



DETERMINANTS OF PROFITABILITY OF LISTED DEPOSIT MONEY BANKS IN NIGERIA

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Abstract

This study examines the determinants of profitability of listed deposit money banks in Nigeria for fifteen years (15) from 2007 to 2021. The population of the study consists of fourteen (14) deposit money banks listed in Nigerian Exchange Group. In arriving at the sample size of twelve (12) banks, the filtering criteria was employed. Data were sourced secondarily from the audited annual reports of deposit money banks to extract data for non-performing loan, total assets, core tier 1 capital, leverage ratio, loan ratio, and operating income to expenses ratio. The study utilized descriptive analysis and multiple linear regression to analysed data and then test the significance of independent variables on the dependent variable, and determine their correlation. The findings from the study revealed that, asset quality, capital adequacy, liquidity management and management efficiency have significant effect on profitability of listed deposit money banks in Nigeria while leverage and bank size has no significant effect on profitability of deposit money banks in Nigeria. The study concluded that Assets quality, capital adequacy, liquidity, and management efficiency are the main determinants of profitability of listed deposit money banks in Nigeria, while bank size and leverage are not significant determinants of profitability of listed deposit money banks in Nigeria. The study recommended that banks should monitor carefully and control their loans to ensure asset quality and consequently increase their profitability because this can translate to profitability of listed deposit money banks in Nigeria. Nevertheless, there is the need for deposit money banks to increase their capital base in order to increase profitability.

Keywords: deposit money banks, determinants, profitability

1. Introduction

Banks' profitability allows them to survive negative shocks and strengthen their business environment, thus, providing sufficient incomes to their shareholders. According to Yonas (2022), profitability is considered the center around which all the activities of business take place. Profitability has become an important performance component as it provides information needed by internal and external stakeholders of banks for informed decision making. Profitability is seen as a metric of how effective and efficient a bank is using available resources to generate return within a defined period.

Schmidt (2014) opined that profitability plays a vital role in the survival of a firms such as banks that operates in competitive and homogenous. Usually, the profitability of banks is assessed through the return on assets and investments which explain the efficient use of these resources. The objectives of any firm such as a bank is to ensure profit and wealth maximization. Therefore, the ultimate goal of any business entity is to earn profit in order to make sure the sustainability of the business in the prevailing market conditions (Devi, 2014).



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The profitability of a financial institution is determined by factors which are internal or bank specific and external or macro-economic. The bank specific factors include asset quality, bank size, capital adequacy, leverage, liquidity and management efficiency while external factors include economic growth, inflation, interest rates, gross domestic product, and foreign exchange rate. These determinants of profitability have become useful tools for bank management to understand what needs to be done and where they should focus in order to improve on the profitability of their business (Bashar & Islam, 2014).

The various Basel Accords issued over time since its inception in 1988 have provided regulations on the capital adequacy of banks in order to absorb various financial shocks that may lead to financial losses and consequently reduce profitability (Banks for International Settlement, 1992). Capital adequacy is referred to as equity and subordinated funds held as reserves against risky assets in the event of decreasing profitability and insolvency. According to Christian et al. (2008), the adequacy of capital measurement provides banks with significant information about a bank's return. Therefore, the sustenance of a bank depends on capital adequacy level in order to continually drive operations and sustain quality risky assets.

The quality of assets held by banks depend on the exposure to specific risks, trends in non-performing loan, and level of loan loss provisions or reserves. Banks with high non-performing loans and loan loss provision reveal evidence of poor asset quality and these have adverse effect on profitability. Conversely, a low level of non-performing loan and loan loss provision is an evidence of good asset quality that have positive effect on profitability. Therefore, maintaining the quality of risky asset is a reflection of efficient management.

The essence of sustaining management efficiency always requires the ability of a bank to keep expense at a minimum level while determined to increase the level of income. Management efficiency is seen as the optimum utilization of resources in order to maximise profit for a bank. Ordinarily, the size of a bank can pose a challenge to management in ensuring efficiency especially where bank branches are on the increase with corresponding increase in cost. Though, this could portend increase in income. However, where these bank branches become unprofitable, it poses some danger to management efficiency level.

The economies of scale surrounding a firm is an indication that size is a crucial component in determining profitability (Niresh & Velnampy, 2014). The capacity to increase entry barriers for potential competitors and to take use of economies of scale to achieve increased profitability are two benefits associated with growing a firm's size (Ramasamy et al., 2005).

Financial management plays a crucial role in a bank's performance, as it determines the optimal capital structure that maximizes shareholders' earnings and increases the firm's value (Abubakar, 2015). Corporate financial managers are faced with the decision to choose the most appropriate capital mix of debt and equity in order to strengthen the capital structure. Firms with more reliance on debt over equity create a financial leverage for their operations. Financial leverage involves using debt to acquire additional assets and improve returns on owner investments. Long-term funding of an entity with an appropriate mix of debt and equity remains essential for financial planning, lowering average capital costs, and increasing profitability (Nwanna & Ivie, 2017).



The aftermath of the global financial crisis of 2008 constraint banks to write-off non-performing loans which consequently affected profitability negatively. Also, the COVID-19 pandemic slowed down the progressive rate of banks profitability. However, the banks experienced some profound changes in terms of technology in order to drive profitability. Therefore, the study of determinants of profitability has become increasingly significant to academic researches and this brings to the fore the quest to examine the internal determinants.

Statement of the Problem

The banking industry remains crucial in the financial system of any economy (San & Heng, 2013). The intermediary role of banks in any economy remains pertinent to the growth of the financial system and these banks must remain profitable in order to drive the economy. According to Aremu and Mejabi (2013), efficiency and profitability of banks have been of interest not just at the individual bank level, but also at a broader macroeconomic level.

The effect of the global financial crisis on Nigerian banks exposed the grave danger the banks were in terms of inadequate capital, low level of liquidity which consequently affected their profitability. The Central Bank of Nigeria (CBN) took measures to ensure the profitability of banks in Nigeria, such as injecting N620 billion into nine banks; replacing the chief executive/executive directors of eight of the nine banks with competent managers; reaffirming the guarantee of the local interbank market; and guaranteeing foreign creditors and correspondent banks' credit lines in order to restore confidence and maintain important correspondent banking relationships (Sanusi, 2010). Nevertheless, banks experienced merger and change in corporate identity. For instance, the merger of Access Bank Plc and Diamond Bank Plc on December, 19, 2018 (CBN Annual report, 2018).

Several studies have been carried out on the determinants of profitability. Some of these studies include Kadioglu et al. (2017); Niresh and Velnampy (2014); Ramasamy (2005); Adelina (2015); Birhanu (2018); Mecharia (2016); Alkhatib (2012); Bunyaminu et al. (2021); Idowu et al. (2017); and Al-Homaidi et al. (2018). These studies provided mixed findings that trigger further investigations on the study topic that aim at adding to existing knowledge. In addition, these studies have used several variables to represent profitability and these variables accounted for the different results that characterized their findings. Nevertheless, this study extended the scope of evaluation to 2021 in order to capture the aftermath of COVID-19. In view of the gaps mentioned, the study sought to address these gaps on the determinants of profitability of listed deposit money banks in Nigeria.

Objective of the Study

The main objective of the study is to examine determinants of profitability of listed deposit money banks in Nigeria. Other specific objectives are to examine the effect of asset quality, bank size, capital adequacy, financial leverage, liquidity, and management efficiency on profitability of deposit money banks in Nigeria.

Hypotheses of the study

The following hypotheses in null form were formulated and tested in this study:

- H₁: Asset quality has no significant effect on profitability of deposit money banks in Nigeria.
- H₂: Bank size has no significant effect on profitability of deposit money banks in Nigeria;
- H₃: Capital adequacy has no significant effect on profitability of deposit money banks in Nigeria;



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- H₄: Financial Leverage has no significant effect on profitability of deposit money banks in Nigeria;
- H₅: Liquidity has no significant effect on profitability of deposit money banks in Nigeria;
- H₆: Management efficiency has no significant effect on profitability of deposit money banks in Nigeria;

Significance of the Study

The findings of this study are of particular importance to various interest parties. The various scholars and other researchers interested in the determinants of profitability of deposit money banks will benefit from the findings of this study. The study would be beneficial to the academic circle through the findings that are aimed at contributing to the existing knowledge gap in literatures of determinants of profitability. The study would be significant to market players such as investors in carrying out investment decisions on profitable institutions as well as regulatory authorities in formulation sound regulatory policies.

Scope of the Study

The study examined the determinants of profitability of listed deposit money banks in Nigeria from 2007 to 2021. The justification behind the choice of this period was centered on the post consolidation exercise of 2005, global financial crisis of 2008, commencement of International Financial Reporting Standard (IFRS) adoption in Nigeria, economic recession of 2016 and the global COVID 19 pandemic. All these events had impact on the profitability of deposit money banks locally and globally.

2. Literature Review

Conceptual Framework

The framework that guided this study is depicted in Figure 1.

Independent Variables

Asset Quality
Bank Size
Capital Adequacy
Financial Leverage
Liquidity Management
Management Efficiency

Dependent Variable



Figure 1: Conceptual framework of the study

Concept of Profitability

Profitability refers to earnings generated from business activities of corporate organisation after deducting all expenses incurred for the purpose of income. Devi and Devi (2014) define corporate profitability as the level to which an organization can successfully and efficiently make the most of its obtainable funds and assets, and alter them into outstanding profits. A bank's main assets are its loans to borrowers and institutions, while its main liabilities are the deposits and loans secured from other



institutions and sales of debt instruments. The existence, growth, and survival of a business organization mostly depend upon the profit, which an organization can earn.

According to Achema, Nyor, and Agbi (2022), the measures of bank profitability can be seen in terms of return on assets (ROA), return on equity (ROE) and in some cases, the net interest margin (NIM). However, in this study, return on assets is considered as the measure of profitability.

Concept of Asset Quality

Asset quality is a crucial component for determining a bank's overall condition. Loans often make up the majority of a bank's assets and pose the largest risk to its capital. The ratio of a bank's non-performing loans to total loans is used to calculate asset quality. Asset quality and profitability in the banking sector have generated findings that are positively or negatively significant in the determination of profit.

Concept of Bank Size

The size of a bank has numerous effects on its profitability. Large banks have the advantage of economies of scale, which leads to efficiency when compared to small banks. Small banks are likely to experience difficulties competing with major banks in highly competitive marketplaces since they have less authority (Hailegebreal, 2016). Bank size is determined by logarithm of total assets (Hifza, 2011). Thus, in this study, bank size was calculated as a natural logarithm of total assets.

Concept of Capital Adequacy

Capital adequacy is a measure of a financial institution's financial strength or soundness in terms of its capacity to bear operating and extraordinary losses. It is viewed as a tool for protecting, ensuring, and promoting the financial system's stability and efficiency Nwankwo (1991) defines capital adequacy as the level of equity that is sufficient to absorb any shocks that the bank may encounter. Capital adequacy is critical to bank performance in a variety of ways, including bank stability and strength, future expansion, and public confidence, and well-capitalized banks can serve clients' interests while protecting institutions from unexpected loss (Furlong 2008). Capital adequacy is the amount of capital required for a bank to achieve its financial health and soundness. It is measured through Tier one plus Tier two divided by Risk Weighted Assets.

Concept of Financial Leverage

The amount to which banks employ borrowed funds (debts financing) to boost profitability is referred to as leverage. It is calculated as dividing total liabilities by total equity (Alkhatib, 2012). Financial leverage is the element of a bank's loans or borrowed money that is used only to finance the bank. High leverage level scan actually add value to banks since the necessity to meet repayment schedules under debt covenants disciplines management to act in ways compatible with shareholders' wealth maximization objectives. The debt-to-equity ratio is used to calculate leverage.

Concept of Liquidity Management

Liquidity depicts the ability of a bank to fulfill its short-term obligation. Liquidity 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 (Olang, Akenga & Mwangi, 2015). Generally, two schools of thought exist on liquidity and profitability dynamics. Liquidity is a crucial concern for banks, as a shortage can



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led to failure (Kumar & Agarwal, 2012). Financial sector regulators view liquidity as a major concern, as banks with weak liquidity risk corporate failure and ultimately cease to exist (Ehiedu, 2014).

Proper management of liquidity can significantly impact a bank's success or failure. Liquidity can be measured using the ratio of current assets to current liabilities, cash and short-term marketable securities, or cash and short-term marketable securities (Maroa & Kioko, 2016; Pandey, 2005). The ratio of current assets to current liabilities serves as a proxy for liquidity, reflecting banks' ability to meet maturing obligations.

Concept of Management Efficiency

Management quality or efficiency significantly impacts a bank's future, as it oversees operations, loans, and ensures profitability. Efficiency measures resource utilization and maximizes profits by minimizing waste and maximizing outputs. A high level of efficiency leads to lower input costs and a competitive edge in the marketplace. Efforts to improve efficiency can enhance profits under any strategy.

Management efficiency can be evaluated with reference to expenditure to income ratio, credit to deposit ratio, Asset utilization ratio, diversification ratio, earnings per employee ratio and expenditure per employee ratio (Sangmi & Nazir, 2010). In this study, the ratio of expense-to-income is used as a measure of management efficiency. The Expense-to-income ratio demonstrated the relationship between the operating costs and total generated revenues. The higher ratio depicts inefficient while the lower ratio shows the efficient of management that resulted higher profit.

Theoretical Review

The study on determinants of profitability is explained by structure-conduct-performance (SCP) paradigm theory, relative market performance hypothesis (RMPH) theory, efficiency structure hypothesis (ESH) theory, X-efficiency hypothesis (XEFF) theory, quiet-life hypothesis theory, and scale-efficient firm hypothesis (SEFF) theory. However, the study is underpinned by efficiency structure theory because it is centered on institutional efficiency and its impact to reduce cost and enhance profitability.

The efficiency structure hypothesis (ESH) offers a clearer perception of the possible relationship between market structure and firm performance. The ESH posits that when efficient firms behave aggressively in the market, their market shares and size improve. These foster their political strength, aid their ability to control prices and output, and eventually maximize their profits in their respective market (Lloyd-Williams, Molyneux and Thornton, 1994). It also lays credence to the positive association between concentration and profit, which emanates from highly efficient production processes and management that lower costs of production.

Review of Empirical Studies

Assets Quality and Profitability

Credit risk impacts a bank's health, affecting its assets' quality, exposure to risks, non-performing loans trends, and borrowers' profitability (Baral, 2005). Bank profitability relies on foresight, avoiding, and monitoring risks, potentially covering losses (Aburime, 2008). Lucky and Nwosi (2015) studied the relationship between asset quality and profitability of 15 commercial banks in Nigeria from 1980 to



2013 and with focus on the association between CAMELS criteria and profitability performance. The findings showed a positive relationship between non-performing loans and return on investment. In a similar vein,

Saliu, Idih, and Adewole (2020) examined the impact of non-performing loans on Nigerian deposit money banks' performance. The study used time series secondary data from 1986-2018 and used the Auto Regression distribution lag (ARDL) bound to analyze the long-run relationship between non-performing loans and DMB performance. The study found a significant long-run relationship between non-performing loans and performance.

Achema, Nyor, and Agbi (2022) studied the impact of asset quality (non-performing loans) on bank profitability in the Nigerian banking sector. They analyzed data from 14 listed deposit money banks, focusing on the relationship between ratios, customer deposits, loss provision, and return on assets (ROA). The study found that loans loss provision to total assets had a significant negative effect on ROA, while non-performing loans to total loans had an insignificant negative effect. Ofoegbu and Adegbe (2022) studied the impact of asset quality on deposit money bank performance in Nigeria, focusing on the influence of return on assets. The study involved sixteen Nigerian stock exchange-listed banks from 2009-2018, with a sample size of 10 leading banks. The dependent variable profitability was modeled by return on assets, while assets quality was measured by non-performing loans. The findings showed that assets quality significantly impacted the assets of Nigerian banks, making it a major determinant of performance.

Bank Size and Profitability

Large banks have more competitive power, as they have a larger market share and can work in areas with high capital rates, allowing them to compete more effectively with smaller competitors. Aza (2018) investigated the impact of firm size on the financial performance of Nigerian deposit money banks on the Nigeria Stock Exchange. The study used a descriptive research design, drawing a sample of five banks using Yaro Yemeni sampling to represent the entire Nigerian banking industry. The explanatory variable was bank size, while the dependent variable was financial performance measured by return on asset. The findings showed that bank size had an insignificant negative impact on financial performance.

Aminu (2021) conducted an analysis on the impact of firm size on the profitability of 16 listed deposit money banks in Nigeria from 2005 to 2014. The result reveal that the independent variable of firm size had an insignificant positive effect on profitability proxies of ROA and ROE.

Egbuhuzor and Wokeh (2022) examined the effect of firm size on the financial performance of 13 listed deposit money banks in Nigeria from 2009 to 2018. The descriptive statistics and Multiple regression were used and analysed the data collected. The result revealed that there is no significant effect of bank size as measure in (total asset and total revenue) on financial performance of listed deposit money banks in Nigeria.

Capital Adequacy and Profitability

Capital adequacy is the required capital by regulatory and supervisory authorities to ensure the bank's financial health and soundness (Ejoh & Iwara, 2014). Dickson and Mutaju (2015) studied the



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determinants of commercial banks' profitability in Tanzania on eighteen commercial banks from 2000-2011. The independent variables among others include capital adequacy while profitability was proxied by Return on Asset (ROA). From the use of Panel EGLS (Cross-section random effects) to analyse the data, the results indicated that capital adequacy which is proxy by total capital to RWA positively influences profitability. Similarly, Macharia (2016) studied the profitability of Kenyan commercial banks using secondary data from 43 banks from 2011 to 2015. Results of ordinary least squares (OLS) regression showed a significant negative relationship between capital adequacy and profitability. The study found that capital plays a crucial role in determining profitability.

Iacobelli (2017) investigated the determinants of profitability 43 registered commercial banks in Nigerian from 2011 to 2015. While profitability was proxied by return on assets, the study found a negative relationship between capital adequacy and banks' profitability. Also, Saheed (2018) carried out the study on determinants of 14 listed deposit money banks' profitability in Nigeria from 2008 to 2016 with the aim to explore the factors that determine profitability. The results showed that capital adequacy positively correlated with bank profitability.

Hai et al. (2020) studied the profitability of listed commercial banks in Vietnam using descriptive statistics, and OLS regression analysis of 10 banks from 2008 to 2018. The findings showed that capital size was statistically inconsequential.

Agbeja, Adelakun, and Olufemi (2015) conducted a study on the relationship between capital adequacy ratio and bank profitability of 24 commercial banks in Nigeria. The findings revealed a significant relationship between capital adequacy ratio and bank profitability. Nguyen (2020) studied the impact of bank capital adequacy on bank profitability under the Basel II Accord in Vietnam. The study collected secondary data from 22 Vietnamese commercial banks for five years, covering the period of 2014 to 2018. The study considered bank profitability as a dependent variable and measured by return on assets and return on equity. Other determinants of profitability included capital adequacy as bank-specific variable. The findings showed that bank capital adequacy had a significant positive impact on profitability.

Financial Leverage and Profitability

Abor (2005) described leverage as the part of the assets of a company that has been financed by the use of debt. One of the outcomes of a firm being highly levered is the risk of being bankrupt if the company is not able to meet the interest obligation on the debt. Moses and John (2014) conducted a study on the impact of financial leverage on the financial performance of deposit-taking savings and credit co-operatives in Kenya. The sample of the study consist of 135 licensed deposit-taking Saccos in the Kenyan Co-operative industry, registered by the Sacco Society Regulatory Authority (SASRA). The study found a strong relationship between financial leverage and financial performance in Kenyan Saccos.

Abiodun and Usman (2020) examined the linked between Leverage and Financial Performance of 14 Listed Deposit Money Banks in Nigeria from 2009 to 2018 and with emphasis on the effect that financial leverage may have on financial results of deposit money banks that operate in Nigeria. Multiple regression was employed as the means of analysis with the aid of STATA 13. The result of the study indicated that debt financing strongly impacted on the financial performance.



Imeokparia, Adesanmi and Fadipe (2021) conducted a comparative study on the impact of financial leverage on financial performance in Nigerian deposit money banks and manufacturing companies. The study involved 24 deposit money banks and 54 manufacturing companies, with a sample of ten banks and ten companies. The dependent variable was return on assets (ROA), while total debt ratio, total debt to equity ratio, and interest cover ratio were proxied for leverage. Firm size was introduced as a control variable. The study found that total debt ratio and total debt-equity ratio had a strong negative effect on the financial performance of the sampled deposit money banks, while total debt ratio had an insignificant positive effect and total debt to equity ratio was negatively significant on the financial performance of selected manufacturing companies in Nigeria.

Abdul and Raj (2021) studied the relationship between leverage, capital, and profitability in Saudi Arabian banks. They selected five banks based on their total assets and data availability. They calculated different ratios for dependent and independent variables, including earnings per share (EPS), return on assets (ROA), and return on equity (ROE). The results showed a positive association between financial performance variables and debt to equity.

Liquidity Management and Profitability

Liquidity management is crucial for commercial banks, as it measures their needs related to deposits and loans. A high liquidity ratio indicates a less risky and less profitable bank. However, increased liquidity can also reduce management's ability to commit credibly to investment strategies that protect investors, potentially reducing the bank's capacity to raise external finance. Tanveer et al. (2017) conducted an empirical investigation to analyze the impact of liquidity management on the profitability of Pakistani banks for a period of eleven years. Return on assets (ROA) and return on equity (ROE) were used as measures of bank's profitability while Current Ratio (CR) advances to deposit ratio (ADR), Cash deposit ratio (CDR) and Deposit Assets Ratio (DAR) represented the measurement of liquidity management. Purposive sampling technique was used to accessed the data based on proximity and availability. The results revealed that ADR, CDR and DAR has positive and significant impact on ROA whereas negative and significant impact on ROE. CR, ADR, CDR and DAR have positive and significant impact on ROE. The study concluded that the profitability of banks was influenced by liquidity management.

Fagboyo et al. (2018) studied the impact of Liquidity Management on Profitability in Nigeria's Banking Sector. With a population of 24 deposit money banks and a sample of 5 banks over a period of 10 years from 2007 to 2016, the study found a negative relationship between the cash ratio, quick ration and ROE but has a positive relationship with ROA.

Osasere and Billyaminu (2020) conducted a comparative study on liquidity management and its impact on the profitability of Islamic and conventional banks in Nigeria. The study sample consisted of Jaiz bank and First Bank Plc, representing the largest and oldest conventional banks in Nigeria. Quarterly data was collected from annual financial reports and time series data from the quarterly bulletins of selected banks from 2012-2019. The ordinary least square estimation technique was used to capture the relationship between liquidity and profitability. The results showed that profitability and liquidity have an inverse relationship in both conventional and Islamic banks, with profitability following the risk-return trade-off.



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Akinroluyo and Dimgba (2022) conducted a study on Nigerian deposit money banks' liquidity ratio and return on equity on 5 listed deposit money banks in Nigeria from 2006 to 2020. The study used the Ordinary Least Square (OLS) regression model and E-views. The results showed a significant relationship between current ratio and operating efficiency, while acid test ratio significantly affected financial leverage. The study recommends Nigerian banks maintain optimal liquidity ratios to achieve efficiency and reduce operational expenses, ultimately increasing profitability.

Management Efficiency and Profitability

Management quality refers to the board's ability to identify, measure, and control risks in an institution's activities, ensuring safe, sound, and efficient operation in compliance with laws and regulations. Ihenetu and Iwo (2017) analyzed Nigeria's bank performance using the Camel model to evaluate the impact of management efficiency on profitability for 21 deposit money banks operating in Nigeria. The dependent variable was profitability which is measured by profit before tax, and the independent variables of management efficiency among others. The results showed that management efficiency had no significant impact on the profitability of Nigerian banks.

Omete, Namusonge and Sakwa (2019) examined financial management efficiency and financial performance of commercial banks listed on the Nairobi Securities Exchange. The study population targeted commercial banks listed on the Nairobi Securities Exchange for the period 2006 to 2017. The dependent variable was financial performance, measured by the return on assets and return on Equity. The explanatory variables were financial management efficiency, represented by capital adequacy, liquidity, financial leverage and market capitalization. The result revealed a strong and positive relationship between financial leverage and financial performance of commercial banks

Dsouza et al. (2022) conducted an empirical analysis using panel data to determine the impact of bank efficiency on the profitability of Indian banks. The study used a panel data approach, analyzing 527 bank-year observations for 33 Indian banks from 2001 to 2020. The results showed that the cost to income ratio had a significant negative influence on bank profitability, while the staff expenses to total expenses ratio had a significant positive effect on bank return on assets.

3. Methodology

Descriptive and correlational designs was adopted in this study because they allowed the researcher to measure variables and described the relationships between the independent variables and dependent variable used.

Population and Sample Size of the study

The population of study is twenty-four (24) Deposit Money Banks licenced by the Central Bank of Nigeria as at 31st December, 2021. The population was filtered using the following criteria: all banks must be listed with the Nigerian exchange group from January 1st, 2007 to December 31st, 2021; data must be available for these DMBs within the period of study from 2007 to 2021.

Model Specification

In order to assess the determinants of profitability, panel regression model adapted from Dinah (2016) was employed where the dependent variable is profitability which is measured by Return on Assets (ROA). The regression model for the study is shown below:



Where: ROA = Return on asset; ASQ = Asset quality; BAS = Bank size; CAD = Capital adequacy; LEV = Leverage; LIQ = Liquidity management; MEF = Management efficiency; ε = error term; β_0 = Intercept; β_1 to β_6 = Coefficient Parameters; t = time period 2007-2021; I = Bank .

Variables, Definitions, Measurements and Sources

The variables, definitions, measurements and their sources used in this study are presented in table 1.

$$ROA_{it} = \beta_0 + \beta_1 ASQ_{it} + \beta_2 BAS_{it} + \beta_3 CAD_{it} + \beta_4 LEV_{it} + \beta_5 LQM_{it} + \beta_6 MEF_{it} + \varepsilon_{it} \dots \dots \dots \text{equation 1}$$

Table 1

Variables, Definitions, Measurements and Sources

Type of Variable	Variable	Measurement	Definition	Source
Dependent	Profitability	Return on assets	Profit before to total assets	Mustapha (2017)
Independent	Asset Quality	Ratio of non performing loans to gross loans.	Higher ratio indicates poor asset quality	Prudential Guidelines (2010) & Eyup, Niyazi & Nurcan (2017)
Independent	Bank Size	Logarithms of total assets	Natural logarithm of total assets	Njoroge (2016)
Independent	Capital adequacy	Capital Adequacy	$\frac{\text{Total tier 1 capital}}{\text{Risk weighted assets}} \times 100$	Roman & sargu (2013) Prudential Guideline (2010),
Independent	Financial leverage	Leverage ratio	Total debt to total equity	Olha, Viktoriia and Roksolana (2018)
Independent	Liquidity management	Loan ratio	Total loan to customer deposit	Wachira, Gregory and Fred (2017) Shrestha (2018)
Independent	Management Efficiency	Efficiency ratio	Operating expense to total asset	Imhanzenobe (2019)

Source: Field Work, 2021

Sources and Methods of Data Collection

The data used in this study was sourced secondarily from audited annual reports of DMBs in Nigeria and Central Bank of Nigeria statistical bulletins. Data were sourced from the annual reports and accounts of the sampled banks for fifteen-year period from 2007 to 2021.

Data Analysis Techniques

A descriptive statistic (univariate analysis) and the multiple linear regression was used to test the significance of the independent variables on the dependent variable. The study used a descriptive analysis to ascertain the correlation between the independent variables and the dependent variable.

Diagnostic and Post Estimation Tests

The diagnostic and post estimation test conducted in this study include normality test, multicollinearity test, heteroskedasticity test. All these tests were carried out to ensure the validity of the data and fitness of the model.

Results and Discussion

To achieve the objective of this study the descriptive and regression results were analysed to provide findings and draw conclusions.



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Descriptive Statistics

Table 2 reports the mean, standard deviation, minimum and maximum of all variables used in the study.

Table 2

Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
ROA	180	0.022	0.064	-0.531	0.310
ASQ	180	0.139	0.204	0	0.987
BAS	180	8.934	0.493	7.647	9.967
CAD	180	0.566	0.683	0.011	4.581
LEV	180	5.410	3.337	0.001	18.372
LQM	180	0.639	0.220	0.002	1.117
MEF	180	0.052	0.044	0.001	0.507

Source: Result Output from STATA 14.2

Table 2 shows that there are 180 (15x12) observations. The ROA indicates that on average Deposit Money Banks in Nigeria earns a positive income over the sampled period. During the period, the mean ROA of the sampled banks is 0.022 (about 2.2%) with a minimum of -0.531 and a maximum of 0.310. The positive value implies that for every ₦1 invested in the selected deposit money banks, ₦0.022 is gain from that investment. Assets Quality (ASQ) has a mean value as 0.139 ($SD = 0.204$). This implies that non-performing loans of Deposit Money Banks in Nigeria are on average 13.9% of the gross loans of the banks in Nigeria. This has a large dispersion as the minimum and maximum ranges from 0 to 0.987 respectively. Moreover, bank size is 8.934 (N859,013,521) on average with the standard deviation of 0.493. The size of banks ranges from 7.647 to 9.967.

Table 2, also shows the CAD measured as the ratio of Total tier 1 capital to Risk weighted assets. The mean CAD of deposit money banks in Nigeria stands at 0.566 with the standard deviation of 0.683. Minimum value of CAD is 0.011 and the maximum value of 4.581 suggesting wide dispersion in CAD of Deposit banks in Nigeria. The mean CAD is above the minimum, between 10-15% prescribed by the Basel III accord. With the minimum of 0.011 (1.1%) it suggests that there is a bank or an observation when the CAD was below the Basel III accord an indication that if urgent steps are not taken one of the sampled banks will be bankrupt.

Also, the descriptive statistics of LEV was presented in Table 2. Given the measure of LEV which is total debt to total equity, the minimum value to 5.410 depicts that total debts are over five times more than equity capital of banks in Nigeria with a standard deviation of 3.337. The LEV ranges from a minimum of 0.001 to a maximum of 18.372 suggesting that while other banks have very low total debt relative to equity others have total debts which covers equity by more than eighteen times. Liquidity management (LQM) measured as the proportion of total loan to customer deposit has a mean value of 0.639 with a standard deviation of 0.220. The mean value suggests that about 63.9% of customer deposits is given out as loans. LQM has a minimum and maximum value of 0.002 and 1.117 respectively.



Finally, management efficiency (MEF) measured as ratio of Operating expense to total asset resulted to the average of 0.052 ($SD = 0.044$) reflecting that the operating expenses of deposit money banks in Nigeria is about 5.2% of the total assets of the banks. This varies from the minimum of 0.001 and a maximum of 0.507.

Results of Diagnostic and Post Estimation Tests

The normality implies that residuals follow a normally distributed. It is assumed that the residuals in the model are random, normally distributed variables with a mean of 0. This assumption simply means that the differences between the model and the observed data are most frequently zero or very close to zero, and that differences much greater than zero happen only occasionally. Another important assumption is homoscedasticity or constant residuals. When the variances are unequal there is said to be heteroscedasticity. Breusch-Pagan White test was conducted to check this assumption. The result of Breusch-Pagan White test shows that $X^2 = 0.08$, $p = 0.7708$, confirming that there is no heteroscedasticity problem.

Correlation Matrix

Table 3 displays the correlation values between regressors to check if there is multicollinearity. The presence of multicollinearity inflates the standard errors. Results of multicollinearity is reported in Table 3.

Table 3

Pairwise correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)
(1) ASQ	1.000					
(2) BAS	-0.085	1.000				
(3) CAD	0.024	-0.222	1.000			
(4) LEV	-0.016	0.420	-0.405	1.000		
(5) LQM	-0.218	0.138	-0.025	-0.117	1.000	
(6) MEF	0.140	-0.198	0.035	0.150	-0.055	1.000

Source: Result Output from STATA 14.2

The rule-of-thumb is that correlation coefficients above ± 0.8 indicates multicollinearity. Since correlation coefficients for the variables ranges from -0.405 to 0.420 the independent variables are not strongly correlated, meaning that no one independent variable significantly influences the other independent variable.

Panel Effects Test

Panel data comprising of both the cross-sectional and time series dimensions was employed thus, Hausman test was carried out to check the panel effect. The result of the Hausman test was insignificant, thus, a conclusion was made that random effect model is most appropriate than fixed effect model. Finally, Breusch-Pagan LM test was conducted to decide between the random effect and pooled ordinary regression analysis. The result of LM test was also statistically significant suggesting that a pooled ordinary least squares regression was most efficient estimator.



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Regression Results and Discussions

In line with the objectives, regression equation was estimated after the data analysis process in order to analyze the determinants of profitability of deposit money banks in Nigeria. The results from the regression are reported in Table 5. The table report model fit the R-square, adjusted R-square and standard error of estimates.

Table 4
Linear Regression Results

ROA	Coef.	St.d Err.	t-value	p-value	[95% Conf	Interval]	sig
ASQ	-0.0760	.0211	-3.61	.000***	-.118	-.034	***
BAS	0.0095	.0098	0.97	.334	-.01	.029	
CAD	0.0372	.0067	5.55	.000***	.024	.05	***
LEV	0.0004	.0016	-0.23	.821	-.003	.003	
LQM	-0.0617	.0199	-3.10	.002***	-.101	-.022	***
MEF	-0.2499	.1011	-2.46	.015***	-.449	-.049	**
Constant	-0.0193	.0857	-0.23	.822	-.188	.15	
R-squared	0.272		Number of obs		180		
F-test	10.789***		Prob > F		0.000		
Akaike crit. (AIC)	-523.441		Bayesian crit. (BIC)		-501.090		

*** $p < .01$, ** $p < .05$, * $p < .1$, *** represent significant

Source: Result Output from STATA 14.2

R-Square (called the coefficient of determination) from Table 4 indicates the proportion of the variance of performance that is explained by variation in the chosen determinants. Table 4 gives the R-squared (R^2) of 0.272. The F -statistics test the overall model fitness; that is, it tests whether none of the explanatory variable is significantly related to the dependent variable, in other words, that R^2 is zero. Table 4 reports that F -statistic is statistically significant ($F = 10.789, p < 0.001$). This suggest that the model is significantly fit and is better than guessing with the mean. Overall, the ANOVA tells that the model has good degree of prediction of the outcome variable ROA. However, the F -statistic does not tell whether the individual contribution of variables in the model, thus, t -test and the associated p -values were employed. Table 4 gives estimates for these b -values, which indicate the contribution of the predictor to the explanation of the outcome variable. By replacing the b -values in the model in chapter three this study can define the specific models as:

Asset Quality and Profitability\

The first hypothesis was formulated to examine the effect of asset quality on profitability of listed deposit money banks in Nigeria. The hypothesis is re-stated as:

H_1 : Asset quality has no significant effect on profitability of deposit money banks in Nigeria.

Table 4 shows the computed t -values and the associated p -value for the test of this hypothesis. Given the calculated values ($t = -3.61, p < 0.001$) this study rejects the null hypothesis and concludes that asset quality has a significant effect on profitability of listed deposit money banks in Nigeria. This result agrees with Kadioglu et al. (2017) who found that asset quality is one of the principal drivers of banks profitability.

$$ROA_{it} = -0.019 - 0.076ASQ_{it} + 0.01BAS_{it} + 0.037CAD_{it} + 0LEV_{it} - 0.062LQM_{it} - 0.249MEF_{it} + \varepsilon_{it}$$



Bank Size and Profitability

The next hypothesis in this study tests the influence of bank size on the profitability of listed deposit money banks in Nigeria. For guidance, the hypothesis is re-stated as:

H₂: Bank size has no significant effect on profitability of deposit money banks in Nigeria.

Table 4 presents the necessary statistics to enable a test of hypothesis two. According to the table the calculated value of $t = 0.97$, $p = 0.334$ therefore, this study accepts the null hypothesis and concludes that bank size has no significant effect on profitability of deposit money banks in Nigeria. The positive coefficient suggests that larger banks in terms of assets base earn higher profitability than smaller banks however, the size of the difference in profitability measured by ROA is not statistically significant. The study supports the findings of Niresh and Velnampy (2014) and Ramasamy (2005). However, the result did not support the findings of Adlina (2015).

Capital Adequacy and Profitability

The third hypothesis that was tested in this section of the study examines the influence of capital adequacy of profitability of deposit money banks in Nigeria. The hypothesis was also re-stated as:

H₃: Capital adequacy has no significant effect on profitability of deposit money banks in Nigeria

Table 4 reports the t -statistics, p - values and the 95% confidence interval to enable a test of the third hypothesis. Given that the calculated value of t -statistics reported in Table 4 ($t = 5.55$, $p < .0001$) which is more than the critical value (± 1.96), this study rejects the null hypothesis (H_{03}) and concluded that capital adequacy has a significant effect on profitability of listed deposit money banks in Nigeria. The result implies that holding all other factors constant a unit in capital adequacy ratio will lead to 0.037 increase in ROA of deposit banks in Nigeria. The positive and significant relationship between capital adequacy and bank profitability suggests that banks with more capital are considered safer and this advantage can translate into profitability. The finding in this study relating to H_{03} agrees with Birhanu (2018). However, the finding in this study is contrary to the finding of Macharia (2016) who investigated influence of capital adequacy on profitability of Kenyan commercial banks from 2011 to 2015 and found a significant negative relation between capital adequacy and banks' profitability.

Leverage and Profitability

This study also tests and discusses the third hypothesis which was about an examination of the role of financial leverage in the profitability of deposit money banks in Nigeria. The hypothesis was also re-stated as:

H₄: Leverage has no significant effect on profitability of deposit money banks in Nigeria.

From the analysis reported in Table 4 this study accepted the null hypothesis H_{04} and concluded that leverage has no significant effect on profitability of deposit money banks in Nigeria ($t = -0.23$, $p = 0.821$). The finding is similar with Bunyaminu et al. (2021) that also found that leverage negatively and significantly affects banks' profitability. This lends support for the pecking order theory.

Liquidity Management and Profitability

The fifth objective and the corresponding hypothesis in this study was to examine the effect of liquidity on the profitability of deposit money banks in Nigeria. The hypothesis was re-stated as:

H₅: Liquidity has no significant effect on profitability of deposit money banks in Nigeria;



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Table 4 reports the t -statistics, p -values and the 95% confidence band on the variables to enable a test of this hypothesis. Given that the calculated value of t -statistics reported in Table 4 is more than the critical value which is 1.96 ($t = -3.10$, $p = .002$), this study rejects the null hypothesis and concluded that liquidity has a significant effect on profitability of listed deposit money banks in Nigeria. The result agrees with many other previous studies; for example, Molyneux and Thornton (1992), Tran et al. (2016), and Goddard et al. (2013). The results are in contrast to Eichengreen and Gibson (2001) and Islam and Nishiyama (2016).

Management Efficiency and Profitability

The last objective in this study was an assessment of the effect of management efficiency on the profitability of deposit money banks in Nigeria. To achieve this objective, the hypothesis was also re-stated as:

H_0 : Management efficiency has no significant effect on profitability of deposit money banks.

Table 4 reports the needed information (t -statistics, p -values) at 95% confidence level required to test of this hypothesis. From Table 6 $t = -2.46$, $p = .015$. Given that the calculated t -statistics is greater than the critical value at 5% level of significance, this study rejects the null hypothesis and concluded that management efficiency has a significant effect on profitability of listed deposit money banks in Nigeria. Similar to this study other researchers such as Al-Homaidi et al. (2018) also found that management efficiency negatively and significantly influences profitability of deposit banks. Though, the study of Macharia (2016) documented an insignificant negative relationship on banks' profitability. Contrary to the result of this study is the study of Birhanu (2018) found that management efficiency has statistically significant and positive relationship with bank's profitability.

Emanating from the findings, this study concludes that assets quality, capital adequacy, liquidity and management efficiency are the main factors that determine the profitability of listed DMBs in Nigeria, while bank size and leverage are not significant determinants of profitability of listed deposit money banks in Nigeria. Based on findings the following recommendations were made:

- i. The management of DMBs in Nigeria should carefully monitor and control their loans to ensure loans quality (assets quality) to increase their profitability. Careful monitoring of loans would translate to loans quality and consequently profitability.
- ii. Current and potential investors should not predict the profitability of DMBs in Nigeria using size proxied by total assets. This is because empirical findings in this study revealed that size is not a factor that significantly influence the profitability of DMBs in Nigeria.
- iii. Deposit money banks in Nigeria should increase their capital to increase profitability. Deposit money banks should look in to reducing the amount they pay to shareholders as dividend, instead using it to raise the capital to improve profitability.
- iv. Management of DMBs should employs policies such as staff and customers re-orientation in order to make them financially disciplined. This re-orientation will in the future change the current mindset that debts capital (leverage) is extra revenue (free lunch).
- v. Management of listed deposit money banks should pay attention to liquidity management as a way of significantly increasing their profitability. This is as per the school of thought which says that the relationship between liquidity and profitability is tradeoff, implying that the pursuit of one will automatically take a toll on the other.
- vi. Management of DMBs should finally employ more cost-saving strategies to operating expenses (enhancing management efficiency) in order to significantly improve their banks profitability.



Contributions to Knowledge

The key contributions to knowledge made by this study are: first, the study used current data and included the period of Covid-19 pandemic that affected borrowers' capacity to service loans, which give rise to nonperforming loans that depress banks' earnings and eventually impaired their soundness and stability. However, the study discovered that more bank customers have embraced digital banking platforms which could result in higher electronic banking income for banks. Applying the efficiency theory, the study has shown that management efficiency not only increases profits, but also results to larger market share gains and improved market concentration of DMBs in Nigeria. Second, the study reveals that there exists simultaneous causality relationship between profitability, and its determinants. When this relationship is not considered in determining factors affecting profitability there may be inconsistent evidence on the existence of mission drift.

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