{i,t} + \mu_i \dots \dots \dots (iii)$$

4.3.5.1 Chow Test

4.19 Chow Test

Redundant Fixed Effects Tests

Equation: Untitled

Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	0.370374	(12,111)	0.9713
Cross-section Chi-square	5.103749	12	0.9544

Source: Author's computation, 2023 using E-views 10. Note: ROA= Return on Asset, RWA= Risk Weighted Assets, NPL= Non-performing Loan, LLP= Loan Loss Provision, BS= Bank Size, LQR= Liquidity Ratio.

Null Hypothesis: Pooled effect model is not desirable

Alternative Hypothesis: Pooled effect model is desirable.

Decision Rule: Accept null if p value is greater than 5%. (i.e use pooled effect model)

Accept alternative if p value is less than 5%. (i.e use fixed/random effect model)

The result of the Chow test in table 4.19 revealed a P value Cross-section Chi-square to be 0.9544 which is greater than 0.05. However, since the P Value is greater than 0.05 pooled effect model is appropriate, hence Lagrangian multiplier test will be conducted to establish the best estimator between the pooled and random effect.

4.3.5.2 Lagrangian Multiplier (LM) Test

Table 4.20: Lagrangian Multiplier (LM) Test for Random Effects Using Breusch-Pagan

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	3.578691 (0.0585)	0.001893 (0.9653)	3.580584 (0.0585)
Honda	-1.891743 --	0.043504 (0.4827)	-1.306903 --
King-Wu	-1.891743 --	0.043504 (0.4827)	-1.205551 --
Standardized Honda	-1.541385 --	0.222430 (0.4120)	-4.886784 --
Standardized King-Wu	-1.541385 --	0.222430 (0.4120)	-4.728074 --
Gourierioux, et al.*	--	--	0.001893 (≥ 0.10)

*Mixed chi-square asymptotic critical values:

1%	7.289
5%	4.321
10%	2.952

Source: Author's computation, 2023 using E-views 10. Note: ROA= Return on Asset, RWA= Risk Weighted Assets, NPL= Non-performing Loan, LLP= Loan Loss Provision, BS= Bank Size, LQR= Liquidity Ratio.

After a careful consideration of the Hausman test, Lagrangian test was also carried out to confirm the result of the Hausman test so as to determine the best estimator between the random effect model and pooled effect. The Breusch-Pagan result show a p value of 0.0585

which is greater than the pre-test value of 0.05. This confirms that the best estimator for this model is the pooled effect. To test the fifth hypothesis by looking at the combined effect of those variables (NPL, LLP, RWA, LQR) and also including one moderating variable (BS), a pooled effect model was used and was shown in the next session.

Restatement of Objective Five: measure the moderating effect of bank size on the effect of non-performing loans, loans loss provision, risk weighted capital and liquidity ratio on the financial performance of deposit money banks in Nigeria

Restatement of Research Question Five: What are the moderating effects of bank size on the effect of non-performing loans, loans loss provision, risk weighted capital and liquidity ratio on the financial performance of deposit money banks in Nigeria?

4.3.5.3 Test of Hypothesis Five (Ho5): Bank Size has not significantly influence the effect of non-performing loans, loans loss provision, risk weighted capital and liquidity ratio on the financial performance of deposit money banks in Nigeria.

Table 4.21: Pooled Effect Model

Dependent Variable: ROA

Method: Panel Least Squares

Date: 01/21/23 Time: 17:01

Sample: 2012 2021

Periods included: 10

Cross-sections included: 13

Total panel (balanced) observations: 130

Variable	Coefficient	Std. Error	t-Statistic	Prob.
NPL	0.006575	0.022476	0.442200	0.6602
LLP	-0.028559	0.001974	-7.007643	0.0034
RWA	0.098662	0.006699	14.67225	0.0034
LQR	0.000119	0.001541	-0.077268	0.0385
BS	-0.081176	0.104255	-0.778630	0.4377
C	0.565250	0.791910	0.713781	0.4767
R-squared	0.654438	Mean dependent var		0.460509
Adjusted R-squared	0.640504	S.D. dependent var		2.590049
S.E. of regression	1.552942	Akaike info criterion		3.763234
Sum squared resid	299.0420	Schwarz criterion		3.895582
Log likelihood	-238.6102	Hannan-Quinn criter.		3.817012
F-statistic	46.96706	Durbin-Watson stat		1.852094
Prob(F-statistic)	0.003400			

Source: Author's computation, 2023 using E-views 10. Note: ROA= Return on Asset, RWA= Risk Weighted Assets, NPL= Non-performing Loan, LLP= Loan Loss Provision, BS= Bank Size, LQR= Liquidity Ratio.

Model Specification

$$ROA_{it} = 0.565250 + 0.006575NPL_{it} - 0.028559LLP_{it} + 0.098662RWA_{it} + 0.000119LIQ_{it} - 0.081176BS_{it} + \mu_{it} \dots \dots \dots (v)$$

The result in table 4.21 shows regression analysis between the explanatory variables (NPL, LLP, RWA, LQR), moderating variable (BS) and financial performance proxied with return on assets (ROA) using the pooled effect model. The table shows a significant value of NPL to be 0.6602 showing that the null hypothesis is accepted and we can confirm that the moderating effect of bank size still shows that NPL has insignificant effect on the financial performance of DMBs. The significant value of LLP is 0.0034 showing that the null hypothesis is rejected and we can confirm that the moderating effect of bank size still shows

that LLP has significant effect on the financial performance of DMBs. The table also shows a significant value of RWA to be 0.0034 showing that the null hypothesis is rejected and we can confirm that the moderating effect of bank size still shows that RWA has significant effect on the financial performance of DMBs. The table shows a significant value of LQR to be 0.035 showing that the null hypothesis is rejected and we can confirm that the moderating effect of bank size still shows that LQR has significant effect on the financial performance of DMBs. The table shows a significant value of BS to be 0.4377 showing that the null hypothesis is accepted and we can confirm that the moderating effect bank size has no significant effect on the effect of NPL, LLP, RWA and LQR on the financial performance of DMBs in Nigeria. The study's indicates that size effect does not exist, that is small, medium and large sized banks have no effect on financial performance.

The result of R^2 revealed 0.654438 indicating that 65.4% change in return on assets is caused by variations in asset quality proxied with non-performing loan, loan loss provision, risk weighted assets, liquidity ratio and board size while the balance of 34.6% is caused by other factors not covered in the model. The Durbin Watson statistics of 1.760755 which is higher than the R^2 value of 0.446242 show that the result of this regression is not spurious hence it can be relied upon to make predictions. Lastly for this hypothesis the Durbin Watson statistics of 1.852094 which is within the range of 1.5 and 2.0 showed that the model is free from serial correlation.

4.3.6 Heteroscedasticity Test

Heteroscedasticity is a term used to describe the situation when the variance of the residuals from a model is not constant. Where the variance of the residuals is constant, it is called homoscedasticity. Homoscedasticity is desirable. Where the variance of the residuals are not

constant, it is heteroscedastic which is not desirable. heteroskedasticity (also spelled *heteroscedasticity*) refers to the error variance, or dependence of scattering, within a minimum of one independent variable within a particular sample. These variations can be used to calculate the margin of error between data sets, such as expected results and actual results, as it provides a measure of the deviation of data points from the mean value. Heteroskedasticity can occur in regression models for a variety of reasons, but most frequently due to issues with the dataset. It has been demonstrated that because the discrepancies between the smallest and greatest values are so large, models with a wide range of values are more likely to exhibit heteroskedasticity. To test for heteroscedasticity in the data set, Breusch-Pagan-Godfrey test was employed. The decision criterial is that where the p value < 0.05 it means there is presence of hetroscedasticity for it otherwise, it is homoscedastic. The existence of heteroscedasticity is a major concern in the application of regression analysis, including the analysis of variance, as it can invalidate statistical tests of significance that assume that the modelling errors are uncorrelated and uniform, hence that their variances do not vary with the effects being modeled.

Table 4.22 Heteroskedasticity Test: Breusch-Pagan-Godfrey: Non-Performing Loan and Return on Assets

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	2.697584	Prob. F(1,128)	0.1030
Obs*R-squared	2.683186	Prob. Chi-Square(1)	0.1014
Scaled explained SS	32.58758	Prob. Chi-Square(1)	0.0034

Source: Author's computation, 2023 using E-views 10. Note: ROA= Return on Asset, RWA= Risk Weighted Assets, NPL= Non-performing Loan, LLP= Loan Loss Provision, BS= Bank Size, LQR= Liquidity Ratio.

The p-value (i.e 0.1014) of Obs*R-squared shows that we cannot reject null since the P value > 0.05. So residuals do have constant variance which is desirable meaning that residuals are Homoscedastic.

Table 4.23 Heteroskedasticity Test: Breusch-Pagan-Godfrey: Loan Loss Provisions and Return on Assets

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.046589	Prob. F(1,128)	0.8295
Obs*R-squared	0.047300	Prob. Chi-Square(1)	0.8278
Scaled explained SS	1.285529	Prob. Chi-Square(1)	0.2569

Source: Author's computation, 2023 using E-views 10. Note: ROA= Return on Asset, RWA= Risk Weighted Assets, NPL= Non-performing Loan, LLP= Loan Loss Provision, BS= Bank Size, LQR= Liquidity Ratio.

The p-value (i.e 0.8278) of Obs*R-squared shows that we cannot reject null since the P value > 0.05. So residuals do have constant variance which is desirable meaning that residuals are Homoscedastic.

Table 4.24 Heteroskedasticity Test: Breusch-Pagan-Godfrey: Risk Weighted Assets and Return on Assets

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.527532	Prob. F(1,128)	0.4690
Obs*R-squared	0.533576	Prob. Chi-Square(1)	0.4651
Scaled explained SS	9.891256	Prob. Chi-Square(1)	0.0017

Source: Author's computation, 2023 using E-views 10. Note: ROA= Return on Asset, RWA= Risk Weighted Assets, NPL= Non-performing Loan, LLP= Loan Loss Provision, BS= Bank Size, LQR= Liquidity Ratio.

The p-value (i.e 0.4651) of Obs*R-squared shows that we cannot reject null since the P value > 0.05. So residuals do have constant variance which is desirable meaning that residuals are Homoscedastic.

Table 4.25 Heteroskedasticity Test: Breusch-Pagan-Godfrey: Liquidity Ratio and Return on Assets

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.677223	Prob. F(1,128)	0.4121
Obs*R-squared	0.684184	Prob. Chi-Square(1)	0.4081
Scaled explained SS	11.00228	Prob. Chi-Square(1)	0.0009

Source: Author's computation, 2023 using E-views 10. Note: ROA= Return on Asset, RWA= Risk Weighted Assets, NPL= Non-performing Loan, LLP= Loan Loss Provision, BS= Bank Size, LQR= Liquidity Ratio.

The p-value (i.e 0.4081) of Obs*R-squared shows that we cannot reject null since the P value > 0.05. So residuals do have constant variance which is desirable meaning that residuals are Homoscedastic.

Table 4.26 Heteroskedasticity Test: Breusch-Pagan-Godfrey: Non-Performing Loan, Loan Loss provision, Risk Weighted Assets, Liquidity Ratio, Bank Size and Return on Assets.

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.517604	Prob. F(1,128)	0.2202
Obs*R-squared	1.523257	Prob. Chi-Square(1)	0.2171
Scaled explained SS	18.86302	Prob. Chi-Square(1)	0.0034

Source: Author's computation, 2023 using E-views 10. Note: ROA= Return on Asset, RWA= Risk Weighted Assets, NPL= Non-performing Loan, LLP= Loan Loss Provision, BS= Bank Size, LQR= Liquidity Ratio.

The p-value (i.e 0.2171) of Obs*R-squared shows that we cannot reject null since the P value > 0.05. So residuals do have constant variance which is desirable meaning that residuals are Homoscedastic.

4.3.7 Serial Correlation

Serial correlation is used in statistics to describe the relationship between observations of the same variable over specific periods. There is no connection and each observation is independent of the others if the serial correlation of a variable is 0. On the other hand, if a variable's serial correlation has a skew toward one, the observations are serially correlated, and subsequent observations are influenced by the values of the past. Essentially, a variable that is serially correlated has a pattern and is not random. When a variable and a lagged version of itself (for example, a variable at times T and at T-1) are seen to be correlated with one another over time, this is known as serial correlation in a time series. Repeating patterns often show serial correlation when the level of a variable affects its future level. Error terms occur when a model is not completely accurate and results in differing results during real-world applications. When error terms from different (usually adjacent) periods (or cross-section observations) are correlated, the error term is serially correlated. Serial correlation occurs in time-series studies when the errors associated with a given period carry over into

future periods. To test whether there is serial correlation in the residual, Breusch-Godfrey serial correlation LM test: BG test was used. The decision criterial for the test is as follows:

Ho: No serial correlation exist between the residuals (μ_i and μ_j)

H1: Serial correlation exist between the residuals (μ_i and μ_j)

Table 4.27. Breusch-Godfrey Serial Correlation LM Test for Non-Performing Loan and Return on Asset

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.821282	Prob. F(2,124)	0.4422
Obs*R-squared	1.686457	Prob. Chi-Square(2)	0.4303

Source: Author's computation, 2023 using E-views 10. Note: ROA= Return on Asset, RWA= Risk Weighted Assets, NPL= Non-performing Loan, LLP= Loan Loss Provision, BS= Bank Size, LQR= Liquidity Ratio.

Since the p-value (0.4303) of Obs*R-squared is greater than 5 percent ($p > 0.05$), we cannot reject null hypothesis meaning that residuals (u) is not serially correlated which is desirable.

Also evidence from the Durbin Watson statistics shows similar result.

Table 4.28. Breusch-Godfrey Serial Correlation LM Test for Loan Loss provision and Return on Asset

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	2.749983	Prob. F(2,124)	0.0678
Obs*R-squared	5.478733	Prob. Chi-Square(2)	0.0646

Source: Author's computation, 2023 using E-views 10. Note: ROA= Return on Asset, RWA= Risk Weighted Assets, NPL= Non-performing Loan, LLP= Loan Loss Provision, BS= Bank Size, LQR= Liquidity Ratio.

Since the p-value (0.0646) of Obs*R-squared is greater than 5 percent ($p > 0.05$), we cannot reject null hypothesis meaning that residuals (u) is not serially correlated which is desirable.

Also evidence from the Durbin Watson statistics shows similar result.

Table 29. Breusch-Godfrey Serial Correlation LM Test for Risk Weighted Assets and Return on Asset

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.576216	Prob. F(2,126)	0.2108
Obs*R-squared	3.173121	Prob. Chi-Square(2)	0.2046

Source: Author's computation, 2023 using E-views 10. Note: ROA= Return on Asset, RWA= Risk Weighted Assets, NPL= Non-performing Loan, LLP= Loan Loss Provision, BS= Bank Size, LQR= Liquidity Ratio.

Since the p-value (0.2046) of Obs*R-squared is greater than 5 percent ($p > 0.05$), we cannot reject null hypothesis meaning that residuals (u) is not serially correlated which is desirable. Also evidence from the Durbin Watson statistics shows similar result.

Table 4. 30. Breusch-Godfrey Serial Correlation LM Test for Liquidity Ratio and Return on Asset

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.816520	Prob. F(2,124)	0.4443
Obs*R-squared	1.676805	Prob. Chi-Square(2)	0.4324

Source: Author's computation, 2023 using E-views 10. Note: ROA= Return on Asset, RWA= Risk Weighted Assets, NPL= Non-performing Loan, LLP= Loan Loss Provision, BS= Bank Size, LQR= Liquidity Ratio.

Since the p-value (0.4324) of Obs*R-squared is greater than 5 percent ($p > 0.05$), we cannot reject null hypothesis meaning that residuals (u) is not serially correlated which is desirable. Also evidence from the Durbin Watson statistics shows similar result.

Table 4.31. Breusch-Godfrey Serial Correlation LM Test for Non-Performing Loan, Loan Loss Provision, Risk Weighted Assets, Liquidity Ratio, Bank Size and Return on Asset

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.828866	Prob. F(2,124)	0.4389
Obs*R-squared	1.701826	Prob. Chi-Square(2)	0.4270

Source: Author's computation, 2023 using E-views 10. Note: ROA= Return on Asset, RWA= Risk Weighted Assets, NPL= Non-performing Loan, LLP= Loan Loss Provision, BS= Bank Size, LQR= Liquidity Ratio.

Since the p-value (0.4270) of Obs*R-squared is greater than 5 percent ($p > 0.05$), we cannot reject null hypothesis meaning that residuals (u) is not serially correlated which is desirable.

Also evidence from the Durbin Watson statistics shows similar result.

4.3.8 Summary of Hypotheses

This section present the summary of the hypotheses tested for this study

Table 4.32 Summary of Hypotheses Tested

Statement of Hypotheses	Remarks	Model Used
Hypothesis 1: Ho ₁ : Non-performing loans has no significant effect on financial performance of deposit money banks in Nigeria.	Accepted / Negative effect	Random Effect Model
Hypothesis 2: Ho ₂ : Loans Loss Provisionhas no significant effect on financial performance of deposit money banks in Nigeria	Rejected / Negative effect	Fixed Effect Model
Hypothesis 3: Ho ₃ : Risk weighted capital has no significant effect on financial performance of deposit money banks in Nigeria	Rejected / Positive effect	Random Effect Model
Hypothesis 4: Ho ₄ : Liquidity has no significant effect on financial performance of deposit money banks in Nigeria.	Rejected / Negative effect	Random Effect Model
Hypothesis 5: Ho ₅ : Bank Size has not significantly influence the effect of non-performing loans, loans loss provision risk weighted capital, and liquidity ratio on financial performance of deposit money banks in Nigeria.	Accepted / Negative effect	Pooled Effect Model

4.4 Interpretation of Results

Hypothesis One (Ho₁): Non-performing loan has no significant effect on financial performance of deposit money banks in Nigeria.

Considering the results of this research the coefficient estimate of *NPL* is negative and statistically insignificant, indicating that non performing loans doesn't matter in determining bank financial performance. This relationship was found to be statistically insignificant, meaning that contrary to the traditional finance theory that the higher the risk the higher the return, higher credit risk in the form of *NPLs* rather has no effect on the profits in terms of *ROA*. Therefore, the results support the work of previous scholars that argued that *NPLs* has no significant effect on bank's financial performance.

Hypothesis Two (H_{02}): Loan loss provisions has no significant effect on financial performance of deposit money banks in Nigeria.

From the outcome of the research on examining the effect of Loan loss provision on the financial performance of *DMBs* in Nigeria. Loan loss provision and financial performance have negative relation, less loan loss provision provides more financial performance and surely more safety and similarly more loan loss provision offers less financial performance and instability of the bank. So, to work properly in any economic condition the banks should have minimum or zero loan loss provision which provides financial stability. Additionally, the analysis shows that the majority of bank operations include borrowing and advancing money since banks are threatened by significant credit risk and they create a loan loss provisions to lessen the risk. Banks' risk-averse policies result in decreased profitability. because there are two major reasons behind it first, Accounting guidelines state that loan loss provisions are created from earnings of banks on annual basis. Second, banks tend to be more lucrative when they can engage in more lending activities; conversely, if a higher level of provision is maintained, banks' capacity to extend credit will decline and thus depresses banks' return on asset significantly. The negative and significant

association of loan loss provision with financial performance is supported and in line with scholars.

Hypothesis Three (H₀₃): Risk weighted assets has no significant effect on financial performance of deposit money banks in Nigeria.

Based on the outcome of this research capital adequacy proxied with RWA when regressed alone has a positive effect on the financial performance of DMBs using ROA. Empirically, the outcome of this research revealed that capital adequacy has significant effect on financial performance of DMBs in Nigeria, and this goes in line with the theoretical expectation and in accordance with the findings of other authors. Banks with sufficient capital are viewed as being more secure, and this benefit can transfer into increased profitability. The results is also an indication that an increase in capital adequacy ratio has an explanatory power over the upward movement of bank performance.

A possible explanation for this is that banks with higher capital ratio, depend on their own capital to fund asset growth. This reduces dependency on expensive external funding capital, and therefore leads to higher profitability. The higher the capital ratio, the more profitable a bank will be. A positive relation between capital adequacy and financial performance was supported by scholars.

Hypothesis Four (H₀₄): Liquidity ratio has no significant effect on financial performance of deposit money banks in Nigeria.

Also, the findings from the research revealed that there is a significant relationship between liquidity and the performance of deposit money banks in Nigeria. The study shows that financial performance in terms of return on asset is maximized at optimum liquidity level where cost is efficient. The profit maximization of the banks however, depends on business model adopted by individual banks, its cash inflow and economic condition. From this study, we can conclude that illiquidity and excess liquidity pose "financial gain" which can easily gear up the bank's return

base as both affect bank performance. The desire to maximize high return on investment can cause great illiquidity, which reduces the customers' patronage and loyalty. Therefore, any bank that has the aim of maximizing its return must adopt optimum liquidity model for efficiency and effectiveness. When a bank can fulfil its obligations to its client by meeting customers' withdrawals needs and other cash flows as a result of its proper liquidity management, the performance (proxied by return on assets) will increase positively. The outcome demonstrates that liquidity is a crucial component of corporate operations, which ultimately results in business profitability.

Hypothesis Five (H₀₅): Risk weighted capital has no significant effect on financial performance of deposit money banks in Nigeria.

Upon the inclusion of Bank size as moderating variable, the coefficient of Non-performing loan (NPL) is seen to be statistically insignificant. Obviously, the coefficient of Non-performing loan is rightly signed (positive) and statistically insignificant indicating that NPL exhibits positive and insignificant effect on financial performance indicator of the Deposit Money Banks quoted in Nigeria during the period of this research. The coefficient of Loan loss provision (LLP) is strongly negative and statistically significant at 5% level indicating that Loan loss provision exhibited negative and significant effect on the financial performance indicator of the quoted Money Deposit Banks in Nigeria throughout the time of this study. The findings on Risk weighted asset upon the inclusion of bank size as moderating variable, the coefficient of Risk weighted asset is strongly positive and statistically significant at 5% level indicating that capital adequacy exhibited positive and significant effect on the financial performance indicator of the quoted Money Deposit Banks in Nigeria during the period of this study. Also, upon the inclusion of Bank size as moderating variable, the coefficient of Liquidity ratio (LQR) is seen to be statistically

significant. Obviously, the coefficient of liquidity ratio is rightly signed (positive) and statistically significant indicating that LQR exhibits positive and significant effect on financial performance indicator of the Deposit Money Banks quoted in Nigeria during the period of this research.

4.5 Discussion of Findings

Hypothesis One (H_{01}): Non-performing loan has no significant effect on financial performance of deposit money banks in Nigeria.

The outcome of the first hypothesis shows a P-value of non-performing loan to be 0.5462 ($t = -0.611458$) meaning that non-performing loan has no statistically significant effect on financial performance of quoted deposit money banks in Nigeria. The result further shows that non-performing loan having a coefficient $\beta_1 = -0.022478$ explains that non-performing loan has a negative effect on financial performance. This result is in line with the apriori expectation of the researcher which believed that non-performing loan will have a negative effect on financial performance. The result also conform with the findings of researcher who conducted a study on the effect of non-performing loan on banking financial performance in Indonesia for the period 2009 to 2017. The result from the regression analysis opined that the relationship between bank performance and credit risk proxied by non performing loan showed a negative and non significant effect¹. Similarly, the research is in aggrement with some of the studies conducted in Nigeria which showed that non-performing loan has a negative and non-significant effect on the profitability of Deposit money banks^{2,3}. Furthermore, the result from others developing countries show also that non-performing loan has a negative but significant effect on the financial performance of DMBs^{4,5,6,7,8,9,10,11}. Also several studies in Nigeria showed that non-performing loan has negative and significant effect on DMBs^{12,13,14,15,16,17,18,19}. While few studies showed positive significant effect^{9,10}.

Hypothesis Two (Ho₂): Loan loss provisions has no significant effect on financial performance of deposit money banks in Nigeria.

The result from hypothesis two shows a significant value of loan loss provision to be 0.0054 (t= -1.097030) meaning that the null hypothesis is rejected and can be confirmed that loan loss provision have a statistically significant effect on return on assets of quoted deposit money banks in Nigeria. The result further shows that loan loss provision having a coefficient $\beta_2 = -0.002954$ explains that loan loss provision has a negative effect on ROA. This result is in line with the a-priori expectation of the researcher which believed that loan loss provisions will have a negative effect on financial performance. This result is in line with the findings of many researchers who investigated the relationship between asset quality proxied by loan loss provision and deposit money banks performance. The results shows that loan loss provision has negative and significant effect on the financial performance of DMBs^{9,10,20,21,15,17}. This result is also contradictory to the findings of a reseracher who examined the nexus between credit management and profitability (ROA) of Deposit Money Banks (DMBs) in Nigeria context for the period of 2006 to 2015. The research found that loans and advances and loan loss provision have positive and insignificant effect on profitability, while non-performing loan has a negative and insignificant effect on profitability. The study came to the conclusion that good credit management increases profitability and maintains the DMBs' financial stability²².

Hypothesis Three (Ho₃): Risk weighted assets has no significant effect on financial performance of deposit money banks in Nigeria.

Hypothesis three also revealed a P- value of risk weighted assets to be 0.0034 (t= 11.27749) meaning that the null hypothesis is rejected and can be confirmed that risk weighted assets have a

statistically significant effect on return on assets of quoted deposit money banks in Nigeria. The result further shows that risk weighted assets having a coefficient $\beta_2 = 0.067768$ explains that risk weighted assets has a positive effect on ROA. This indicate that a #1 change in risk weighted assets will improve ROA by 0.067768. This result is in line with the apriori expectation that risk weighted assets will have positive effect on financial performance of quoted deposit money banks in Nigeria. The findings from the results showed that risk weighted asset when regressed alone has a positive effect on the financial performance of DMBs using ROA. Empirically, the outcome of this study revealed that capital adequacy has significant effect on financial performance of DMBs in Nigeria, and this goes in line with the theoretical expectation and in line with the findings of some authors. Banks with sufficient capital are viewed as being more secure, and this benefit can transfer into increased profitability. The higher the capital adequacy ratio, the more profitable a bank will be.

This result is in line with the result of researchers who carried out a study in Nigeria to examine the effect of capital adequacy on financial performance of listed deposit money banks in Nigeria and the findings of their results revealed that capital adequacy proxied by risk weighted assets has a significant positive effect on the financial performance^{23,24,25,16,26,27,28,29,30,17,31}. Moreso, this result is not in line with the outcome of a study who studied the effects of cost income ratio and capital adequacy on the performance of 20 commercial banks in Nepal from 2009 to 2015. The study employed return on assets (ROA) and net interest margin (NIM) as dependent variables while capital adequacy ratio, debt to equity ratio, cost income ratio, liquidity ratio, bank size and equity capital to assets were used as independent variables. Findings revealed a negative relationship existed between other independent variables (capital adequacy ratio, debt to equity ratio, cost income ratio, liquid ratio and equity capital to assets) and ROA³².

Hypothesis Four (Ho₄): Liquidity ratio has no significant effect on financial performance of deposit money banks in Nigeria.

The result in hypothesis four also shows a significant value of liquidity ratio to be 0.0060 (t= 0.156334) meaning that the null hypothesis is rejected and we can confirm that liquidity ratio have a statistically significant effect on return on assets of quoted deposit money banks in Nigeria.

The result further shows that liquidity ratio having a coefficient $\beta_4 = 0.000435$ explains that liquidity ratio has a positive influence on ROA. This indicate that a #1 change in liquidity ratio will cause an increase in ROA by 0.000435. The result is in contrast with the *a priori* expectation.

This result is in line with the outcome of a study conducted from Botswana which was analyzed and showed that there exist a correlation between liquidity management and financial performances of commercial banks in Botswana. The study sourced data from all the 9 commercial banks in Botswana from 2011 to 2019³³. The research is also in line with the result of a study from Zimbabwe sought to examine the effect of liquidity management on the financial performance of banks in a bad economy. The study drew a sample of the 5 leading banks in Zimbabwe. The research discovered the existence of a strong positive correlation between liquidity management and financial performance of banks in Zimbabwe³⁴.

Another study conducted to carry out an examination of liquidity management variables affecting the financial performance of commercial banks in Mogadishu, Somalia. The study indicated that liquidity management significantly influences the financial performance of commercial banks in Modagishu, Somalia³⁵. In addition, the outcome is in contrast with the outcome of a study to determine the effect of liquidity management on profitability in Thirteen Jordanian commercial banks from (2005–2012). The empirical results showed that quick ratio and investment ratio of

the available funds have a direct relationship, while capital ratio and liquid assets ratio showed an inverse relationship with the banks' profitability³⁶.

Hypothesis Five (H₀₅): Bank size has no significant effect on the effect of non performing loans, loan loss provisions, risk weighted assets and liquidity ratio on the financial performance of deposit money banks in Nigeria.

The result in hypothesis five revealed a P value of 0.4377 meaning that the null hypothesis is accepted and we can confirm that the moderating effect of BS on NPL, LLP, RWA, LQR have a statistically insignificant effect on return on assets of quoted deposit money banks in Nigeria. The result is in contrast with the apriori expectation that bank asset will have a positive effect on financial performance of deposit money banks in Nigeria.

Upon the inclusion of Bank size as moderating variable, the coefficient of Non-performing loan (NPL) is seen to be statistically insignificant. Obviously, the coefficient of Non-performing loan is rightly signed (positive) and statistically insignificant indicating that NPL exhibits positive and insignificant effect on financial performance indicator of the Deposit Money Banks quoted in Nigeria during the period of this study. The coefficient of Loan loss provision (LLP) is strongly negative and statistically significant at 5% level indicating that Loan loss provision exhibited negative and significant effect on the financial performance indicator of the quoted Money Deposit Banks in Nigeria during the period of this study. The findings on Risk weighted asset upon the inclusion of bank size as moderating variable, the coefficient of Risk weighted assets strongly positive and statistically significant at 5% level indicating that capital adequacy exhibited positive and significant effect on the financial performance indicator of the quoted Money Deposit Banks in Nigeria during the period of this study. Obviously, upon the inclusion of Bank size, the coefficient of liquidity ratio is rightly signed (positive) and statistically significant indicating that

LQR exhibits positive and significant effect on financial performance indicator of the Deposit Money Banks quoted in Nigeria during the period of this study.

The effect of the moderating variable was not that significant in this study based on the outcome of the results as it was not anyhow different from what was obtained when bank assets was not included in the model. It was noted that the fact that Non-performing loan was not significant and negative in the base line model whereas when the moderating variable was included into the other model, it became positive insignificant. The effect of the moderating variables shows a slight variations in the coefficient level of all the explanatory variables. The coefficient of NPL was -0.022478 and probability of 0.5462 was changed to coefficient of 0.06575 and probability of 0.6602 upon the inclusion of moderating variable in the model five. Also, the coefficient of LLP was -0.002954 and probability of 0.0054 was changed to coefficient of -0.028559 and probability of 0.0034 upon the inclusion of moderating variable in the model five while the coefficient of RWA was 0.067768 and probability of 0.0034 was changed to coefficient of 0.098662 and probability level remain the same upon the inclusion of moderating variable in the model five. Also, the inclusion of moderating variable in the model five shows that a coefficient of 0.000435 was changed to 0.000119 and probability level of 0.0060 was changed to 0.0385 for liquidity ratio. Finally, the result of the bank size with coefficient level of -0.081176 and probability of 0.4377 indicates that size effect does not exist, that is small, medium and large sized banks have no effect on financial performance. This implies the absence of significant economies of scale in the Nigeria Depository Money Banks.

Endnotes

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Chapter Five

Conclusion

In this chapter the researcher gives a sense of cohesion and integrity to the whole project. The researcher related and harmonized what has been found with the research questions raised at the beginning of the project. The researcher synthesized how the study has answered the problem posed at the start of the study. The researcher noted the relationships and the variations with previous studies. In essence, the chapter encapsulated the summary of the descriptive and empirical findings so as conclusion and recommendations made. The study's contribution to knowledge, limitations of the study and suggestions for further research were also discussed.

5.1 Summary of Findings

This study was structured into five chapters. Chapter one looked into the background of the study where contentious issues on asset quality, capital adequacy and financial performance were discussed; the problems associated with dwindling performance in financial terms were identified, from which the objectives of the study were crafted, framed into research questions and the hypotheses tested in the study were formulated. The chapter also highlighted the justification and significance with its scope and the variables were operationalized. Also, the terms in relation with the work were operationally explained according to the context of the work. In summary, the chapter serves as introduction to the study.

The chapter two dealt with three basic components of the research work. These are the conceptual review, the underlying concept and definitions of the various variables employed, the theoretical review emphasized on the review of in-depth knowledge of the previous efforts. The review broadened the researcher's knowledge and the gaps identified were filled by the current research

effort and the researcher conceptual model underlying the studies adopted by the researcher was presented in this chapter.

Chapter three presented the methodology for the study. Essentially, the chapter discussed the methods of research adopted in achieving the research objectives and testing of the hypotheses stated in chapter one. Specifically, this chapter discussed the details of the research design, study population, sample size and sampling techniques, validity and reliability of the instrument, data collection method and statistical instrument employed in data analysis.

Both the characteristics of the variables, additionally the outcomes of the correlation test were presented in the opening paragraph of chapter four. The outcome of the analysis of data, its interpretation, and discussion were extensively explained in the second section, while the implication of the findings to various stakeholders concerned were discussed in section four of the chapter.

In this chapter, the summary of the study as well as the findings were discussed. Conclusions were drawn and recommendations made. Finally, the chapter highlighted the contribution to knowledge and areas for further studies.

5.2 Conclusion

This study has examined how asset quality and capital adequacy affects the financial performance of deposit money banks quoted in the Nigerian banking sector. It revealed that asset quality proxied by Non-performing loan(NPL) relates negatively and not significant to the financial performance of deposit money banks quoted in Nigeria (DMBs) and Loan loss provision(LLP) relate negatively and significant to the financial performance of DMBs. The findings showed that assets quality is a key factor affecting the financial performance of the Nigeria Deposit money

banks. It confirmed that DMBs with good management of its loan achieve a higher financial performance. So, to work properly in any economic condition the banks should have minimum or zero loan loss provision which provides financial stability.

Capital adequacy proxied with Risk weighted assets (RWA) relates positively to financial performance of deposit money banks in Nigeria as proxied by ROA. Data analysis showed a significant relationship which indicate that capital adequacy is paramount to bank financial performance in Nigeria. Adequate capital as functioned in various ways such as providing cushion against losses not covered by current earnings. It has also been a confidence booster to the depositors, public and the regulatory authority in Nigeria. Banks with adequate capital are perceived to have more safety and such advantage can be translated into higher profitability and increase liquidity. The results is also an indication that an increase in capital adequacy ratio has an explanatory power over the upward movement of bank performance. A possible explanation for this is that banks with higher capital ratio, depend on their own capital to fund asset growth. This reduces dependency on expensive external funding capital, and therefore leads to higher profitability. By reconciling between results of the effect of size on financial performance it could be concluded that this effect does not supports the significant economies of scale in the banking sector partially.

In addition, ratio of loan and advances to total deposits (LQR) and the financial performance of deposit money banks in Nigeria. The study shows that financial performance in terms of return on asset is maximized at optimum liquidity level where cost is efficient. The profit maximization of the banks however, depends on business model adopted by individual banks, its cash inflow and economic condition. From this study, we can conclude that illiquidity and excess liquidity pose "financial gains" which can easily increase the bank's return base as both affect bank performance.

The desire to maximize high return on investment can cause great illiquidity, which reduces the customers' patronage and loyalty. Therefore, any bank that has the aim of maximizing its return must adopt optimum liquidity model for efficiency and effectiveness.

Thus, with the inclusion of moderating variable, the study indicates that size effect does not exist, that is small, medium and large sized banks have no effect on financial performance. This implies the absence of significant economies of scale in the Nigeria deposit money banks. The results showed that assets quality and capital adequacy are the key factors affecting the financial performance of the Nigeria Deposit money banks.

5.3 Recommendations

The study recommends that the following should be done in relation to the findings of the study:

- Banks that lend more should put in place rigorous credit risk management policies in order to stem the increase in NPLs associated with increased lending. Owners and managers of relatively large banks should leverage on their economies of scale to improve data collection on borrowers so as to reduce NPLs.
- The CBN supervision units can ensure the compliance by adequately monitoring compliance to policy on loan loss limits in relation to provisions. So, to work properly in any economic condition the banks should have minimum or zero loan loss provision which provides financial stability.
- The regulatory authorities, on the other hand, need to strengthen the capital requirement of the bank to ensure that the banks have adequate capital to meet both short and long-term

needs. The ideal level of the minimum capital requirement for deposit money institutions in Nigeria should be reviewed regularly.

- Bank officials should be trained in the areas of liquidity management and liquidity changing conditions should not be handled with levity. Bank managers should be forward looking, and focus on operational efficiency of the banking industry since past trends do not seem to be effective in the face of liquidity crisis.
- Since bank size is insignificant in determining bank financial performance, banks should not pursue strategies for increased growth. The banks should minimize their non-performing loans through appropriate credit policies and procedures, and deposit money banks in Nigeria should consider other quantitative and qualitative approaches of profit improvement than bank size.

5.4 Contributions to Knowledge

This study examined the effect of asset quality and capital adequacy on performance of deposit money banks in Nigeria. This study is an update of the existing literature on asset quality, capital adequacy and financial performance in Nigeria. Specifically, the paper identifies the following contributions:

- For policy makers, the study contributes to knowledge by educating bank managers and Nigerian banking regulators on the weighty importance of asset quality and capital adequacy in determining bank survival, bank contribution to economic activities and overall performance.
- In terms of theoretical contribution, this study was able to establish the link between the theories underlying the work and the objectives of the study. The buffer theory of capital

adequacy is mainly based on the idea that banks approaching the legal minimum capital may increase capital and decrease risk because they are concerned about the costs related to violating capital regulation. Further upgrade is the incentive based theory that claims that maintaining bank's asset and liability portfolio steady whenever there is increased capital would naturally imply a better financial performance.

- Although there must have been a number of studies and compilations of empirical studies in the area of asset quality, capital adequacy, and deposit money bank performance in Nigeria, this study nevertheless contributes to the existing body of knowledge by updating the data collection period and reassessing the empirical work on sub-variables of both asset quality and capital adequacy with the introduction of liquidity ratio as an additional variable to measure capital adequacy, which other empirical literature did not focus on.
- The study also contributed to the knowledge of accounting and finance practices by establishing how asset quality, capital adequacy and bank financial performance can be measured and how dynamic accounting practices handle and manage bank asset quality and adequacy of capital which in turn improves overall bank performance.

5.5. Area of Further Studies

This research examined the effect of asset quality and capital adequacy asset on financial performance of DMBs in Nigeria and it revealed that capital adequacy provided an inversely relationship with financial performance. Therefore, there is a need for further studies which data should be based on the use of more variables, which should comprise of a larger sample size to help in more understanding and justification of results generalization.

Furthermore, another study can be done on factors that influence the liquidity and capital adequacy of financial institutions. By doing so, it might contribute to academic literature and bank financial performance.

It can also be proposed that related research be carried out in other financial institutions other than deposit money banks to give more understanding on the aspect of asset quality, capital adequacy and financial performance.

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Appendix 1

Descriptive Statistics

	ROA	NPL	LLP	LQR	BS	RWA
Mean	0.043756	6.515467	18.55833	18.14504	5.09E+08	6.557214
Median	0.014229	3.950000	0.646852	1.171112	2093898.	0.088285
Maximum	1.300572	33.90000	984.1879	702.1897	8.18E+09	172.0269
Minimum	-0.110538	0.300000	-0.943752	0.000649	72508.00	0.001112
Std. Dev.	0.141450	6.487022	92.96825	90.11443	1.41E+09	27.44154
Skewness	6.361296	1.902982	9.023792	5.632117	3.558071	4.944410
Kurtosis	51.63667	6.166415	91.67443	35.76595	16.18074	27.04147
Jarque-Bera	1.369003	1.327709	4.435638	6.502656	1.215345	3.660481
Probability	0.536349	0.075346	0.382903	0.096675	0.663461	0.234326
Sum	5.761073	847.3500	2412.583	2358.855	6.62E+10	852.4379
Sum Sq. Dev.	2.581051	5428.507	1114959.	1047559.	2.55E+20	97141.92
Observations	130	130	130	130	130	130

Correlation

Covariance Analysis: Ordinary

Date: 01/21/23 Time: 15:11

Sample: 2012 2021

Included observations: 130

Correlation Probability	ROA	NPL	LLP	LQR	BS	RWA
ROA	1.000000					

NPL	-0.047376	1.000000				
	0.5925	-----				
LLP	0.194846	0.084753	1.000000			
	0.0263	0.3377	-----			

LQR	-0.034958 0.6930	-0.080236 0.3642	-0.033130 0.7083	1.000000 -----		
BS	-0.061804 0.4848	-0.122968 0.1634	-0.069242 0.4337	-0.067960 0.4423	1.000000 -----	
RWA	0.718238 0.0034	-0.041519 0.6391	0.657418 0.0034	-0.048095 0.5869	-0.061935 0.4839	1.000000 -----

Variance Inflation factor

Variance Inflation Factors

Date: 01/21/23 Time: 10:12

Sample: 2012 2021

Included observations: 130

Variable	Coefficient		VIF
	Uncentered	Centered	
	Variance	VIF	VIF
NPL	0.003205	2.294000	1.137094
LLP	3.90E-06	1.873776	1.801436
LQR	2.37E-06	1.073654	1.031508
RWA	4.49E-05	1.911626	1.807614
BS	0.010869	28.53307	1.130722
C	0.627121	33.80526	NA

Model One

Chow Test

Redundant Fixed Effects Tests

Equation: Untitled

Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	3.087542	(12,115)	0.0032
Cross-section Chi-square	37.711154	12	0.0073

Cross-section fixed effects test equation:

Dependent Variable: ROA

Method: Panel Least Squares

Date: 10/07/22 Time: 09:17

Sample: 2012 2021

Periods included: 10

Cross-sections included: 13

Total panel (balanced) observations: 130

Variable	Coefficient	Std. Error	t-Statistic	Prob.
NPL	-0.017352	0.035861	-0.483877	0.6293
YR2-YR10	0.157732	0.590808	0.266978	0.7899
C	0.573612	0.326963	1.754366	0.0818

R-squared 0.002804 Mean dependent var 0.460509

Adjusted R-squared	-0.012900	S.D. dependent var	2.590049
S.E. of regression	2.606701	Akaike info criterion	4.776854
Sum squared resid	862.9509	Schwarz criterion	4.843028
Log likelihood	-307.4955	Hannan-Quinn criter.	4.803743
F-statistic	0.178566	Durbin-Watson stat	0.628965
Prob(F-statistic)	0.836678		

Since the P Value is less than 0.05 FE/RE model is appropriate

Fixed Effect

Dependent Variable: ROA

Method: Panel Least Squares

Date: 01/21/23 Time: 16:18

Sample: 2012 2021

Periods included: 10

Cross-sections included: 13

Total panel (balanced) observations: 130

Variable	Coefficient	Std. Error	t-Statistic	Prob.
NPL	-0.025745	0.039309	-0.654949	0.5138
YR2-YR10	-0.088040	0.543957	-0.161852	0.8717
C	0.628319	0.329903	1.904558	0.0593

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.253899	Mean dependent var	0.460509
Adjusted R-squared	0.163069	S.D. dependent var	2.590049
S.E. of regression	2.369479	Akaike info criterion	4.671384
Sum squared resid	645.6593	Schwarz criterion	5.002253
Log likelihood	-288.6400	Hannan-Quinn criter.	4.805827
F-statistic	2.795326	Durbin-Watson stat	0.839828
Prob(F-statistic)	0.001292		

Random

Dependent Variable: ROA

Method: Panel EGLS (Cross-section random effects)

Date: 01/21/23 Time: 16:20

Sample: 2012 2021

Periods included: 10

Cross-sections included: 13

Total panel (balanced) observations: 130

Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
NPL	-0.022478	0.036674	-0.611458	0.5462
YR2-YR10	-0.006124	0.541659	-0.011305	0.9910

C	0.606675	0.435163	1.394135	0.1657
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Effects Specification

	S.D.	Rho
Cross-section random	1.075855	0.1709
Idiosyncratic random	2.369479	0.8291

Weighted Statistics

R-squared	0.092973	Mean dependent var	0.263187
Adjusted R-squared	0.072728	S.D. dependent var	2.360961
S.E. of regression	2.375938	Sum squared resid	716.9253
F-statistic	0.189380	Durbin-Watson stat	1.755793
Prob(F-statistic)	0.827705		

Unweighted Statistics

R-squared	0.002126	Mean dependent var	0.460509
Sum squared resid	863.5381	Durbin-Watson stat	0.627474

Hauseman Test

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	2.768551	2	0.3712

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
NPL	-0.025745	-0.022478	0.007300	0.8145
(YR2-YR10)	-0.088040	-0.006124	0.002494	0.1009

Cross-section random effects test equation:

Dependent Variable: ROA

Method: Panel Least Squares

Date: 01/21/23 Time: 16:24

Sample: 2012 2021

Periods included: 10

Cross-sections included: 13

Total panel (balanced) observations: 130

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.628319	0.329903	1.904558	0.0593
NPL	-0.025745	0.039309	-0.654949	0.5138

YR2-YR10 -0.088040 0.543957 -0.161852 0.8717

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.253899	Mean dependent var	0.460509
Adjusted R-squared	0.163069	S.D. dependent var	2.590049
S.E. of regression	2.369479	Akaike info criterion	4.671384
Sum squared resid	645.6593	Schwarz criterion	5.002253
Log likelihood	-288.6400	Hannan-Quinn criter.	4.805827
F-statistic	2.795326	Durbin-Watson stat	0.839828
Prob(F-statistic)	0.001292		

Lagrangian Multiplier

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	16.32146 (0.0001)	0.026297 (0.8712)	16.34775 (0.0001)
Honda	4.039982 (0.0034)	-0.162163 --	2.742032 (0.0031)
King-Wu	4.039982 (0.0034)	-0.162163 --	2.522205 (0.0058)

Standardized Honda	4.460067 (0.0034)	0.032024 (0.4872)	-0.558744 --
Standardized King- Wu	4.460067 (0.0034)	0.032024 (0.4872)	-0.770400 --
Gourierioux, et al.*	--	--	16.32146 (< 0.01)

*Mixed chi-square asymptotic critical values:

1%	7.289
5%	4.321
10%	2.952

Use random effect since $P < 0.05$
 Random effect Model is Appropriate
 Model Two

Chow Test

Redundant Fixed Effects Tests

Equation: Untitled

Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	2.850988	(12,115)	0.0018
Cross-section Chi-square	33.856557	12	0.0007

Cross-section fixed effects test equation:

Dependent Variable: ROA

Method: Panel Least Squares

Date: 10/07/22 Time: 10:03

Sample: 2012 2021

Periods included: 10

Cross-sections included: 13

Total panel (balanced) observations: 130

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LLP	0.005397	0.002428	2.223203	0.0280
YR2-YR10	0.135817	0.573212	0.236939	0.8131
C	0.360343	0.228983	1.573670	0.1181
R-squared	0.038390	Mean dependent var		0.460509
Adjusted R-squared	0.023247	S.D. dependent var		2.590049
S.E. of regression	2.559767	Akaike info criterion		4.740516
Sum squared resid	832.1557	Schwarz criterion		4.806690
Log likelihood	-305.1335	Hannan-Quinn criter.		4.767405
F-statistic	2.535089	Durbin-Watson stat		0.911922
Prob(F-statistic)	0.083259			

Since P value is less than 0.05 FE/RE model is appropriate

Fixed Effect Model

Dependent Variable: ROA

Method: Panel Least Squares

Date: 01/21/23 Time: 16:21

Sample: 2012 2021

Periods included: 10

Cross-sections included: 13

Total panel (balanced) observations: 130

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LLP	-0.002954	0.002668	-1.097030	0.0054
YR2-YR10	-0.037855	0.536268	-0.044525	0.9646
C	0.514826	0.212959	2.417486	0.0172

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.258872	Mean dependent var	0.460509
Adjusted R-squared	0.168647	S.D. dependent var	2.590049
S.E. of regression	2.361569	Akaike info criterion	4.664696
Sum squared resid	641.3559	Schwarz criterion	4.995566
Log likelihood	-288.2053	Hannan-Quinn criter.	4.799140
F-statistic	2.869200	Durbin-Watson stat	1.729065
Prob(F-statistic)	0.000979		

Random Effect

Dependent Variable: ROA

Method: Panel EGLS (Cross-section random effects)

Date: 01/21/23 Time: 16:22

Sample: 2012 2021

Periods included: 10

Cross-sections included: 13

Total panel (balanced) observations: 130

Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LLP	0.005397	0.002240	2.409788	0.0174
YR2-YR10	0.135817	0.528830	0.256825	0.7977
C	0.360343	0.211253	1.705742	0.0905

Effects Specification

	S.D.	Rho
Cross-section random	0.003400	0.0034
Idiosyncratic random	2.361569	1.0000

Weighted Statistics

R-squared	0.038390	Mean dependent var	0.460509
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Adjusted R-squared	0.023247	S.D. dependent var	2.590049
S.E. of regression	2.559767	Sum squared resid	832.1557
F-statistic	2.535089	Durbin-Watson stat	0.911922
Prob(F-statistic)	0.083259		

Unweighted Statistics

R-squared	0.038390	Mean dependent var	0.460509
Sum squared resid	832.1557	Durbin-Watson stat	0.911922

Hausman Test

Correlated Random Effects - Hausman Test

Equation: Untitled

Test cross-section random effects

	Chi-Sq.		
Test Summary	Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	31.014476	2	0.0034

** WARNING: estimated cross-section random effects variance is zero.

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
LLP	-0.002954	0.005397	0.003402	0.0034
(YR2-YR10)	-0.037855	0.135817	0.007922	0.0728

Cross-section random effects test equation:

Dependent Variable: ROA

Method: Panel Least Squares

Date: 01/21/23 Time: 16:23

Sample: 2012 2021

Periods included: 10

Cross-sections included: 13

Total panel (balanced) observations: 130

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.514826	0.212959	2.417486	0.0172
LLP	-0.002954	0.002668	-1.097030	0.0054
YR2-YR10	-0.037855	0.536268	-0.044525	0.9646

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.258872	Mean dependent var	0.460509
Adjusted R-squared	0.168647	S.D. dependent var	2.590049

S.E. of regression	2.361569	Akaike info criterion	4.664696
Sum squared resid	641.3559	Schwarz criterion	4.995566
Log likelihood	-288.2053	Hannan-Quinn criter.	4.799140
F-statistic	2.869200	Durbin-Watson stat	1.729065
Prob(F-statistic)	0.000979		

Fixed effect Model is Appropriate

Model Three

Chow test

Redundant Fixed Effects Tests

Equation: Untitled

Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	0.358719	(12,115)	0.9749
Cross-section Chi-square	4.777244	12	0.9650

Cross-section fixed effects test equation:

Dependent Variable: ROA

Method: Panel Least Squares

Date: 10/07/22 Time: 10:05

Sample: 2012 2021

Periods included: 10

Cross-sections included: 13

Total panel (balanced) observations: 130

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RWA	0.067768	0.005824	11.63552	0.0034
YR2-YR10	0.158471	0.405909	0.390411	0.6969
C	0.016138	0.163720	0.098570	0.9216
R-squared	0.516447	Mean dependent var	0.460509	
Adjusted R-squared	0.508831	S.D. dependent var	2.590049	
S.E. of regression	1.815195	Akaike info criterion	4.053069	
Sum squared resid	418.4564	Schwarz criterion	4.119243	
Log likelihood	-260.4495	Hannan-Quinn criter.	4.079958	
F-statistic	67.81949	Durbin-Watson stat	1.674968	
Prob(F-statistic)	0.003400			

Since the p value is greater than 0.05 common effect is appropriate, Hence Lagragian multiplier test will be carried out

Lagragian 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	3.894133 (0.0485)	0.004100 (0.9489)	3.898232 (0.0483)
Honda	-1.973356 --	0.064028 (0.4745)	-1.350099 --
King-Wu	-1.973356 --	0.064028 (0.4745)	-1.243464 --
Standardized Honda	-1.797458 --	0.264922 (0.3955)	-5.006884 --
Standardized King-			
Wu	-1.797458 --	0.264922 (0.3955)	-4.855613 --

Gourierioux, et al.* -- -- 0.004100
 (>= 0.10)

*Mixed chi-square asymptotic critical values:

1%	7.289
5%	4.321
10%	2.952

Use RE since p value is less than 0.05

Fixed Effect Model

Dependent Variable: ROA

Method: Panel Least Squares

Date: 01/21/23 Time: 16:27

Sample: 2012 2021

Periods included: 10

Cross-sections included: 13

Total panel (balanced) observations: 130

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RWA	0.077624	0.009293	8.352743	0.0034
YR2-YR10	0.235048	0.426432	0.551195	0.5826

C -0.048490 0.175197 -0.276773 0.7825

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.533894	Mean dependent var	0.460509
Adjusted R-squared	0.477150	S.D. dependent var	2.590049
S.E. of regression	1.872822	Akaike info criterion	4.200936
Sum squared resid	403.3580	Schwarz criterion	4.531806
Log likelihood	-258.0609	Hannan-Quinn criter.	4.335380
F-statistic	9.408913	Durbin-Watson stat	1.892168
Prob(F-statistic)	0.003400		

Random Effect Model

Dependent Variable: ROA

Method: Panel EGLS (Cross-section random effects)

Date: 01/21/23 Time: 16:28

Sample: 2012 2021

Periods included: 10

Cross-sections included: 13

Total panel (balanced) observations: 130

Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RWA	0.067768	0.006009	11.27749	0.0034
YR2-YR10	0.158471	0.418795	0.378398	0.7058
C	0.016138	0.168917	0.095537	0.9240

Effects Specification

	S.D.	Rho
Cross-section random	0.003400	0.0034
Idiosyncratic random	1.872822	1.0000

Weighted Statistics

R-squared	0.516447	Mean dependent var	0.460509
Adjusted R-squared	0.508831	S.D. dependent var	2.590049
S.E. of regression	1.815195	Sum squared resid	418.4564
F-statistic	67.81949	Durbin-Watson stat	1.674968
Prob(F-statistic)	0.003400		

Unweighted Statistics

R-squared	0.516447	Mean dependent var	0.460509
Sum squared resid	418.4564	Durbin-Watson stat	1.674968

Hauseman Test

Correlated Random Effects - Hausman Test

Equation: Untitled

Test cross-section random effects

	Chi-Sq.		
Test Summary	Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	1.970526	2	0.3733

** WARNING: estimated cross-section random effects variance is zero.

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
RWA	0.077624	0.067768	0.003450	0.1644
(YR2-YR10)	0.235048	0.158471	0.006455	0.3405

Cross-section random effects test equation:

Dependent Variable: ROA

Method: Panel Least Squares

Date: 01/21/23 Time: 16:29

Sample: 2012 2021

Periods included: 10

Cross-sections included: 13

Total panel (balanced) observations: 130

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.048490	0.175197	-0.276773	0.7825
RWA	0.077624	0.009293	8.352743	0.0034
YR2-YR10	0.235048	0.426432	0.551195	0.5826

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.533894	Mean dependent var	0.460509
Adjusted R-squared	0.477150	S.D. dependent var	2.590049
S.E. of regression	1.872822	Akaike info criterion	4.200936
Sum squared resid	403.3580	Schwarz criterion	4.531806
Log likelihood	-258.0609	Hannan-Quinn criter.	4.335380
F-statistic	9.408913	Durbin-Watson stat	1.892168
Prob(F-statistic)	0.003400		

Random effect is appropriate

Model Four

Chow Test

Redundant Fixed Effects Tests

Equation: Untitled

Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	3.187961	(12,115)	0.0006
Cross-section Chi-square	37.332691	12	0.0073

Cross-section fixed effects test equation:

Dependent Variable: ROA

Method: Panel Least Squares

Date: 10/07/22 Time: 10:10

Sample: 2012 2021

Periods included: 10

Cross-sections included: 13

Total panel (balanced) observations: 130

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LQR	-0.000926	0.002560	-0.361901	0.7180
YR2-YR10	0.183750	0.585903	0.313619	0.7543
C	0.477320	0.233385	2.045203	0.0429

R-squared	0.001995	Mean dependent var	0.460509
Adjusted R-squared	-0.013722	S.D. dependent var	2.590049

S.E. of regression	2.607758	Akaike info criterion	4.777665
Sum squared resid	863.6512	Schwarz criterion	4.843839
Log likelihood	-307.5483	Hannan-Quinn criter.	4.804554
F-statistic	0.126934	Durbin-Watson stat	0.632815
Prob(F-statistic)	0.880904		

Since the P value is less than 0.05, FE/RE is appropriate

Fixed Effect Model

Dependent Variable: ROA

Method: Panel Least Squares

Date: 01/21/23 Time: 16:31

Sample: 2012 2021

Periods included: 10

Cross-sections included: 13

Total panel (balanced) observations: 130

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LQR	-2.82E-05	0.003105	-0.009095	0.9928
YR2-YR10	-0.035946	0.543671	-0.066118	0.9474
C	0.461021	0.215694	2.137389	0.0347

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.251116	Mean dependent var	0.460509
Adjusted R-squared	0.159948	S.D. dependent var	2.590049
S.E. of regression	2.373893	Akaike info criterion	4.675106
Sum squared resid	648.0672	Schwarz criterion	5.005976
Log likelihood	-288.8819	Hannan-Quinn criter.	4.809550
F-statistic	2.754420	Durbin-Watson stat	0.842126
Prob(F-statistic)	0.001506		

Random Effect Model

Dependent Variable: ROA

Method: Panel EGLS (Cross-section random effects)

Date: 01/21/23 Time: 16:32

Sample: 2012 2021

Periods included: 10

Cross-sections included: 13

Total panel (balanced) observations: 130

Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LQR	-0.000435	0.002781	-0.156334	0.0060
YR2-YR10	0.032773	0.540052	0.060685	0.9517

C	0.468397	0.372299	1.258120	0.2107
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Effects Specification

	S.D.	Rho
Cross-section random	1.097840	0.1762
Idiosyncratic random	2.373893	0.8238

Weighted Statistics

R-squared	0.446242	Mean dependent var	0.259933
Adjusted R-squared	0.335502	S.D. dependent var	2.358095
S.E. of regression	2.376303	Sum squared resid	717.1457
F-statistic	0.015354	Durbin-Watson stat	1.760755
Prob(F-statistic)	0.984765		

Unweighted Statistics

R-squared	0.071099	Mean dependent var	0.460509
Sum squared resid	864.4267	Durbin-Watson stat	1.631138

Hausman Test

Correlated Random Effects - Hausman Test

Equation: Untitled

Test cross-section random effects

		Chi-Sq.		
Test Summary	Statistic	Chi-Sq.	d.f.	Prob.
Cross-section random	2.258030		2	0.3234

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
LQR	-0.003428	-0.000435	0.003402	0.7687
(YR2-YR10)	-0.035946	0.032773	0.003922	0.2725

Cross-section random effects test equation:

Dependent Variable: ROA

Method: Panel Least Squares

Date: 01/21/23 Time: 16:32

Sample: 2012 2021

Periods included: 10

Cross-sections included: 13

Total panel (balanced) observations: 130

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.461021	0.215694	2.137389	0.0347
LQR	-2.82E-05	0.003105	-0.009095	0.9928

YR2-YR10 -0.035946 0.543671 -0.066118 0.9474

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.251116	Mean dependent var	0.460509
Adjusted R-squared	0.159948	S.D. dependent var	2.590049
S.E. of regression	2.373893	Akaike info criterion	4.675106
Sum squared resid	648.0672	Schwarz criterion	5.005976
Log likelihood	-288.8819	Hannan-Quinn criter.	4.809550
F-statistic	2.754420	Durbin-Watson stat	0.842126
Prob(F-statistic)	0.001506		

Random Effect Model is appropriate

Lagragian

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
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Breusch-Pagan	15.77164	0.099649	15.87129
	(0.0001)	(0.7523)	(0.0001)
Honda	3.971352	-0.315672	2.584957
	(0.0034)	--	(0.0054)
King-Wu	3.971352	-0.315672	2.361235
	(0.0034)	--	(0.0091)
Standardized Honda	4.445785	-0.126646	-0.711061
	(0.0034)	--	--
Standardized King-			
Wu	4.445785	-0.126646	-0.928462
	(0.0034)	--	--
Gourierioux, et al.*	--	--	15.77164
			(< 0.01)

*Mixed chi-square asymptotic critical values:

1%	7.289
5%	4.321
10%	2.952

Random Effect model is appropriate since p value is less than 0.05

Model Five

Chow Test

Redundant Fixed Effects Tests

Equation: Untitled

Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	0.370374	(12,111)	0.9713
Cross-section Chi-square	5.103749	12	0.9544

Cross-section fixed effects test equation:

Dependent Variable: ROA

Method: Panel Least Squares

Date: 10/07/22 Time: 10:12

Sample: 2012 2021

Periods included: 10

Cross-sections included: 13

Total panel (balanced) observations: 130

Variable	Coefficient	Std. Error	t-Statistic	Prob.
NPL	0.014530	0.022964	0.632719	0.5281
LLP	-0.014008	0.001982	-7.066255	0.0034
RWA	0.098754	0.006717	14.70214	0.0034

LQR	7.39E-05	0.001554	0.047584	0.9621
BS	-0.071342	0.104756	-0.681029	0.4971
YR2-YR10	0.349633	0.357414	0.978230	0.3299
C	0.464781	0.798678	0.581938	0.5617
<hr/>				
R-squared	0.657105	Mean dependent var	0.460509	
Adjusted R-squared	0.640379	S.D. dependent var	2.590049	
S.E. of regression	1.553212	Akaike info criterion	3.770869	
Sum squared resid	296.7334	Schwarz criterion	3.925275	
Log likelihood	-238.1065	Hannan-Quinn criter.	3.833609	
F-statistic	39.28511	Durbin-Watson stat	1.427329	
Prob(F-statistic)	0.003400			

The common effect is appropriate since p value is greater than 0.05

Lagrangian Multiplier (LM) Test For Random Effects Using Breusch-Pagan

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	3.578691 (0.0585)	0.001893 (0.9653)	3.580584 (0.0585)
Honda	-1.891743 --	0.043504 (0.4827)	-1.306903 --
King-Wu	-1.891743 --	0.043504 (0.4827)	-1.205551 --
Standardized Honda	-1.541385 --	0.222430 (0.4120)	-4.886784 --
Standardized King- Wu	-1.541385 --	0.222430 (0.4120)	-4.728074 --
Gourierioux, et al.*	--	--	0.001893 (≥ 0.10)

*Mixed chi-square asymptotic critical values:

1%	7.289
5%	4.321
10%	2.952

Use common effect

Dependent Variable: ROA

Method: Panel Least Squares

Date: 10/07/22 Time: 17:01

Sample: 2012 2021

Periods included: 10

Cross-sections included: 13

Total panel (balanced) observations: 130

Variable	Coefficient	Std. Error	t-Statistic	Prob.
NPL	0.006575	0.022476	0.442200	0.6602
LLP	-0.028559	0.001974	-7.007643	0.0034
RWA	0.098662	0.006699	14.67225	0.0034
LQR	0.000119	0.001541	-0.077268	0.0385
BS	-0.081176	0.104255	-0.778630	0.4377
C	0.565250	0.791910	0.713781	0.4767
R-squared	0.654438	Mean dependent var	0.460509	
Adjusted R-squared	0.640504	S.D. dependent var	2.590049	
S.E. of regression	1.552942	Akaike info criterion	3.763234	
Sum squared resid	299.0420	Schwarz criterion	3.895582	
Log likelihood	-238.6102	Hannan-Quinn criter.	3.817012	

F-statistic 46.96706 Durbin-Watson stat 1.852094
 Prob(F-statistic) 0.003400

Heteroscedasticity Test

NPL and ROA

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic 2.697584 Prob. F(1,128) 0.1030
 Obs*R-squared 2.683186 Prob. Chi-Square(1) 0.1014
 Scaled explained SS 32.58758 Prob. Chi-Square(1) 0.0034

Test Equation:

Dependent Variable: RESID^2

Method: Least Squares

Date: 10/07/22 Time: 13:51

Sample: 1 130

Included observations: 130

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	11.45951	4.130477	2.774380	0.0064
NPL	-0.739130	0.450021	-1.642432	0.1030

R-squared 0.020640 Mean dependent var 6.641809

Adjusted R-squared	0.012989	S.D. dependent var	33.37431
S.E. of regression	33.15686	Akaike info criterion	9.855641
Sum squared resid	140720.3	Schwarz criterion	9.899757
Log likelihood	-638.6167	Hannan-Quinn criter.	9.873567
F-statistic	2.697584	Durbin-Watson stat	1.086093
Prob(F-statistic)	0.102955		

LLP and ROA

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.046589	Prob. F(1,128)	0.8295
Obs*R-squared	0.047300	Prob. Chi-Square(1)	0.8278
Scaled explained SS	1.285529	Prob. Chi-Square(1)	0.2569

Test Equation:

Dependent Variable: WGT_RESID^2

Method: Least Squares

Date: 10/07/22 Time: 14:16

Sample: 1 130

Included observations: 130

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	199.4798	134.7480	1.480392	0.1412

LLP*WGT	0.006320	0.029282	0.215845	0.8295
R-squared	0.000364	Mean dependent var	202.5180	
Adjusted R-squared	-0.007446	S.D. dependent var	1522.301	
S.E. of regression	1527.958	Akaike info criterion	17.51652	
Sum squared resid	2.99E+08	Schwarz criterion	17.56063	
Log likelihood	-1136.574	Hannan-Quinn criter.	17.53444	
F-statistic	0.046589	Durbin-Watson stat	2.052181	
Prob(F-statistic)	0.829452			

RWA and ROA

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.527532	Prob. F(1,128)	0.4690
Obs*R-squared	0.533576	Prob. Chi-Square(1)	0.4651
Scaled explained SS	9.891256	Prob. Chi-Square(1)	0.0017

Test Equation:

Dependent Variable: WGT_RESID^2

Method: Least Squares

Date: 10/07/22 Time: 14:37

Sample: 1 130

Included observations: 130

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.617285	1.327847	1.971075	0.0509
RWA*WGT	-1.973402	2.717008	-0.726314	0.4690
R-squared	0.004104	Mean dependent var	2.236433	
Adjusted R-squared	-0.003676	S.D. dependent var	13.88381	
S.E. of regression	13.90930	Akaike info criterion	8.118258	
Sum squared resid	24764.00	Schwarz criterion	8.162374	
Log likelihood	-525.6868	Hannan-Quinn criter.	8.136184	
F-statistic	0.527532	Durbin-Watson stat	1.005939	
Prob(F-statistic)	0.468972			

LIQ and ROA

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.677223	Prob. F(1,128)	0.4121
Obs*R-squared	0.684184	Prob. Chi-Square(1)	0.4081
Scaled explained SS	11.00228	Prob. Chi-Square(1)	0.0009

Test Equation:

Dependent Variable: WGT_RESID^2

Method: Least Squares

Date: 10/07/22 Time: 14:40

Sample: 1 130

Included observations: 130

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	385.3813	180.5578	2.134392	0.0347
LQR*WGT	-136.3817	165.7259	-0.822935	0.4121
R-squared	0.005263	Mean dependent var	326.8545	
Adjusted R-squared	-0.002508	S.D. dependent var	1889.881	
S.E. of regression	1892.250	Akaike info criterion	17.94419	
Sum squared resid	4.58E+08	Schwarz criterion	17.98830	
Log likelihood	-1164.372	Hannan-Quinn criter.	17.96211	
F-statistic	0.677223	Durbin-Watson stat	1.518213	
Prob(F-statistic)	0.412075			

BS and other Moderating Variables and ROA

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.517604	Prob. F(1,128)	0.2202
Obs*R-squared	1.523257	Prob. Chi-Square(1)	0.2171
Scaled explained SS	18.86302	Prob. Chi-Square(1)	0.0034

Test Equation:

Dependent Variable: WGT_RESID^2

Method: Least Squares

Date: 10/07/22 Time: 14:41

Sample: 1 130

Included observations: 130

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	47.27698	32.66465	1.447344	0.1502
BS*WGT	-5.967321	4.843955	-1.231911	0.2202

R-squared	0.011717	Mean dependent var	7.232056
Adjusted R-squared	0.003996	S.D. dependent var	36.69493
S.E. of regression	36.62153	Akaike info criterion	10.05441
Sum squared resid	171665.5	Schwarz criterion	10.09853
Log likelihood	-651.5370	Hannan-Quinn criter.	10.07234
F-statistic	1.517604	Durbin-Watson stat	1.190945
Prob(F-statistic)	0.220241		

SerialCorrelation

NPL and ROA

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.821282	Prob. F(2,124)	0.4422
Obs*R-squared	1.686457	Prob. Chi-Square(2)	0.4303

Test Equation:

Dependent Variable: RESID

Method: Least Squares

Date: 10/07/22 Time: 16:26

Sample: 2 130

Included observations: 129

Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
NPL	0.001563	0.029075	0.053756	0.9572
ROA(-1)	0.222283	0.210714	1.054905	0.2935
C	-0.112673	0.289711	-0.388914	0.6980
RESID(-1)	-0.224447	0.228818	-0.980896	0.3286
RESID(-2)	-0.194901	0.152138	-1.281079	0.2026

R-squared	0.013073	Mean dependent var	9.61E-17
Adjusted R-squared	-0.018763	S.D. dependent var	2.106115
S.E. of regression	2.125782	Akaike info criterion	4.384145
Sum squared resid	560.3496	Schwarz criterion	4.494990

Log likelihood	-277.7773	Hannan-Quinn criter.	4.429184
F-statistic	0.410641	Durbin-Watson stat	1.968918
Prob(F-statistic)	0.800705		

LLP and ROA

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	2.749983	Prob. F(2,124)	0.0678
Obs*R-squared	5.478733	Prob. Chi-Square(2)	0.0646

Test Equation:

Dependent Variable: RESID

Method: Least Squares

Date: 10/07/22 Time: 16:27

Sample: 2 130

Included observations: 129

Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LLP	0.000316	0.002105	0.150275	0.8808
ROA(-1)	0.417334	0.202817	2.057684	0.0417
C	-0.198053	0.208400	-0.950350	0.3438

RESID(-1)	-0.456137	0.223278	-2.042909	0.0432
RESID(-2)	-0.336301	0.147494	-2.280095	0.0243
<hr/>				
R-squared	0.042471	Mean dependent var	1.38E-16	
Adjusted R-squared	0.011583	S.D. dependent var	2.103712	
S.E. of regression	2.091493	Akaike info criterion	4.351622	
Sum squared resid	542.4186	Schwarz criterion	4.462467	
Log likelihood	-275.6796	Hannan-Quinn criter.	4.396661	
F-statistic	1.374992	Durbin-Watson stat	1.995966	
Prob(F-statistic)	0.246441			
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RWA and ROA

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.576216	Prob. F(2,126)	0.2108
Obs*R-squared	3.173121	Prob. Chi-Square(2)	0.2046
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Test Equation:

Dependent Variable: RESID

Method: Least Squares

Date: 10/07/22 Time: 16:28

Sample: 1 130

Included observations: 130

Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RWA	0.003382	0.006100	0.554465	0.5802
C	-0.021761	0.162929	-0.133564	0.8940
RESID(-1)	-0.039876	0.088097	-0.452634	0.6516
RESID(-2)	0.157792	0.092954	1.697534	0.0921
R-squared	0.024409	Mean dependent var	-3.12E-17	
Adjusted R-squared	0.001180	S.D. dependent var	1.802149	
S.E. of regression	1.801085	Akaike info criterion	4.044942	
Sum squared resid	408.7324	Schwarz criterion	4.133173	
Log likelihood	-258.9212	Hannan-Quinn criter.	4.080793	
F-statistic	1.050811	Durbin-Watson stat	1.997115	
Prob(F-statistic)	0.372614			

LQR and ROA

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.816520	Prob. F(2,124)	0.4443
Obs*R-squared	1.676805	Prob. Chi-Square(2)	0.4324

Test Equation:

Dependent Variable: RESID

Method: Least Squares

Date: 10/07/22 Time: 16:29

Sample: 2 130

Included observations: 129

Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LQR	0.000168	0.002084	0.080693	0.9358
ROA(-1)	0.220423	0.210129	1.048990	0.2962
C	-0.104596	0.215540	-0.485272	0.6283
RESID(-1)	-0.222334	0.228443	-0.973260	0.3323
RESID(-2)	-0.194160	0.151981	-1.277527	0.2038
R-squared	0.012998	Mean dependent var		1.58E-16
Adjusted R-squared	-0.018840	S.D. dependent var		2.105765
S.E. of regression	2.125509	Akaike info criterion		4.383888
Sum squared resid	560.2059	Schwarz criterion		4.494734
Log likelihood	-277.7608	Hannan-Quinn criter.		4.428927
F-statistic	0.408260	Durbin-Watson stat		1.970491
Prob(F-statistic)	0.802417			

BS and ROA

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.828866	Prob. F(2,124)	0.4389
Obs*R-squared	1.701826	Prob. Chi-Square(2)	0.4270

Test Equation:

Dependent Variable: RESID

Method: Least Squares

Date: 10/07/22 Time: 16:30

Sample: 2 130

Included observations: 129

Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
BS	0.011708	0.136483	0.085782	0.9318
ROA(-1)	0.221418	0.209336	1.057719	0.2922
C	-0.181493	0.963931	-0.188284	0.8510
RESID(-1)	-0.223153	0.227235	-0.982036	0.3280
RESID(-2)	-0.194962	0.151487	-1.286990	0.2005

R-squared	0.013192	Mean dependent var	-5.42E-17
Adjusted R-squared	-0.018640	S.D. dependent var	2.104421
S.E. of regression	2.123944	Akaike info criterion	4.382415

Sum squared resid	559.3810	Schwarz criterion	4.493260
Log likelihood	-277.6658	Hannan-Quinn criter.	4.427454
F-statistic	0.414433	Durbin-Watson stat	1.972234
Prob(F-statistic)	0.797977		

AppendixII

LIST OF QUOTED BANKS	
Internationally Licensed Banks	Nationally Licensed Banks
First Bank Plc.	Wema Plc.
Guaranty Trust Bank Plc.	Unity Bank Plc.
Zenith Bank Plc.	Sterling Bank Plc.
Access Bank Plc.	Stanbic IBTC, Plc.
Fidelity Bank Plc.	Eco Bank Plc.
Union Bank Plc.	
First City Monument Bank Plc.	
United Bank for Africa Plc.	

Bio-data

A. Personal Data

Full Name: LukmanAyodejiOsho
Address: 98, Akarigbo Street, Sagamu, Ogun State
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Phone No: 08032244559
Date of Birth: 15th October, 1977
Place of Birth: Sagamu
Nationality: Nigeria
Next of Kin: BimbolaOsho
Address 98, Akarigbo Street, Sagamu, Ogun State

B. Educational Background

Education Institutions Attended with Dates and Qualification

- PhD in Finance - Lead City University, Ibadan (in view)
- Msc. in Finance - Babcock University, Ilishan Remo 2020
- Bsc. in Accounting - Imo State University, Owerri 2010
- Msc. in Banking & Finance - OlabisiOnabanjo University, Ago- Iwoye 2008
- HND in Insurance - Lagos State Polytechnic, Isolo 2003
- ND in Financial Studies - The Polytechnic, Ibadan 2000
- S.S.C.E - Muslim High School, Sabo, Sagamu 1994

C. Working Experience with Dates

Safad Insurance Brokers, Oke Ado, Ibadan	Industrial Training	2000-2001
Ngaski Local Government, Warra, Kebbi State	NYSC	2003-2004
MoshoodAbiola Polytechnic, Abeokuta	Part time Lecturer	2005- Till date
MoshoodAbiola Polytechnic, Abeokuta	Lecturer	2008 - Till date

D. Membership of Academic and Professional Bodies

- i. Associate, Institute of Chartered Accountant of Nigeria (ICAN)
- ii. Graduate Member, Chartered Institute of Stockbrokers of Nigeria (CIS)
- iii. Associate, Institute of Strategic Management of Nigeria
- iv. Associate, Chartered Insurance Institute of Nigeria (CIIN)

E. Publications

International Journals

- i. Oguntodu, J.A., Osho, L.A. and Ogbebor, P.I. (2020). Capital Adequacy and Return on Capital Employed of Quoted Deposit Money Banks in Nigeria. *International Journal of Advanced Research in Accounting, Economics and Business Perspectives (IJARAEBP)*. Vol.4. No.1, 84-99
- ii. Ogbebor, P.I., Osho, L.A. and Oguntodu, J.A. (2020). Capital Adequacy and Return on Equity of Deposit Money Banks Quoted in Nigeria. *International Journal of Management Sciences and Business Research..* Vol.9. No.2, 111-120
- iii. Osho, L.A. and Adejonwo, A. Q. (2018). Microfinance Loan: A Sustainable tool for Agricultural Development in Nigeria. *International Journal of Advanced Scientific*

Research in Social Sciece and Management Studies (IJASRSSMS). Vol.3.No.2, 92-106

- iv. Osho,L.A. and Ademuyiwa, M.A. (2017). Insurance and Entrepreneurship Development: Focus on Nigeria. *International Journal of Entrepreneurship Development, Education & Science Research. . Vol.4.No.1 46-57*

National Journals

- i. Osho, L.A., Adebowale, E.A. and Adebola, F.T. (2022). Deposit Money banks Financial Intermediation and Financial Development of Nigeria Economy. *Journal of Contemporary Issues on Innovations Academic Staff Union of Polytechnic, Ogun State Institute of Technology, Igbesa Chapter Vol..No.1, 73-95.*
- ii. Osho, L.A., Salami, G.O. and Adesile, H.O. (2022). Corporate Social Responsibility and Profitability of Deposit Money banks in Nigeria. *SapaadeJournal of Management Science and Technology, Vo3..No.1, 322-330.*
- iii. Adebowale, E.A., Osho, L.A. and Ademuyiwa, M.A. (2021). Foreign Portfolio Investment and Manufacturing Sector Performance: Evidence from Nigerian Stock Exchange. *Journal of Management and Tecnology (JORMATECH)Vol.6.No.2, 75-83.*
- iv. Osho,L.A., Adejonwo, A. Q. and Adesile, H.O. (2020). Agricultural Financing and Economic Growth in Nigeria *Journal of Academic Staff Union of Polytechnic(JASUP) The Fedral Polytechnic, NasarawaChapter.JASUP/ 20/ 001.*
- v. Ogbebor, P.I., Oguntodu, J.A. and Osho, L.A. (2019). Capital Adequacy and Return on Assets of Deposit Money Banks Quoted in Nigeria. *Babcock Journal of Economics, banking and Finance. Vol.6, 134-148*

- vi. Adebola, F.T. and Osho, L.A. (2018). The Determinants of Real Exchange Rate in Nigeria (2007-2016). *A Multi-disciplinary Publication of Academic Staff Union of Polytechnic, Zone C. Vol.3.No.1*, 83-88
- vii. Osho,L.A. and Usifoh O.O. (2015). Effective Funding of Small Scale Industries: A key for Nigeria's Economic Development. *ASPMAP Journal of Multidiscipline Constructs. Vol.1.No.1*, 37-55

F. Conference Papers Presented

- i. **Osho, L.A. & Ogunwede, J.K. (2022) Impact of Rural Microfinance on Poverty Alleviation in Ogun State.** Being a paper presented for 2022 6th National Conference of ASUP Zone C, Federal Polytechnic, Ilaro Chapter
- ii. **Osho, L.A. & Salami, G. O. (2022) Cashless policy and Nigeria Economic Growth.** Being a paper presented for 2022 3rd Annual International Conference of ASUP Osun State Polytechnic, Iree Chapter
- iii. **Osho, L.A. & Felix, Taiwo (2021) Corporate Governance and Financial Performance of Deposit Money Banks in Nigeria.** Being a paper presented for 2021 4th National Conference of Faculty of Financial Studies, Osun State Polytechnic, Iree
- iv. **Osho, L.A. & Ogunwede, J.K. (2021) Insurance and Economic Development in Nigeria.** Being a paper presented for 2021 12th National and first Virtual Conference of School of Management Science, Federal Polytechnic, Ilaro
- v. **Osho, L.A. (2020) Cashless Transactions and Sustainability of Deposit Money Banks in Nigeria in a Post Pandemic Economy.** Being a paper presented for 2020 4th National Conference of ASUP Zone C, Federal Polytechnic, Ilaro Chapter

- vi. **Osho, L.A. & Salami, G.O. (2020) Effect of Firm Characteristics on Working Capital Management of Firms in Nigeria..** Being a paper presented for 2020 International Conference of ASUP, YabaTech. Chapter
- vii. **Osho, L.A. (2018) Financing Entrepreneurship and sustainable Development in Nigeria: A case of Ogun State.** Being a paper presented for 2018 5th National Conference of School of Business and Management Studies, The Federal Polytechnic, Offa
- viii. **Osho, L.A. & Adebola, O.A. (2018) Micro Finance Loans and Small and Medium Scale Business in Nigeria.** Being a paper presented for 2018 1stInternational Conference and Exhibition on Technological Innovation and Global Competitiveness. The Federal Polytechnic, Ilaro
- ix. **Osho, L.A. & Salami, G.O. (2017) Audit Firm Characteristics and Performance of Quoted Firms in Nigeria.** Being a paper presented for 2017 International Conference of Institute of Business and Office Administrators of Nigeria and The Ibarapa Polytechnic Eruwa, Oyo State
- x. **Osho, L.A. & Adesile, H.O. (2017) Insurance and Infrastructural Development in Nigeria Economy.** Being a paper presented for 2017 3rd National Conference of Engineering and Exhibition of School of Engineering, MoshoodAbiola Polytechnic, Abeokuta
- xi. **Osho, L.A. & Usifoh, O.O. (2016) Micro Finance and Entrepreneurship: A concept to improve standard of living of people in Nigeria.** Being a paper presented for 2016 International Conference of School of Business and Management Studies, MoshoodAbiola Polytechnic, Abeokuta

- xii. **Osho, L.A. & Adesile, H.O. (2016) Insurance and Entrepreneurship:** Focus on Nigeria. Being a paper presented for 2016 International Conference of School of Business and Management Studies, MoshoodAbiola Polytechnic, Abeokuta
- xiii. **Osho, L.A. & Usifoh, O.O. (2016) Impact of Electronic Banking System on Consumer Service Delivery in Nigeria:** Being a paper presented at 2nd Femi Sonaike 2016 International Conference of School of Communication and General Studies, MoshoodAbiola Polytechnic, Abeokuta.

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The University Compliance Certificate

This is to certify that this thesis was written by Lukman Ayodeji OSHO with Matric number LCU/PG/001904 in the Department of Management and Accounting, Faculty of Management and Social Sciences, Lead City University, Ibadan is in full compliance with the approved university format and style.

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Signature

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Date

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