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INTEREST RATES AND NET INTEREST MARGIN OF NIGERIAN BANKS (1990 - 2024)

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ABSTRACT

The study examined the effects of interest rates on the net interest margin of Deposit Money Banks in Nigeria for the period 1990 - 2024. Interest rate was considered in terms of bank deposit rate, bank lending rate, treasury bills rate and monetary policy rate. The study as such adopted a quasi-experimental research design whereby secondary data were relied upon. These data which were yearly time series data on the aforementioned variables were collected from the statistical bulletin of the CBN (Central Bank of Nigeria) and the World Bank. The data set obtained was subjected to descriptive analysis, ADF unit root test, and Autoregressive Distributed Lag (ARDL) short run analysis, bounds cointegration test and Error Correction Mechanism (ECM) estimation. Short run analysis revealed that lagged net interest margin (NIM), bank deposit and lending rates have negative effects on NIM while treasury bills and monetary policy rates have positive influences on NIM as only the effects of bank lending, deposit and monetary policy rates were significant. EMC estimation revealed that these interest rates have long run equilibrium relationships with the NIM of banks in Nigeria. The study therefore concluded that interest rates have significant effects on the net interest margin of Deposit Money Banks in Nigeria. Hence, the study suggested that Deposit Money Banks should be encouraged to offer better and competitive deposit rates that will help them attract more funds into the banking system; and these banks should at the same time strive to ensure that their lending rates are reasonable in order

to boost their net interest margins. Thus, the gap between prime and maximum lending rates should be narrowed significantly.

Keywords: Interest rates, Net interest margin, Nigerian banks

Introduction

The Nigerian financial system is carefully regulated and supervised by the Central Bank of Nigeria via policies, reforms and directives. These policies, reforms and directives manifest via interest rate manipulation. The major interest rates manipulated are lending rates, deposit rates, monetary policy rates and treasury bills. These rates are carefully monitored and controlled in order to checkmate the activities of deposit money banks. The operational activities of these banks are regulated because they rely on deposit, lending, monetary policy, and treasury bills rates for survival. According to Ugwuanyi (2022), Deposit Money Banks are unique institutions whose stock in trade is money but they neither print nor mint money. As profit oriented institutions, these banks rely on deposits from customers for onward lending to other customers (investors) for their survival. These banks, do not lend all their deposits, they as well invest some of these deposits in profitable short-term financial assets like treasury bills and the likes for good returns. However, lending and deposit rates of banks align with the prevailing monetary policy rate of the apex bank from time to time.

The genesis of banking business is deposit acceptance. These banks attract funds and make profitable use of such funds. These funds are attracted by way of accepting deposits from customers who do not have immediate need for such funds at a cost (interest rate) to the bank. These same funds are given to borrowers that have pressing needs for these funds at a higher cost (interest rate) to these borrowers, thereby intermediating between the deficit and surplus units of an economy. The difference between lending and deposit rates constitute a profit to the banks and at the end of the day a significant return is made from intermediating between the deficit and surplus units of the economy. Put differently, the spread between what banks offer customers as rewards for parting with their monies and the cost of borrowing these monies from the bank translates significantly to the huge profit banks report yearly in (Ezenwankwo, Yemisi & Adedeji, 2021). But to stand on the side of caution, these banks monitor prevailing monitory policy rate as it is the rate at which the apex bank will be willing to lend to Deposit Money Banks. There is a perceived direct relationship between both rates because banks can not lend below the rate at which they can borrow. A higher monetary policy rate means a higher lending rate and vice versa. However, deposit rate naturally responds to treasury bills rate because depositors of funds are always on the lookout for higher return on their funds. If the treasury bills market offer rates beyond what banks can pay for deposits, funds will move the banking system to the treasury bills market and vice versa. These intricacies are a demonstration on how the apex bank controls the operations of deposit money banks and this affects the financial performance and returns of banks.

The performance of a Deposit Money Banks can be gauged using different financial performance matrices like return on equity, return on asset, return on investment, return on capital employed and net interest margin (Ogoke & Amadi, 2024). Net interest margin is the difference between interest income and interest expenses, usually expressed as a percentage of average earning assets. The interest income refers to inflows from all advances like overdrafts, term loans, medium term loans and long term loans; while interest expenses refers to outflows from all deposits received from customers. Ajibola (2017) added that the former

entails all interest earned from loans and advances (credit) advanced by banks to customers in the course of their daily operations while the latter relates to all interest paid to customers for the singular reason of parting away with their liquidity (money).

Thus, the banking environment is very dynamic and sensitive. This is down to the nature of banking that has confidence and trust as its cornerstones. In equal measure, there are other factors that affect the operation of banks and one of them is interest rate which reflects in lending, deposit, treasury bills and monetary policy rates. The mother of all rates, monetary policy rate, affects other rates and banks closely monitor this rate for survival. Put differently, monetary policy rate, amongst other things, affects the lending, deposit rates and other interest rates of an economy, as monetary policy variation leads to interest rates volatility. This ultimately affects the profitability level of banks as expected (Maigua & Mouni, 2016). However, studies on the cause-effect relationship between interest rate and on the financial performance of Deposit Money Banks are not lacking in the literature but the use of net interest margin as a measure of financial performance is scarce (Olasehinde-Williams, Omotosho & Bekun, 2024; Ogoke & Amadi, 2024; Ariwa & Uremadu, 2023; Umoru, Imimole & Abere, 2023; Ali-Momoh & Fajuyagbe, 2022; Rathnayake, Bai, Louembé & Qi, 2022; Ogundipe, Akintola and Olaoye, 2020; Shukrani, 2020; Baba & Ashogbon, 2019; Chepkorir, Ondiek & Tibbs, 2018; Kihara & Mirie, 2017). Again, these studies have produced contrasting results stating that the effects of interest rates on the financial performance of banks are positive, negative, significant and insignificant. Hence, the question on the horizon is: what is the actual effect of interest rates (deposit, lending, treasury bills and monetary policy rates) on the net interest margin of Deposit Money Banks in Nigeria?

REVIEW OF RELATED LITERATURE

Conceptual Review

Interest Rates

Interest rate is generally seen as the reward for parting with liquidity for a specified period of time. It can also be seen as a measure of the unwillingness of those who possess money to part with their liquid control it. Put differently, interest rate is the money paid or charged percent of the deposit or loan granted by bank or other financial institutions. It also refers to the price for the use of an asset over a period of time, usually monthly, quarterly or annually depending on the period (tenor) (Dhungana, 2016). Interest rate can be short term or long term. Short term interest is usually charged on loans that have tenor of less than a year. The interest charged is not very high when compared to long term loans, because it is less risky. While a long term interest rate is usually paid on deposit and investments that have tenor of long periods mostly over a year. The interest charged on this type of loan is usually higher due to its long term nature which makes it risky. Interest rate can also be real or nominal. A real interest rate is an interest rate adjusted for inflation. It measures the increase in the purchasing power (wealth) and not just financial terms. Whereas a nominal interest rate is the real interest rate inclusive of inflation rate and they are not determined by nominal variables like inflation and money supply rather by the demand and supply of loanable funds. Therefore, if there is inflation, the real interest rate does not change but the nominal interest rate changes to ensure the increase in purchasing power remains constant despite the high inflation (Ogunbiyi & Ihejirika, 2014).

Bank Deposit Rate

The interest rate a bank or financial institution pays on cash deposits is termed as 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. 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, 2018). 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, 2022).

According to Ngari (2023), monetary policy rate or base rate can influence the interest rates offered by Deposit Money Banks on deposit accounts. When the central bank raises its policy rate, banks may increase the rates they offer on deposits, making saving more appealing. The terms and conditions of deposit accounts can vary, including minimum deposit requirements, withdrawal restrictions, and penalties for early withdrawals (common with certificates of deposit, CDs). These can affect the interest rates offered. Banks consider their operational costs when determining deposit rates. These costs include staffing, overhead, and regulatory compliance expenses. Lower-cost digital banks, for example, may offer more competitive deposit rates. In many countries, deposit rates are subject to regulatory oversight to ensure fair and transparent practices. Regulatory bodies may impose caps on deposit interest rates and require banks to disclose terms and conditions to customers (Ekle, 2021).

Bank Lending Rate

Bank lending rate refers to the interest rate at which banks lend to preferred customers with good credit. It is used in many countries by banks. A lending rate is referred to in some countries as a prime rate or a prime lending rate. 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. Maximum lending rates refer to the average of the highest lending rates charged by deposit money banks in Nigeria. 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, 2018). It is also used as a guide in calculating private student loans, credit cards, homes equity lines of credit, etc. Most of these loans have their variable interest rates that are specified as prime rates including a fixed value ordinarily known as a spread or margin.

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, 2018). It is further used as a guide in calculating private student loans, credit cards, homes equity lines of credit, etc. Most of these loans have their variable interest rates that are specified as prime rates including a fixed value ordinarily known as a spread or margin. On the other hand, maximum lending rate refers to the average of the highest lending rates charged by deposit money banks in Nigeria. In other words, the maximum bank lending rate is the interest rate that deposit money banks may legally charge their borrowers for loans they make to their clients. If the highest interest rate that banks are ready to lend at is too high, the banks run the danger of inducing adverse selection difficulties.

This occurs when high risk borrowers are willing to accept the high interest rates. It is possible that Nigerian deposit money banks may discourage long-term investment by charging excessively high interest rates, which would limit the country's capacity for economic expansion (Nande, 2015). A rise in the base rate that the central bank uses to determine other interest rates would lead to an increase in the maximum interest rate that Deposit Money Banks charge their clients when they borrow money. Thus, an increase in maximum lending rate will have an effect on individuals, particularly if the interest rate on any loans they hold is variable. This would result in a decrease in the amount of money that people have available for spending, saving, or investing. People are going to have to pay their bills, and as those costs grow more costly, families are going to have less money available for other expenses (Victor & Eze, 2018).

Treasury Bills (T-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).

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. 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 (Umoru, Imimole & Abere, 2023).

Net Interest Margin

Net interest margin is another traditional measure of bank performance (ECB, 2020). It is best described as the difference between the interest income generated and the amount of interest paid out to lenders over a period of time. Net interest margin in essence is an industry-specific profitability ratio for banks and other financial institutions that lend out interest-earning assets (cash). Put differently, net interest margin is a measure of profitability for banks and financial institutions (Ibikunle & James, 2021). It can also be seen as the difference between interest received (interest revenue) and interest paid (interest expense) over a given period of time. In simpler terms, net interest margin is the net benefit of lending. Interest revenue is generated through interest payments a deposit money bank receives on outstanding loans. It is made up of credit lines and loans on the bank's balance sheet; while interest expense is the price the bank charges the borrower in a financial transaction. It is the cost of borrowing money. It also refers to the interest that accumulates on outstanding liabilities like customer deposits and wholesale financing (Firdous & Farooqi, 2017).

Net interest margin is significantly affected by so many factors like the prevailing interest rate in an economy, profitability, liquidity, capital adequacy ratio, inflation rate, GDP growth, political stability and population growth (Banke & Yitayaw, 2022). A positive net interest margin indicates that a bank's interest revenue exceeds her interest expense and vice versa for a negative net interest margin. In other words, the former indicates that a bank is efficiently investing or making profit, whereas the latter implies a bank is inefficient investing or making a loss (Tuyishime, Memba & Mbera, 2015). It is imperative to add that this metric helps prospective investors determine whether to invest in a bank or not. According to Banke and Yitayaw (2022) net interest margin (NIM) can be determined by subtracting interest expenses from interest revenue and then dividing the amount by the assets earned. Thus,

NIM = Interest Income – Interest Expense / Average Interest-Earning Assets …… (1)

Theoretical Review

Waiting Theory of Interest Rate

The Waiting theory of interest, according to Ogoke and Amadi (2024), is associated with the name of Senior. The theory has it that interest is a reward for abstinence. When a person saves money from his income and lends it to somebody else, he in fact makes sacrifice. Sacrifice in the sense that he abstains from consuming the whole of his income which he could have

easily spent. As abstaining from consumption is disagreeable and painful, so the lender must be rewarded for this. Thus, according to Senior, interest is the reward for abstinence from the use. This theory is rejected on the ground that saving does not necessarily involve discomfort or sacrifice. A millionaire may save and lend a major part of his income without undergoing any hardship or suffering (Ahmed, 2019). Marshall, realizing this flaw in Senior's definition, substituted the term waiting for abstinence. According to Marshall, interest is the reward for waiting. When a man saves a part of his income, he simply postpones his present consumption to some future date. During a period when money is loaned, he himself might stand in need of money. But he cannot get it back from the borrower as the period of loan is fixed. He has to wait for the return of loan. In order to encourage the spirit of waiting amongst the lenders, some inducement is necessary and this inducement according to Marshall is interest (Onchoke, 2017).

Again, the theory is criticized on the ground that it lays undue emphasis on the supply side of the problem and ignores the demand side which is equally important for explaining the economic cause of rent. In addition, it is not true that all the money saved is only due to the inducement of interest. Some persons may save money even if the rate of interest is zero (Ogoke & Amadi, 2024).

The Market Power Theory

According to Baba and Ashogbon (2019), the Market Power theory is mostly applied in banking and it states that the performance of a bank is influenced by the market structure of the industry. According to Firdous and Farooqi (2017), there are two distinct approaches within the theory, namely: the Structure-Conduct-Performance (SCP) and the Relative Market Power hypothesis (RMP). According to the RMP hypothesis, the profitability of commercial banks is influenced by market share. The assumption underlying this hypothesis is that, only large banks with differentiated products can influence prices and increase profits. They are able to exercise market power and earn non-competitive profits. Smaller banks do not have the ability to influence prices and increase profits (Dhungana, 2016). The SCP approach on the other hand, states that the level of concentration in the banking market gives rise to potential market power by banks, which may raise their profitability. Thus, banks in more concentrated markets are most likely to make abnormal profits by their ability to lower deposits rates and to charge higher loan rates as a results of collusive (explicit or tacit) or monopolistic reasons, than firms operating in less concentrated markets, irrespective of their efficiency (Dhungana, 2016). The discussion of the market power theory shows that bank profitability is a function of external market factors.

Stakeholder Theory

The stakeholder theory was first established by Freeman in 1984 as a tool for management, but it has since expanded into a theory of the enterprise that has a significant potential for explaining a variety of phenomena (Baba & Ashogbon, 2019). The theory places an explicit emphasis on the balance of the interests of many stakeholders as the primary factor in determining business policy. The stakeholder theory takes a prospective stance and strives to understand how managers should prioritize and respond to claims made by stakeholders in order to enhance a company's capacity to produce value. This theory employs a forward-looking approach (Ali-Momoh & Fajuyagbe, 2022). According to Donaldson and Preston (2015),

stakeholders are "identified groups or individuals who have a genuine interest in an organization and these interests have inherent worth." Going by this idea, no one interest should be allowed to take precedence over the others since it is concerned with how management decision-making impacts all of the stakeholders.

The management of a company needs to maintain the interests of its customers, suppliers, workers, communities, and shareholders aligned with one another and going in the same direction for the company as a whole to flourish and be sustainable over time. The straightforward tactic of hedging one's bets by hedging the interests of many stakeholders against one another should not be prioritized above the need of constant innovation to maintain this alignment of interests. Therefore, executives will produce the most potential value for shareholders and other financiers if they manage the company with the stakeholders' interests in mind (Osho & Akinola, 2018).

Theoretical Framework

The stakeholder theory is an essential theory when considering the financial performance of corporate entities like Deposit Money Banks (Eregha, 2020). This is because collaboration across the numerous stakeholders of a bank is required for the greatest possible performance of the bank. People who are impacted by the actions of an entity and who also have some kind of control over that entity are considered to be stakeholders. Stakeholders may be affected in a variety of ways. In the context of deposit money institutions, these stakeholders include, but are not limited to, management, shareholders, customers, regulatory agencies, the government, and so on. Every participant is impacted by the government's control of the interest rate policies used by deposit money institutions (Eregha, 2020). It is clear that the regulation of interest rate policies involves and has an effect on all of the participants in the economy who are also stakeholders of Deposit Money institutions.

The effectiveness of deposit money institutions as a whole is influenced in some way by the rules governing interest rates. In light of this, one may deduce that the management of interest rates in Nigeria's deposit money banks, which takes place as a result of the activities of a variety of stakeholders, has an influence on the overall performance of the banks. And in a related manner, the performance of banks has an influence on the many different stakeholders. This can be in the form of lending rates charged to customers for the purpose of obtaining loans and advances; or the high bank rate of borrowing charged by the central bank of Nigeria on deposit money banks in order to limit the amount of borrowing done by those banks; or dividends paid out to shareholders (Dhungana, 2016).

Empirical Review

Onigah (2024) examined the combined effects of interest rates on Deposit Money Banks' performance in Nigeria. Interest rates were represented by monetary policy rates, commercial banks' lending rates, liquidity rates, and deposit rates; while the performance of Deposit Money Banks (DMB) was measured using bank loans and credits. For data analysis and estimation of model parameters, Ordinary Least Squares method of multiple regressions was applied. The study found that there are vary relationships among different types of interest rates and the performance of Deposit Money Banks in Nigeria. The study further showed that monetary policy rate, bank lending rate, banks liquidity rate and bank deposits rates influenced

Deposit Money Banks' credit creation ability vis-a-vis Deposit Money Banks' performance, significantly.

Dondi, Mule and Ombok (2024) studied the influence of lending interest rates on the financial performance of commercial banks in Kenya between 2015 and 2021. The study encompassed the entire commercial banks providing mortgage financing, which are 32 out of the 39 established banks in Kenya, as per the Central Bank of Kenya's 2021 report. Given the nature and scope of the study, 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 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.

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. Interest rate was disaggregated into prime lending rate, maximum lending rate, 3-months money market rate, 6-months money market rate and 12-months money market rate while profitability was measured using return on equity and earnings per share (EPS). Results showed that maximum lending rate have negative and insignificant effects on return on equity and EPS of banks while prime lending rate and 6-months money market rate have positive effects on ROE and EPS. However, return on 12-months and 3-months market rates have negative effects on ROE and EPS of the banks.

Adewunmi (2023) investigated the impact of interest rate movements on the performance of Deposits Money Banks in Nigeria for a meaningful period of 32years (1990 – 2021). Data used for the study were on national savings, deposit rate, minimum lending rate and monetary policy rate; and these data were gathered form Central Bank of Nigeria (CBN) statistical bulletin for 2021. The generated data were analyzed using the Ordinary Least Square (OLS) multiple regression technique. The study revealed that minimum lending rate and deposit rate have significant impacts on total deposit of DMBs while monetary policy rate and national savings have positive significant impacts on total deposit of Deposit Money Bank in Nigeria.

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. Multiple regression analysis was used to determine the effect of IRS on ROE, ROA and PAT. 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 (PAT) of Deposit Money Banks while it has no significant effect on return on assets of these banks in Nigeria.

Olusanya and Odishika (2022) examined the association between interest rate and Deposit Money Banks' lending operations in Nigeria between 1970 and 2020. The Johansen co-integration test, Error Correction Model estimation, and Chow test were utilized for data analysis. Results showed that there is a long-run association between financing cost and business bank credits and advances in Nigeria during the time of investigation. However, Chow

test showed that the invalid speculation is dismissed and this proposes that financing cost affects business banks' advances and propels in Nigeria during controlled and liberated periods.

Ihegboro, Ofoedu, Uzochukwu and Okechi (2022) examined the impact of interest rate on deposit money banks performance in Nigeria for the period 2010 - 2019. Interest rate was proxied by the monetary policy rate while bank performance was proxied by total assets, total liabilities and total deposits of Deposit Money Banks in Nigeria. Ordinary Least Square (OLS) simple regression technique was employed for data analyze. Findings showed that monetary policy rate has a positive and significant impact on total assets and total liabilities of deposit money banks in Nigeria; while monetary policy rate has a negative and insignificant impact to total deposit.

Tahmoorespour and Ardekani (2022) examined the impact of interest rate on bank return and bank size. Data for the study was taken from 14 different markets between the period 2011 and 2020. The study considered different financial ratios as proxies for the interest rate, bank return and bank size. The Ordinary Least Square (OLS) multiple regression tools were used for data analysis and results showed different positive and negative results because of fluctuations of interest rate. This is because of difference in market size, macro-economic conditions, monetary policy and difference among countries. Most countries' banks indicated positive associations with return and interest rate difference. However, countries like India, Japan, Denmark, and Switzerland were not in accordance with it.

Ali-Momoh and Fajuyagbe (2022) examined the association between interest rates and the financial performance of listed deposit money banks in Nigeria. Thus, financial performance was regressed on the growth of domestic money supply, maximum bank lending rate, monetary policy rate, and rate of inflation. Data analysis was carried out using panel data induced OLS technique and results revealed that domestic money supply, maximum lending rate, and monetary policy rate have positive and significant effects on financial performance while inflation rate has a negative and statistically significant effect on financial performance.

Udom, Agboegbulem, Atoi, Adeleke, Abraham, Onumonu and Abubakar (2021) applied panel analysis to determine the factors influencing interest margins in Nigeria using bank-specific, sector-specific, and macroeconomic data ranging from 2010Q1 to 2014Q2. Based on the Hausman test, a fixed effect model in a generalized form (GLS) was estimated. The result showed that credit risk, growth in loans and advances, staff operating cost, GDP growth, inflation rate, and money supply growth are significant determinants of interest margins in Nigeria. Consistent with previous studies, staff cost exerts highest impact on interest margins followed by fixed effects term. Further analysis of the banks' fixed effects reveals that seven banks control about 64%, which raises a policy concern for banks' supervisors. The result also revealed that banks usually transfer their staff operating costs to customers by either imposing exorbitant lending rates or low deposit rates or both.

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. Determinants of banks' profitability were categorized into two types of factors; internal and external factors. The study defined external factors to include: GDP, inflation and market capitalization; while internal factors to include: size, capital, loan and deposits. Return on asset (ROA), return on equity (ROE), return on capital employed (ROCE) and net interest margin (NIM) were used to measure bank

profitability. The results showed that 54% of variation in return on asset is explained by 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.

Gap in Literature

The major novelty of this study is that it considers net interest margin as a surrogate of financial performance in assessing the cause-effect relationship between interest rate and bank performance. This is not a claim that net interest margin has not been used before but in the context of the model adopted for this study, there are few or no of such studies.

METHODOLOGY

The Quasi-experimental research design was adopted in this study. This is because this research design does not only involve a survey of existing data, it also allows for the evaluation of a set of exogenous variables on an endogenous variable (Handell, 2021). In other words, the quasi-experimental research design was adopted because of the need to establish the cause-effect relationship between different variants of interest rate and net interest margin as a performance indicator of Deposits Money Banks in Nigeria.

Data for this study were collected from secondary sources. Bank lending rate, bank deposit rate, monetary policy rate and treasury bills rate were collected from Central Bank of Nigeria (CBN) statistical bulletin, 2024 edition; while data on deposit money banks' net interest margin (NIM) were sourced from the World Bank (World Bank Development Indicator).

The data generated for this study was first subjected to descriptive analysis which was centered on determining the descriptive characteristics of the variables used in the study. These characteristics were mainly the mean, median, maximum and minimum values, kurtosis and skewness of the variables. Next, the data for each variable was exposed to unit root test via the ADF (Augmented Dickey Fuller) approach. This test was executed with the mindset of ensuring that all the variables were stationary so as to avoid coming up with spurious and misleading results. Given the results of unit root test, the data set was subsequently subjected to Autoregressive Distributed Lag (ARDL) analysis. According to Brown (2019), the ARDL is the best in analyzing the long-term impacts of a set of explanatory variables on a dependent variable. He added that this approach is preferable because of its robustness in estimating models with small and relatively large observations. The ARDL technique is also applied not withstanding whether the variables concerned 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 (Granger & Newbold, 2012). In addition, there were bounds test, ECM estimation and diagnostic tests. Diagnostic tests covered heteroscedasticity, normality and Ramsey RESET tests. The whole analytical procedure was aided by E-Views 10 software.

Model Specification

$$NIM = F(BDR, BLR, TBR, MPR) \quad \ldots\ldots (2)$$

$$NIM = a_0 + a_1BDR + a_2BLR + a_3TBR + a_4MPR + \mu \quad \ldots\ldots (3)$$

Where:

NIM = Net Interest Margin
BDR = Bank Deposit Rate

BLR = Bank Lending Rate
TBR = Treasury Bills Rate
MPR = Monetary Policy Rate
a_0 = Intercept Term
a_1 = Regression Coefficient of BDR
a_2 = Regression Coefficient of BLR
a_3 = Regression Coefficient of TBR
a_4 = Regression Coefficient of MPR
μ = Error Term

A Priori Expectations: $a_1, a_4 < 0$; $a_2, a_3 > 0$.

4.0 DATA ANALYSIS AND INTERPRETATION OF RESULTS

4.1 Descriptive Analysis

Table 1: Result of Descriptive Analysis

	NIM	BDR	BLR	TBR	MPR
Mean	7.549118	5.915000	24.71206	14.05265	13.88971
Median	8.055000	4.090000	23.55500	14.38000	13.50000
Maximum	12.12000	18.80000	36.09000	26.90000	26.00000
Minimum	2.240000	1.410000	18.36000	6.130000	6.000000
Std. Dev.	2.580357	4.836493	4.354659	4.520981	3.849533
Skewness	-0.387517	1.456669	0.494035	0.316355	0.653449
Kurtosis	2.431955	3.715877	2.542304	3.461326	4.739458
Jarque-Bera	1.308085	12.75003	1.679837	0.868622	6.706071
Probability	0.519940	0.001704	0.431746	0.647711	0.034978
Sum	256.6700	201.1100	840.2100	477.7900	472.2500
Sum Sq. Dev.	219.7221	771.9249	625.7808	674.4959	489.0239
Observations	35	35	35	35	35

Source: E-Views 10 Output (2026)

Table 1 contains result of descriptive analysis carried out. The table revealed that net interest margin (NIM) has a mean value of about 7.55% and runs from 2.24% to 12.12% with a standard deviation of 2.58%. Similarly, the mean of BDR, BLR, TBR and MPR are 5.92%, 24.71%, 14.05% and 13.89; with standard deviations of 4.84%, 4.35%, 4.52% and 3.85% respectively. The table of descriptive analysis equally shows that but for NIM, all the variables were positively skewed. Also, it shows that the variables BDR, TBR and MPR are peaked (leptokurtic) relative to a normal distribution; while NIM and BLR are flat (platykurtic) relative to a normal distribution. This is because the kurtosis of the normal distribution is 3. However, the variables NIM, BLR and TBR mirror a normal distribution as the probability values of their respective Jarque-Bera statistic are greater than 5% (0.05).

Unit Root Test

Table 2: Result of Unit Root Test

Variables	ADF Statistic	5% Critical Value	P – Value	Level of Integration
NIM	-6.579145	-2.957110	0.0000	I(1)
BDR	-3.134761	-2.954021	0.0336	I(0)

BLR	-3.392395	-2.954021	0.0185	I(0)
TBR	-3.272332	-2.954021	0.0245	I(0)
MPR	-3.110801	-2.954021	0.0354	I(0)

Source: Extract from E-Views 10 Output (2025)

Using Augmented Dickey Fuller (ADF) unit root test technique, result showed no presence of a unit in the data set in table 3. This implies that the data set is stationary and can guarantee no spurious estimates and results. Thus the variables BDR, BLR, TBR and MPR were stationary at level, I(0); while the variable NIM was stationary at first difference, I(1).

ARDL Short Run Analysis

Table 3: Result of Short Run Analysis

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
NIM(-1)	-0.385495	0.214873	-1.794057	0.0980
NIM(-2)	-0.697428	0.233593	-2.985649	0.0114
BDR	-2.264107	0.435655	-5.197024	0.0002
BDR(-1)	1.184837	0.323002	3.668208	0.0032
BDR(-2)	0.399566	0.202376	1.974373	0.0718
BLR	-0.494231	0.131014	-3.772348	0.0027
BLR(-1)	-0.428794	0.147651	-2.904111	0.0132
BLR(-2)	-0.354349	0.150112	-2.360572	0.0360
TBR	0.275311	0.129249	2.130090	0.0545
TBR(-1)	0.623522	0.194814	3.200601	0.0076
TBR(-2)	-0.069530	0.150071	-0.463316	0.6514
TBR(-3)	0.175321	0.117467	1.492520	0.1614
MPR	0.381748	0.144867	2.635170	0.0218
MPR(-1)	0.314918	0.140861	2.235670	0.0451
MPR(-2)	0.646730	0.192178	3.365258	0.0056
MPR(-3)	0.306120	0.191284	1.600341	0.1355
MPR(-4)	-0.729743	0.167017	-4.369283	0.0009
C	23.39018	4.128614	5.665383	0.0001

R-squared	0.904036	Mean dependent var	7.333000
Adjusted R-squared	0.768087	S.D. dependent var	2.676925
S.E. of regression	1.289136	Akaike info criterion	3.629531
Sum squared resid	19.94247	Schwarz criterion	4.470250
Log likelihood	-36.44297	Hannan-Quinn criter.	3.898484
F-statistic	6.649812	Durbin-Watson stat	3.015315
Prob(F-statistic)	0.000942		

*Note: p-values and any subsequent tests do not account for model selection.

Source: E-Views 10 Output (2026)

From the result of short run analysis carried out as reported in table 4, it was revealed that lagged NIM(-1), bank deposit rate and bank lending rate have negative effects on current year net interest margin (NIM) while treasury bills rate and monetary policy rate have positive effects on current period NIM. The table further revealed that in the short run, bank deposit rate, bank lending rate, and monetary policy rate have significant effects on current year NIM

while lagged NIM, and treasury bills rate have insignificant influences on current year net interest margin.

4.4 Bounds Cointegration Test

Table 4: Result of Bounds Test

Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	6.900475	10%	2.2	3.09
k	4	5%	2.56	3.49
		2.5%	2.88	3.87
		1%	3.29	4.37

Source: E-Views 10 Output (2026)

Table 5 revealed that there is a long run equilibrium relationship between interest rates and net interest margin of Deposit Money Banks in Nigeria. This is because the value of F-statistic (6.900475) is greater than the 5% upper limit value of 3.49.

ECM Estimation

Table 5: Result of ECM Estimation

ECM Regression
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(NIM(-1))	0.697428	0.167386	4.166592	0.0013
D(BDR)	-2.264107	0.292823	-7.731993	0.0000
D(BDR(-1))	-0.399566	0.158314	-2.523888	0.0267
D(BLR)	-0.494231	0.081006	-6.101162	0.0001
D(BLR(-1))	0.354349	0.105500	3.358749	0.0057
D(TBR)	0.275311	0.082680	3.329844	0.0060
D(TBR(-1))	-0.105791	0.106609	-0.992328	0.3406
D(TBR(-2))	-0.175321	0.074942	-2.339415	0.0374
D(MPR)	0.381748	0.108610	3.514846	0.0043
D(MPR(-1))	-0.223107	0.127204	-1.753929	0.1049
D(MPR(-2))	0.423623	0.109681	3.862322	0.0023
D(MPR(-3))	0.729743	0.115046	6.343051	0.0000
CointEq(-1)*	-0.682923	0.271972	-7.658592	0.0000

R-squared	0.873874	Mean dependent var	-0.184333
Adjusted R-squared	0.784845	S.D. dependent var	2.335010
S.E. of regression	1.083091	Akaike info criterion	3.296198
Sum squared resid	19.94247	Schwarz criterion	3.903383
Log likelihood	-36.44297	Hannan-Quinn criter.	3.490442
Durbin-Watson stat	3.015315		

* p-value incompatible with t-Bounds distribution.

Source: E-Views 10 Output (2026)

From the ECM results as reported in table 5, it was revealed that in the long run, lagged NIM, treasury bills rate and monetary policy rate have positive influences on current year NIM while bank deposit rate and bank lending rate have negative influences on NIM in the current period. However, all the variables have statistically significant effects on net interest margin.

The table also shows that the coefficient of the cointegrating equation has the desired negative sign (-0.682923) with a significant probability value (0.0000) which indicates that in an event of any shock within a year, the speed with which equilibrium can be restored is about 68.29%.

Diagnostic Test

Table 6: Summary of Diagnostic Test Results

Test	Criterion	F-Statistic	P-value
Heteroscedasticity	Breusch-Pagan-Godfrey	0.901486	0.5881
Normality	Jarque-Bera	0.888401	0.641337
RESET	Ramsey	1.179241	0.3007

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

From the table, since the probability value of Breusch-Pagan-Godfrey heteroskedasticity test statistic (0.5881) is greater 5% (0.05), it implies absence of heteroscedasticity. This means that the variances of the errors of the model are homoscedastic- they are constant as expected. The second diagnostic test revealed that the errors of the model are normally distributed as the probability value of Jarque-Bera statistic (0.641337) is greater than 5% (0.05). In essence, the errors of the model as expected are normally distributed. Finally, with the probability value of F-statistic (0.3007) being greater than 5% (0.05), it follows that the model of the study was well specified.

Discussion of Findings

Given the objectives of the study, four major findings emanated from the study. First, the study revealed that bank deposit rate has a negative but significant effect on the net interest margin of deposit money banks. This implies that an increase in the deposit rate of banks leads to a decrease in the net interest margin of these banks. This outcome was expected because an increase in deposit rate translates to an increase in interest expense which will reduce the margin between lending rate and lending rate provided that lending rate is held constant. However, in practice, banks as profit oriented outfits will always increase lending rate in an event that deposit rate goes up in order to meet the costs of operation, satisfy the varying interest of stakeholders like shareholders, creditors, deficit and surplus units, the immediate business environment and regulators; and to remain in business (Onigah, 2024; Adewunmi, 2023; Ngari, 2023).

Second, bank lending rate also has a negative but significant influence on Deposit Money Banks net interest margin. This outcome runs contrary to the study's a priori expectation as the study expected bank lending rate to have a direct effect or influence on the net interest margin of Deposit Money Banks in Nigeria. Accordingly, given that NIM is a function of lending rate, deposit rate and average of interest earning the assets, it follows that an increase in lending rate, keeping deposit rate and average of interest earning the assets constant, will push net interest margin up (Ariwa & Uremadu, 2024). This unexpected outcome, however, can be attributed to the unwillingness of Nigerian banks to offer competitive lending rates as their rates are relatively outrageous which discourage Nigerians from borrowing from these banks. At the end of the day, borrowers of funds, like corporate entities, consider other alternatives like the capital market.

Third, treasury bills rate has a positive insignificant effect on the net interest margin of banks in Nigeria but ideally, the effect should be negative because on one hand, an increase in treasury bills rate will ordinary push more funds from the banking system to the treasury bills market, which will reduce the loanable funds available to banks and this will ultimately affect the interest income of banks adversely (Ali-Momoh & Fajuyagbe, 2022). On the other hand, the interest expense of banks will also be adversely affected because lesser deposits will come to the banks but given that there is always a margin between lending and deposit rates, the effect will be more on the income of banks from lending activities. Nevertheless, the effect was insignificant and this may be because majority of Nigeria's money supply exist as currency and not deposits. As such, an increase or decrease in treasury bills rate does not necessarily affect the lending or deposit rates of banks which ultimately does not meaningfully affect the net interest margin of these banks (Ogoke & Amadi, 2024; Gul, 2020).

Finally, the effect of monetary policy rate on the net interest margin of deposit money banks is both positive and significant. This outcome was fully anticipated because monetary policy rate is the mother of all interest rates in Nigeria. As such, an increase in monetary policy rate will directly affect lending and deposit rates which will indirectly affect the net interest margin of banks.

Conclusion and Recommendations

Given that bank lending rate, bank deposit rate and monetary policy rate were statistically significant in the short and long runs while only treasury bills rate was insignificant in the short run, the study concluded that interest rates has significant effects on the net interest margin of Deposit Money Banks in Nigeria. Accordingly, the study recommended the following:

1. Deposit Money Banks should be encouraged to offer better and competitive deposit rates that will help them attract more funds into the banking system.
2. These banks should at the same time strive to ensure that their lending rates are reasonable in order to boost their net interest margin. Thus, the gap between prime and maximum lending rates should be narrowed significantly.
3. For monetary policy to further achieve the expected results on the NIM of banks, the big banks should not be allowed to maintain excess reserves. Such a practice makes monetary policies ineffective.
4. There is need for extra publicity on the existence and operation of the treasury bills market in order to attract more funds into the market.

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