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INTEREST RATES AND RETURN ON EQUITY OF DEPOSIT MONEY BANKS IN NIGERIA (1990-2024)

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ABSTRACT

This study investigated the effects of interest rates on return on equity of Deposit Money Banks in Nigeria between 1990 and 2024. Banking lending rate, bank deposit rate, treasury bills rate and monetary policy rate were the variants of interest rate considered and ROE of Nigerian banks was regressed on them. Data on these variables were collected from the World Bank and Central Bank of Nigeria (CBN) statistical bulletin for 2024. The Autoregressive Distributed Lag (ARDL) analytical technique was used for data analysis and results revealed that in the short run, bank lending rate and monetary policy rate have direct effects on ROE while bank deposit rate and treasury bills rate have inverse effects on ROE of banks. However, only the effect of monetary policy rate was insignificant. It was also revealed that there is a long run equilibrium relationship between interest rates and ROE of banks in Nigeria and the speed of adjustment in event of disequilibrium is 75.03% per annum. The study therefore inferred that interest rate has significant effects on return on equity of Deposit Money Banks in Nigeria. On this note, it was suggested that there is need for Deposit Money Banks to offer competitive and improved deposit rates which will attract more deposits from their customers; Deposit Money Banks should do well to reconsider their high lending rates so as to arrest the high incidence of loan default in the system and to increase the return of shareholders; the monetary authority in Nigeria should not allow Deposit Money Banks to keep excess reserves in order for prevailing monetary policy rates to be able to meet the goals they were made to meet; and there is need for another wave on interest rate deregulation so that lending and deposit rates can truly reflect the demand and supply of funds in the Nigerian banking system.

KEYWORDS: Interest Rate, Return on Equity, Deposit Money Banks.

Introduction

Deposit Money Banks in Nigeria are otherwise known as commercial banks. The name Deposit Money Banks reflects their core function of accepting deposits and creating money through lending. In Nigeria, bank deposits consist majorly of demand deposits, time deposits, savings deposits and foreign currency deposits (Baba & Ashogbon, 2019). These classes of deposits come from private individuals, firm; state, local and federal governments (CBN, 2024). Out of these deposits, banks create money by extending loans and advances to customers who end up depositing the loans collected in other banks for onward lending by the new banks. The process continues and the money in the banking system keeps increasing. Thus, in the course of accepting deposits from customers and extending loans and advances, Deposit Money Banks engage in the act of financial intermediation which enhances economic activities. Here, those who have surplus funds deposit their funds with the banks and are entitled to interest rate called deposit rate and the banks in turn give out part of these deposits as loans and advances to those in shortage of funds and the banks are entitled to an interest rate called lending rate. This intermediation process generates profit for the banks as the spread between lending rate and deposit rate constitute gains (Obagunwa & Akinwale, 2018).

Deposit Money banks as commercial entities are owned by a group of people called shareholders. These shareholders are ever interested in the profit these banks post year-in-year-out. If for any reason, these banks do not post profit, it leads to agency

conflict because the management of banks is hired by the owners to meet up with the profitability needs of these owners (Khan & Satter, 2024). However, while management tries to pursue other objectives like liquidity and solvency; they always keep as eye on profitability so as to avoid conflict with their principals. The profitability of banks is measured using key indicators like return on equity (ROE), return on asset (ROA), net interest margin (NIM) and return on capital employed (. But for shareholder, the concern is on return on equity. Return on equity is a key profitability ratio that measures a bank's ability to generate profit from shareholders' stake or equity investment in a bank. It is so much relied upon by shareholders as a way to gauge the performance of their agent, the management team of bank. This indicator as such indicates how effectively management uses equity capital to generate earnings (Onigah, 2024). As a profitability performance indicator, a higher ROE often attracts investor seeking returns. Thus, ROE is a financial performance signpost that reflects how well equity is deployed for profit. In other terms, it is a performance benchmark that serves as a metric used by monetary and regulatory authorities to compare banks in the same industry and/or different industries for relative performance. This is why a high ROE suggests strong profitability relative to equity. Consequently, a consistent ROE indicates stable performance which can serve as well as a sustainability index. As an essential performance indicator, advanced financial analysis like the DuPont analysis breaks ROE into components like profit margin, asset turnover and equity multiplier for deeper insight (Afza, Raja, Imran & Saima, 2018; Alhassan, Anokye & Gakpetor, 2018).

The ROE of a bank nonetheless is affected by countless factors and variables. One of such is interest rate which in Nigeria basically consists of lending rate, deposit rate, monetary policy rate and treasury bills rate (Ekle, 2021). On this backdrop, the Central Bank of Nigeria (CBN) oversees capital adequacy, which impacts ROE dynamics. Again, competition and/or market rivalry affects profitability metrics like ROE. Finally, economic conditions which are macroeconomic factors like exchange rate, inflation rate, economic growth (Gross Domestic Product) and the likes influence banking sector ROE. A favorable economic condition is expected to lead to a boom which should increase the ROE of banks and vice versa for an unfavourable economic outlook which should contract economic activities (Agu, 2020; Ibikunle & James, 2021).

Accordingly, Deposit Money Banks are quintessential for the growth and development of an economy. Given their role they are the most regulated financial institution in the world (Maigua & Mouni, 2016). In this line, one way the operational activities of DMBs are regulated, monitored and supervised is through monetary policy. This policy affects the lending, deposit rates and other interest rates of an economy, as monetary policy variation leads to interest rates volatility. This ultimately affects profitability level of banks as expected. There have been different monetary policy regimes in Nigeria to strengthen the performance of Nigerian banks and to stabilize the Nigerian economy. However, there have been countless empirical studies on the effects on interest rates (as monetary policy induced variables) on the performance of banks using return on equity (ROE) as an indicator (Ogoke & Amadi, 2024; Kanwal & Nadeem, 2023; Ariwa & Uremadu, 2023; Gul, 2020; Olalere & Sobhani, 2019; Baba & Ashogbon, 2019; Ahmed, Rehan, Chhapra & Supro, 2018; Musah, Anokye and Gakpetor, 2018; Afza, Raja, Imran & Saima, 2018; Alhassan, Anokye & Gakpetor, 2018). These studies have produced contrasting result as they have reported positive, negative, significant and insignificant effects. Again, amongst the

studies reviewed, it was observed that treasury bills rate, which is a major component of interest rate, has not been given the desired attention in discussing the connection between interest rate volatility and bank performance. Hence, the question that came to mind was: what is the actual effect of interest rates (lending, deposit, treasury bills, and monetary policy rate) on return on equity of Nigerian banks?

REVIEW OF RELATED LITERATURE

Conceptual Review

Interest Rates

Primarily, interest rate is seen as the cost of borrowing money or the return on investment for lending money. Thus, Obagunwa and Akinwale (2018) stated that interest rate is the rental payments for the use of credit by borrowers or the return for parting with liquidity by lenders. It is typically expressed as a percentage of the principal amount and is paid or earned over a specific period, often on an annual basis. Given the nature of banking, interest rates play a crucial role in the operations of commercial banks and the broader financial system. Amadeo (2018) defines it as the percent of principal charged by the lender for the use of its money. The Nigerian apex bank, CBN (2016) sees interest rate as "the cost of borrowing; and shows what a borrower pays to the lender for the use of money. Corb (2022) described interest rate as an economic tool used by the CBN to control inflation and boost economic development; invariably any poor decisions on an interest rate regime could spell doom for the financial system and the economy as a whole and that the CBN usually uses the interest rate as a monetary policy tool to adjust the lending rates of banks and other financial institutions in Nigeria. Makinde (2016) on his part posited that interest rate is the rate that is paid on either savings or lending. It represents the rate of return that is due to the owner of funds for differing present consumption for future consumption. This demonstrates that there is bank interest rate and non-bank interest rate.

Bank Lending Rate

This refers to the interest rate that Deposit Money Banks charge on loans and credit they extend to their customers. In other words, bank lending rate is the interest rate at which banks lend to customers and it is used in many countries by banks. It is referred to in some countries as a prime rate or a prime lending rate. Nevertheless, bank lending rate can vary depending on the type of loan, the creditworthiness of the borrower, prevailing market conditions, and the central bank's policy rates (Shukrani, 2020). Bank lending rate is an essential component of a country's financial system and has a significant impact on individuals, businesses, and the overall economy. Deposit Money Banks offer various types of loans, including personal loans, mortgages, business loans, auto loans, and credit cards. Each of these loan categories have different interest rates based on factors such as the loan term, the risk associated with the borrower, and the prevailing market rates. Deposit Money Banks determine their lending rates based on several factors, including the cost of funds (e.g., interest paid to depositors), operational expenses, risk assessment, and market conditions. The interest rate charged on loans typically includes the bank's cost of funds plus a margin to cover operating costs and generate a profit. According to Ogundipe, Akintola and Olaoye (2020), there are two major types of lending rates in Nigeria; the prime lending rate and the maximum lending rate. Prime lending rate refers to the average prevalent lending rate charged by most deposit money banks in Nigeria to some of its more favored customers. The prime lending rate is also used in calculating rate changes often known as adjustable rate mortgages (ARM) as well as other variable short term loans (Victor & Eze, 2023).

Bank Deposit Rate

The interest rate a bank or financial institution pays on cash deposits is termed a deposit rate. Deposit rates are paid on savings and other investment accounts. It is the interest rate that banks pay to depositors for the use of their savings for the time period of the deposit (Onigah, 2024). Deposit interest rates can either be fixed with a minimum amount for a certain period of time or it can be variable, which implies that it changes often and it is not often subjected to early withdrawal penalties. Cash paid into savings and investments accounts are compensated with a deposit rate. Savings accounts usually receive low interest rates, however, money deposited into other account types are also compensated with a deposit rate by banks and other financial institutions (Victor & Eze, 2023). In essence, deposit rate is the interest rate that a bank pays depositors for the use of their money for the time period that the money is on deposit. It usually differs from bank to bank, some pay higher than others. The longer the money stays with banks the higher the rate it attracts. However, aside savings and fixed deposit rates, the following classes of deposit rates exist in Nigeria: 3-moths deposit rate, 6-months deposit rate, 12-months deposit rate, and over 12-months deposit rate (CBN, 2024).

Monetary Policy Rate

Monetary Policy is a deliberate effort by the central authority of a country e.g. the Central Bank to control the supply of money often targeting interest rates and inflation rates to certify price stability and also to improve the currency (Dwivedi, 2019). Thus, monetary policy rate (MPR), also known as minimum rediscount rate or bank rate is a short term anchor rate designed to influence other money market rates. It is usually fixed to promote policy efficiency. Monetary Policy Rates (MPR) also refers to the interest rates that a country's central bank sets to influence the overall money supply, interest rates in the economy, and ultimately achieve specific monetary policy objectives. It is a fundamental tool used by central banks to manage and control a nation's monetary policy (Ngari, 2023). Changes in monetary policy rate directly affect the interest rates that commercial banks offer to depositors and charge to borrowers. When the MPR is increased, commercial banks tend to raise their lending and deposit rates, making borrowing more expensive and saving more attractive. Conversely, when the MPR is lowered, it encourages borrowing and spending (Gul, 2020). MPR changes have a significant impact on various economic variables, including consumption, investment, inflation, and employment. Higher MPR typically leads to lower borrowing and spending, potentially cooling off an overheated economy and reducing inflation. Lower MPR tends to stimulate borrowing and spending, which can boost economic growth and job creation. Central banks have various tools to influence short-term interest rates, such as open market operations, discount rates, and reserve requirements. The MPR serves as a benchmark for these tools, helping central banks achieve their policy objectives (Olasehinde‐Williams, Omotosho & Bekun (2024).

Treasury Bills Rate

Treasury bills rate is the rate earned from investing in government short term debt obligation securities. The rate is usually higher when time to maturity for the bill is longer, which demonstrates the term structure of interest rate. It is also referred to as a yield on risk free instrument, because it is backed by the government with maturity of usually less than a year (Akinwale, 2018). T-bills can be purchased at auctions held by the government, or from a third party individual or market which has been earlier issued. Treasury Bills bought at auctions are valued through an impartial bidding system at a discounted price from the par value.

When treasury bills are redeem at maturity, they are compensated the par value amount. The difference between the buying price and the par value price is the interest (Akinwale, 2018). For example, if an investor purchases a T-Bill valued at ₦1 million for ₦950,000. When this T-Bill matures, the investor is paid ₦1 million; thereby making ₦50,000 on the investment. T-bills usually mature between a few days to the maximum of 52 weeks. However, common maturities are 91-days, 182-days and 364-days. The longer the maturity date, the T-Bill will pay the investor a higher interest rate (Ekle, 2021).

Return on Equity

Return on equity (ROE) is one of the traditional measures of bank financial performance. It is seen as one of the best performance measurement tool by the investors. It is said to be the most important indicator of a bank's profitability and growth potential. Return on equity is the rate of return to shareholders or the percentage return on each naira of equity invested in the bank (Ahmed, 2019). It also refers to how much profit a bank earns in relation to the total amount invested by shareholders or found on balance sheet. In essence, ROE is what shareholders look out for in return for their investments. A business that has a high return on equity is more likely to be one that is capable of generating cash internally; thus the higher the ROE, the better the bank in terms of profit generation. By extension, ROE is an internal performance measure of shareholders' value, and it is by far the most popular measure of performance because it proposes a direct assessment of the financial return of shareholder's investment (Khrawish, 2021).

Khrawish (2021) noted that the return on equity is ratio of net income after tax and total equity capital. It represents the rate of return earned on the funds invested in a bank by its shareholders. ROE reflects how effectively a bank management is using shareholders' funds; thus it can be deduced from the above statement that the better the ROE, the more effective the management is in utilizing its shareholders capital. ROE is calculated by taking net income after tax of a given year and dividing it by the book value of equity at the beginning of the year. Equity is consisted of the issued ordinary share capital plus the share premium and reserves (Panigrahi, Zainuddin & Azizan, 2014). In other words, return on equity is given as:

ROE = Net Income / Outstanding Shares ……. *(1)*

Thus, return on equity indicates the profitability of a bank relative to shareholders' investment.

Theoretical Review

Loanable Funds Theory of Interest

The Loanable Funds theory of interest is otherwise known as the Neo-Classical theory of interest. It is a reformulation of the classical saving and investment theory of interest rate. It incorporates monetary factors with the non-monetary factors of saving investments (Nwandu, 2015). This theory is associated with the names of Wickells, and several other Swedish economists and the British economists, D. H. Robertson (Afolabi, 2019). This theory is an improvement over the old classical theory of interest. According to Ramzakin and Quansey (2018), the Loanable Funds theory of interest rate is determined by the demand for and supply of loanable funds. Classical theory of interest considered only saving out of current income in the supply of saving while neo-classical economists considered not only saving but also bank credit, dishoarding and disinvestment (Moore, 2018). In classical theory, only saving was available for investment while in loanable funds theory of interest of neo-classical economists not only savings, but also hoarded wealth, bank loans, disinvestment wealth are another sources of funds available for investment to the borrowers

(Afolai, 2019). Since loanable funds theory of interest considered both savings of classical theory of interest and bank loans, dishoarding, and disinvestment; it is often referred as real as well as monetary theory of interest. Thus, it is both real and monetary theory of interest.

Shareholders Theory

According to Makinde (2016), the idea of the stakeholder theory was first proposed by Milton Friedman in the year 1970. It emphasizes the importance of putting the interests of shareholders first and discusses the proper way for corporate executives to conduct themselves in their respective business environments (Makinde, 2016). The theory of shareholders proposes that managers have a primary obligation to maximize shareholders' interests in a manner that is still authorized by law or societal standards. This is the core tenet of the shareholders' theory. According to this view, the goal of the company is to increase the wealth of its shareholders as much as possible; to put it another way, the only reason a company exists is to satisfy the requirements and aims of its proprietors. According to this idea, the success of a company is evaluated based only on its current market value, often known as the value it provides to its shareholders. According to Moore (2018), the overall objective of any and all corporate entities should be the maximization of shareholders' value. A strategy that aims to maximize the wealth of shareholders guarantees that shareholders are suitably paid for the risks that are incurred. The dividends paid to shareholders are an essential part of their wealth, but it also includes the capital gain of their assets.

Bank-Led Theory

According to Osho and Akinola (2018), the bank-led model offers an offbeat alternative to traditional branch-based banking whereby customer's financial transactions are done by a whole range of retail agents instead of at bank branches or via bank employees. Retail agents have one-on-one interaction with customers and perform cash-in/cash-out functions much as a branch-based teller would take deposits and process withdrawals. Virtually any outlet that handles cash and is located near customers could potentially serve as a retail agent. Thus**,** Kazi (2022) submitted that in the banking sector, deposit mobilization is a scheme designed to spur customers to deposit more cash with the bank which, in turn, will be used by the bank to give out more loans and generate additional revenue for them. The primary business that banks do is accepting deposits and granting credits. The more the credits the banks give out, the more the revenue they generate. Banks do not have a lot of their own money to give as loans and quite clearly depend on customers' deposits to create funds for granting loans to other customers (Joslin, Singleton & Zhu, 2021).

Theoretical Framework

The adopted theory for this study is the bank-led theory which has a link between deposit rate, lending rate and the profitability of deposit money banks. Giving that deposit money banks do not print money, they rely solely on deposits from customers as their stock in trade. What they do in essence is to offer customers competitive deposit rates that will lead to higher mobilization of funds and these funds are given to those in the deficit unit of the economy that have need for them to aid their investment needs. Expectedly, the lending rate charged by Deposit Money Banks far outweighs the deposit rate they are willing to offer to customers for parting with their funds in either savings, fixed, current or foreign currency accounts. The difference between both rates as such constitutes a profit to the banks. In Nigeria, where interest rates are partially deregulated, and with the stiff-neck competition the banking industry is associated with, the ability of a bank to properly negotiate both

rates goes a long way in determining her return on equity (ROE).

Empirical Review

Ogoke and Amadi (2024) examined the effect of interest rates on the profitability of quoted Deposit Money Banks in Nigeria using panel data spanning 2014 – 2023 with emphasis on the effect of various components of interest rates (prime lending rate, maximum lending rate, 3-months money market rate, 6-months money market rate and 12-months money market rate) on the return on equity and earnings per share of Deposit Money Banks. Multiple regression analytical technique aided by Econometrics view statistical package was used for data analysis. Result revealed that 48 percent of the variation in return on equity of the quoted banks was explained by variation in interest rate components while interest rates accounts for 78.3 percent variation in earnings per share of the quoted Deposit Money Banks in Nigeria. However, maximum lending rate has negative and insignificant effects on ROE and the EPS of quoted banks; prime lending rate and 6-months money market rate have positive effects on EPS and ROE of these quoted banks; while 12-months and 3-months rates have negatively affected earnings per share and ROE of these quoted DMBs in the country.

Dondi, Mule and Ombok (2024) in an aggregated study, considered the influence of lending interest rates on the financial performance of commercial banks in Kenya between 2015 and 2021. They employed a moderated multiple regression methodology whereby secondary balanced panel data encompassing 27 mortgage-offering commercial banks and 189 data points were scrutinized. The results of the regression analysis divulged that the autonomous variables explicated a substantial 86.69% variance in the financial performance of these Kenyan commercial banks. Notably, the coefficient of lending rate manifested as -0.158824, underlining a statistically significant ($p = 0.0020$) association. The study inferred that lending interest rates exert a substantial and adverse impact on the financial performance of commercial banks.

Kanwal and Nadeem (2023) investigated the impact of macroeconomic variables on profitability of public limited commercial banks in Pakistan for the years 2001- 2011. Pooled Ordinary Least Square (POLS) method was used to examine the effect of 3 major external factors (inflation rate, real gross domestic product (GDP), and real interest rate) on return on assets (ROA), return on equity (ROE), and equity multiplier (EM) ratios. The empirical findings indicated a strong positive relationship of real interest rate with return on assets, return on equity and equity multiplier ratios. Secondly, real GDP was found to have an insignificant positive effect on return on assets, but an insignificant negative impact on return on equity and equity multiplier ratios. Inflation rate on the other hand, showed a negative link with all three profitability measures (return on assets, return on equity and equity multiplier ratios). Overall, the selected macroeconomic factors (inflation rate, real gross domestic product and real interest rate) were found to have a negligible impact on earnings of commercial banks.

Ariwa and Uremadu (2023) investigated the relationship between interest rate spread (IRS) and performance of deposit money banks in Nigeria for the period 2007 to 2020. They adopted the ex-post facto research design, and relied on secondary sources of data collected from bulletins of the Nigerian Exchange Group, the Securities and Exchange Commission (SEC), and Central Bank of Nigeria (CBN) for the period 2007 to 2020. Multiple regression analysis was used to determine the effects of IRS on proxies of performance of DMBs (return on assets, return on equity, and profit after tax). Panel data were used

for the study and these data were analyzed using panel data (fixed effect) regression technique which warranted the test of hypotheses using t-test statistic. Findings showed that interest rate spread has a significant effect on return on equity and profit after tax of Deposit Money Banks; while it has no significant effect on return on assets banks in Nigeria.

Umoru, Imimole and Abere (2023) in a similar study investigated the effects of interest rate volatility and changes in money supply policy on the financial sector of selected African countries. The dynamic panel model and GARCH model were used for estimation. A sample of ten countries in the African Union was used for analysis. In terms of policy findings, the results revealed that interest rate volatility and money supply were stationary, and co-integrated with long-run equilibrium relationships among African Union member countries within the study periods. It was also revealed that interest rate volatility negatively impacts the financial sector stability in African Union countries.

Gul (2020) studied the relationship between bank-specific and macro-economic characteristics over bank profitability for the period of 2005 - 2019. Pooled Ordinary Least Square (POLS) method was used to examine the effects.. The results showed that the value for R-square is 0.54, which shows that 54% of variation in the dependent variable (return on asset) is explained by the independent variables (GDP, inflation, market capitalization, size, capital, loan and deposits). Overall results found that these bank-specific and macro-economic factors affect the profitability of banks in Pakistan.

Olalere and Sobhani (2019) examined the effects of liquidity and interest rate risks on the profitability and value of Nigerian banks between 2009 and 2017 by using a sample of sixteen Deposit Money Banks in Nigeria. The study employed a panel estimation technique and given the number of banks used, a total of 144 observations were used for the study. Findings from the study revealed that liquidity risk (loan to deposit ratio and liquid asset ratio) have a significant negative effect on firm value; net interest margin and gross domestic product (GDP) have negative significant effects on firm value for Nigerian banks. Loan to deposit ratio has a negative significant effect on firm value while liquid asset ratio has a positive effect on firm value.

Baba and Ashogbon (2019) examined the effect of interest rate on the financial performance of commercial banks in Nigeria over the period 2006 - 2015. They used panel data regression approach to establish the relationship between the dependent variable (return on equity) and independent variable (interest rate). Thus, the Ordinary Least Square (OLS) analytical technique was employed for data analysis and findings indicated that real interest rate is negatively and significantly associated with the performance of commercial banks in Nigeria.

Ahmed, Rehan, Chhapra and Supro (2018) evaluated the impact of interest rate fluctuations on the profitability of banks of selected banks in Pakistan using annual data of seven years from 2007 to 2014. These selected banks were twenty in number. The sampled banks were taken on the basis of their largest market share and returns. The study used Pearson product moment correlation and OLS regression analytical techniques. The data analyzed were on interest rate changes, deposits with other banks, advances and loans, and investment, return on assets, return on equity and earnings per share. Basically, results showed that deposits with other banks and interest rate have negative effects on the profitability of banks, while advances and loans and investment have direct effects on the profitability of banks in Pakistan.

In a quite related study, Musah, Anokye and Gakpetor (2018) investigated

how the difference in interest rates affects the profitability of commercial banks in Ghana. The study determined interest rate spread through the use of net interest income and net interest margin (NIM), as well as the profitability of the banks through the utilization of return on assets (ROA) and return on equity (ROE). The research analyzed panel data from a sample of twenty-four different financial institutions over the course of 10 years. The findings of the study indicated that there is a positive and significant correlation between interest rate spread and the profitability of banks in Ghana.

Afza, Raja, Imran and Saima (2018) investigated the relationship between interest rate and financial performance of commercial banks in Pakistan. They employed Pearson Product Moment correlation and multiple regression analytical techniques. The variables of interest were interest rate changes, deposits with other banks, advances and loans, and investment as independent variables; while return on assets, return on equity and earnings per share served as dependent variables. The results showed that deposits with other banks and interest rates have negatively affected the profitability of banks, while advances and loans, and investment have positively influenced the profitability of banks in Pakistan.

Alhassan, Anokye and Gakpetor (2018) dwelt on the effect of interest rate spread on the profitability of commercial banks in Ghana. The study was based on a sample of 24 banks over a ten - year period using panel data on interest rate spread, net interest margin, return on assets and return on equity. The Autoregressive Distributed Lag (ARDL) technique was adopted for data analysis and results revealed amongst other things that there is a positive and statistically significant association between interest rate spread and bank profitability in Ghana.

Gap in Literature

The literature today is awash with studies on the nexus between interest rate and capital market performance but none of these studies focused specifically on interest rate and return on equity as a topic. Again, none of the reviewed studies considered treasury bills rate as a component of interest rate. Finally, this study stands out as one of the first that was carried out in 2026 with respect interest rate and ROE of Deposit Money Banks in Nigeria.

Methodology

The design adopted in this study is the quasi-experimental research design. This is because the concern of this study was to determine the cause-effect relationship between interest rates and return on equity of Deposit Money Banks in Nigeria. Also, the data used for such were not subject to manipulation (Okonkwo, 2023).

This study used only secondary data, which were on bank deposit rate, bank lending rate, monetary policy rate, treasury bills rate and return on equity of Deposit Money Banks. Data on bank deposit rate, bank lending rate, monetary policy rate, treasury bills rate were sourced from Central Bank of Nigeria (CBN) statistical bulletin, 2023 edition while data on return on equity was collected from the World Bank.

Following descriptive analysis and Augmented Dickey Fuller (ADF) unit root test, the study adopted the Autoregressive Distributed Lag (ARDL) model developed by Pesaran and Shin (1999) in analyzing the long-term impacts of explanatory variables on a dependent variable was adopted in this work. One of the reasons for utilizing the ARDL model among others is based on its robustness for estimating models with small and relatively large observations. More importantly, the ARDL is applied not withstanding whether the variables are integrated of the same order or fractionally integrated. Thus, the variables under investigation could be I(0), I(1) or a combination of I(0) and I(1) variables.

Again, by allowing for the inclusion of the lagged variables including the lag value of the response variable as independent variable, the ARDL is adjudged to provide opportunity for overcoming the problem of endogeneity often associated with time series data. This further covered cointegration test where the Bounds test approach to co-integration was adopted to examine if long run relationship exists among the underlying variables. In this procedure, the null hypothesis of no co-integration was tested against the alternative hypothesis of co-integration with the application of Wald test or F-test (Pesaran, Shin & Smith, 2001).

Model Specification

The relationship between interest rates and return on equity of Deposit Money Banks in Nigeria was depicted using a multiple regression model. This model is functionally given as:

ROE = f(BDER, BLER, MOPR, TRBR) ……. (2)

Where:

ROE	=	Return on Equity of Deposit Money Banks
BDER	=	Bank Deposit Rate
BLER	=	Bank Lending Rate
MOPR	=	Monetary Policy Rate
TRBR	=	Treasury Bills Rate

The above functional model can further be expressed as:

$ROE = \beta_0 + \beta_1 BDER + \beta_2 BLER + \beta_3 MOPR + \beta_4 TRBR + \mu$ ……. (3)

Where:

β_0	=	Intercept term
β_1	=	Slope of BDER
β_2	=	Slope of BLER
β_3	=	Slope of MOPR
β_4	=	Slope of TRBR
μ	=	Error term

A priori Expectations: $\beta_1, \beta_4 < 0$; $\beta_2, \beta_3 > 0$

4. RESULTS & INTERPRETATION

4.1 Descriptive Analysis

	ROE	BDER	BLER	MOPR	TRBR
Mean	19.29941	5.915000	24.71206	13.88971	14.05265
Median	18.44500	4.090000	23.55500	13.50000	14.38000
Maximum	43.11000	18.80000	36.09000	26.00000	26.90000
Minimum	0.640000	1.410000	18.36000	6.000000	6.130000
Std. Dev.	7.540850	4.836493	4.354659	3.849533	4.520981
Skewness	0.557200	1.456669	0.494035	0.653449	0.316355
Kurtosis	5.036560	3.715877	2.542304	4.739458	3.461326
Jarque-Bera	7.635074	12.75003	1.679837	6.706071	0.868622
Probability	0.021982	0.001704	0.431746	0.034978	0.647711
Sum	656.1800	201.1100	840.2100	472.2500	477.7900
Sum Sq. Dev.	1876.526	771.9249	625.7808	489.0239	674.4959
Observations	35	35	35	35	35

Source: E-Views 10 Output (2026)

From the descriptive analysis carried out, it was revealed that ROE has a mean value of about 19.3% and runs from 0.64% to 43.11% with a standard deviation of 7.54%. Similarly, the mean of BDER, BLER, MOPR and TRBR are 5.91%, 24.71%, 13.89% and 14.05; with standard deviations of 4.84%, 4.35%, 3.85% and 4.52%. The table of descriptive analysis equally shows that all the variables are positively skewed. Also, it shows that except for the variable BLER, the other variables have kurtosis values that are greater than 3, which indicates leptokurtic distribution. However, only the variables BLER and TRBR have normal distribution are the probability values of their respective Jarque-Bera statistic are greater than 5% (0.05).

Unit Root Test

Variables	ADF Statistic	5% Critical Value	P – Value	Level of Integration
ROE	-3.753276	-2.954021	0.0077	I(0)
BDER	-3.134761	-2.954021	0.0336	I(0)
BLER	-3.392395	-2.954021	0.0185	I(0)
MOPR	-7.798450	-2.957110	0.0000	I(1)
TRBR	-3.272332	-2.954021	0.0245	I(0)

Source: Extract from E-Views 10 Output (2026)

Using Augmented Dickey Fuller (ADF) unit root test technique, result shows no presence of a unit in the data set in the table above. This implies that the data set is stationary and can guarantee no spurious estimates and results. Thus the variables ROE, BDER, BLER and TRBR were stationary at level while the variable MOPR was stationary at first difference.

ARDL Short Run Analysis

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
ROE(-1)	-1.086373	0.228427	-4.755877	0.0051
ROE(-2)	-0.227456	0.221652	-1.026186	0.3519
ROE(-3)	-0.207455	0.202156	-1.026210	0.3519
ROE(-4)	-0.728981	0.193152	-3.774126	0.0130
BDER	-4.746571	1.426114	-3.328324	0.0208
BDER(-1)	2.787974	1.199469	2.324341	0.0677
BDER(-2)	2.824591	0.809252	3.490372	0.0175
BDER(-3)	1.057175	1.026061	1.030324	0.3501
BDER(-4)	-2.255793	0.778608	-2.897212	0.0339
BLER	0.131315	0.450712	0.291350	0.7825
BLER(-1)	-0.202275	0.399118	-0.506804	0.6338
BLER(-2)	-2.323207	0.408070	-5.693159	0.0023
BLER(-3)	0.367396	0.311573	1.179163	0.2914
BLER(-4)	-0.732225	0.340610	-2.149748	0.0843
MOPR	4.041188	0.536034	7.539045	0.0007
MOPR(-1)	2.403482	0.512307	4.691491	0.0054
MOPR(-2)	0.881810	0.747105	1.180302	0.2910
MOPR(-3)	1.881672	0.787889	2.388244	0.0625
MOPR(-4)	-0.611061	0.779929	-0.783483	0.4688
TRBR	-1.296342	0.427804	-3.030223	0.0291
TRBR(-1)	-0.739999	0.452318	-1.636017	0.1628
TRBR(-2)	0.850531	0.457438	1.859336	0.1221
TRBR(-3)	-0.890927	0.380656	-2.340506	0.0663
TRBR(-4)	-0.431992	0.507035	-0.851997	0.4331
C	50.84663	9.318727	5.456392	0.0028

R-squared	0.970138	Mean dependent var	19.00600
Adjusted R-squared	0.826802	S.D. dependent var	7.986136
S.E. of regression	3.323594	Akaike info criterion	5.114878
Sum squared resid	55.23139	Schwarz criterion	6.282542
Log likelihood	-51.72317	Hannan-Quinn criter.	5.488424
F-statistic	6.768273	Durbin-Watson stat	2.622308
Prob(F-statistic)	0.021210		

Source: E-Views 10 Output (2026)

From the result of short run analysis carried out as reported in table 4.3, it was reported that lagged ROE (-1), bank deposits and treasury bills rate have negative effects on current year return on equity while bank lending rate and monetary policy rate have positive effects on current period ROE. The table further revealed that in the short run, lagged ROE, bank deposit rate, monetary policy rate and treasury bills rate have significant effects on current year ROE while only the effect of bank lending rate was insignificant.

Bounds Cointegration Test

F-Bounds Test — Null Hypothesis: No levels relationship

Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	13.04275	10%	2.2	3.09
K	4	5%	2.56	3.49
		2.5%	2.88	3.87
		1%	3.29	4.37
			Finite Sample: n=30	
Actual Sample Size	30			
		10%	2.525	3.56
		5%	3.058	4.223
		1%	4.28	5.84

Source: E-Views 10 Output (2026)

Table 4.4 revealed that there is a long run equilibrium relationship between interest rates and return on equity of Deposit Money Banks in Nigeria. This is because the value of F-statistic (13.04275) is greater than the 5% upper limit value of 2.56.

ECM Estimation

ECM Regression
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(ROE(-1))	1.163893	0.181771	6.403079	0.0014
D(ROE(-2))	0.936436	0.160265	5.843065	0.0021
D(ROE(-3))	0.728981	0.115025	6.337569	0.0014
D(BDER)	-4.746571	0.651109	-7.289984	0.0008
D(BDER(-1))	-1.625973	0.334555	-4.860107	0.0046
D(BDER(-2))	1.198618	0.379305	3.160035	0.0251
D(BDER(-3))	2.255793	0.450121	5.011527	0.0041

D(BLER)	0.131315	0.229318	0.572632	0.5917
D(BLER(-1))	2.688036	0.334638	8.032674	0.0005
D(BLER(-2))	0.364829	0.232147	1.571546	0.1769
D(BLER(-3))	0.732225	0.200187	3.657710	0.0146
D(MOPR)	4.041188	0.329375	12.26925	0.0001
D(MOPR(-1))	-2.152421	0.472292	-4.557393	0.0061
D(MOPR(-2))	-1.270611	0.465699	-2.728395	0.0414
D(MOPR(-3))	0.611061	0.401324	1.522611	0.1884
D(TRBR)	-1.296342	0.227124	-5.707633	0.0023
D(TRBR(-1))	0.472388	0.256995	1.838123	0.1255
D(TRBR(-2))	1.322919	0.239980	5.512616	0.0027
D(TRBR(-3))	0.431992	0.249243	1.733217	0.1436
CointEq(-1)*	-0.750265	0.259803	-12.51052	0.0001

R-squared	0.976459	Mean dependent var	-0.216667
Adjusted R-squared	0.931732	S.D. dependent var	8.994642
S.E. of regression	2.350136	Akaike info criterion	4.781544
Sum squared resid	55.23139	Schwarz criterion	5.715676
Log likelihood	-51.72317	Hannan-Quinn criter.	5.080381
Durbin-Watson stat	2.622308		

* p-value incompatible with t-Bounds distribution.

Source: E-Views 10 Output (2026)

From the ECM results as reported in the above table, it follows that in the long run, lagged ROE, bank lending rate and monetary policy rate have positive influences on current year ROE while bank deposit rate and treasury bills rate have negative influences on ROE in the current period. However, only the effect of bank lending rate was statistically insignificant. The table also shows that the coefficient of the cointegrating equation has the desired negative sign (-0.750265) with a significant probability value (0.0001) which indicates that in an event of any distortion to the established long run equilibrium relationship between the variables, the speed at which equilibrium can be re-established by interest rates is about 75.03% within a year.

Diagnostic/Post Estimation Test

Test	Criterion	F-Statistic	P-value
Normality	Jarque-Bera	0.333268	0.846509
Serial Correlation	Breusch-Godfrey LM Test	3.736255	0.1533
Heteroscedasticity	Breusch-Pagan-Godfrey	1.137622	0.4900
RESET	Ramsey	0.000464	0.9838

Source: Extract from E-Views 10 Output (2026)

The first post estimation tests revealed that the errors of the model are normally distributed as the probability value of Jarque-Bera statistic (0.846509) is greater than 5% (0.05). In essence, the errors of the model as expected are normally distributed. The second revealed absence of serial correlation in the errors because the probability value of F-statistic (0.1533) is greater than 5% (0.05). This implies that the errors of the model are not correlated. In other words, the error for one observation does not affect that of another observation. The next showed that there is no presence of heteroscedasticity in the model as the probability value of F-statistic (0.4900) is once again greater than 0.05. This suggests that the variances of the errors have constant variance- they are homoscedastic. Finally, Ramsey RESET test suggests that the model

used for the study was properly specified as the probability vale of F-statistic (0.9838) is again greater than the level of significance, which is 5% (0.05). Hence, the model is adequate and reliable.

Discussion of Findings

Given the specific objectives of the study, four major findings will be reported here. First, bank lending rate has a positive insignificant effect on return on equity of Deposit Money Banks' in Nigeria. This outcome was expected because all things being equal, an increase in the lending rate of banks is expected to increase the income of banks which should also increase the returns shareholders are entitled to at the end of the day (Ekle, 2021; Doffou, 2023). This so given that interest from loans and advances are the major source of income for banks and in an event where the lending rate goes up, the income of banks will also go bank provided other variables are held constant. However, the effect was insignificant and the possible reason is that most banks in Nigeria rely on prime lending rates while lending and this rate is far lesser that the normal lending rate. Another possible reason is the high rate of default on the part of customers who end up not paying up the loans and interest they collect from banks. This singular act reduces the income of banks significant and this affects the returns shareholders are entitled to from these banks (Obagunwa & Akinwale, 2018).

Second, the effect of bank deposit rate on Deposit Money Banks' return on equity in Nigeria is both negative and significant. This study also anticipated that bank deposit rate will have an inverse effect on shareholders' returns because an increase in deposit rates will reduce the spread between lending and deposit rates and this automatically reduces the income of banks which should have a negative bearing on the ROE of the banks (Onigah, 2024; Ariwa & Uremadu, 2023). This is under the assumption that banks will not instantly increase their lending rate for the fear of losing their customers to rivals as there is serious competition for customer funds within the banking industry and outside the banking industry.

Third, treasury bills rate has a negative but significant influence on the return on equity of Nigerian Deposit Money Banks. This connotes that an increase in the rate at which the Nigerian government is willing to borrow from the public on short term basis; the lesser will be the ROE of Deposit Money Banks in Nigeria. This outcome as equally anticipated mainly when the rate offered by the government exceeds the rate banks are offering. The natural tendency is for depositors to channel their funds the treasury bills market which will reduce banks' loanable funds and the income of banks and this will ultimately affect the returns of shareholders (ROE) adversely (Shukrani, 2020). The only remedy here is for these banks to offer something higher or closer to the prevailing treasury bills rate.

Finally, the influence of monetary policy rate on return on equity of Deposit Money Banks' in Nigeria is positive and significant. Thus, if the Central Bank of Nigeria (CBN) should increase her monetary policy rate, banks will be forced to increase their lending rate which will guarantee increment in income and the returns of shareholders (Anokye & Gakpetor, 2018; Ahmed, Rehan, Chhapra & Supro, 2018). Put differently, considering that monetary policy rate is the mother of all rates, if this rate is increased by the monetary authorities, the natural tendency is for Deposit Money Banks to jack-up lending rate which ordinarily should increase their inflow and increase in banks' inflows should enhance the earning of shareholders.

Conclusion and Recommendations

This study revealed that in the short run, bank lending rate and monetary policy rate have direct effects on ROE while bank deposit rate and treasury bills rate have

inverse effects on ROE of banks. However, only the effect of monetary policy rate was insignificant. Hence, the study concluded that interest rate has significant effects on return on equity of Deposit Money Banks in Nigeria. Given the outcome of the study, the following recommendations were put forward;

1. There is need for Deposit Money Banks to offer competitive and improved deposit rates that will attract more deposits from their customers.
2. Deposit Money Banks should do well to reconsider their high lending rates so as to arrest the high incidence of loan default in the system and to increase the return shareholders are entitled to.
3. The monetary authority in Nigeria should not allow Deposit Money Banks to keep excess reserves in order for prevailing monetary policy rates to be able to meet the goals they were made to meet.
4. There is need for another wave on interest rate deregulation so that lending and deposit rates can truly reflect the demand and supply of funds in the Nigerian banking system.

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