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Research Article

Monetary Policy And Financial Development In Nigeria

Salimata Saadu Olumo[1*], Taiwo Adewale Muritala[2]

[1*]Nile University of Nigeria, Salimaolumo@Gmail.Com
[2]Nile University of Nigeria, muritala.adewale@nileuniversity.edu.ng

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ABSTRACT

The financial growth and developmental stride of Nigeria can only be achieved if there is consistency in the monetary policies and thriving of its elements including the interest rate. This study investigated the monetary policies and financial development in Nigeria between 2004 and 2023. The specific objectives include to examine the impact of interest rates on Nigeria's financial depth; to assess the impact of interest rates on Nigeria's financial stability; to evaluate the impact of interest rates on Nigeria's access to finance; and to determine the impact of interest rates on Nigeria's efficiency of the financial system. historical data of yearly from the World Development Indicator (WDI) for the data set of interest rates, that is, Broad Money (in terms of GDP) and Deposit Interest Rate, while, the data for financial stability, depth, access, and efficiency were obtained from the Global Financial Development, which are Bank Z-Score, Domestic credit to the private sector, Bank Branches per 100,000 adults, and Bank net interest margin respectively. Data analysis was done using descriptive statistics and inferential statistics of unit root tests, co- integration test, panel cointegration, estimation of panel cointegration regression while dynamic fixed effect model is applied to get the impact. The conclusion from this study shows that there is a significantly positive impact of BZS on the DIR indicating about 15% impact as reiterated by its 15.9% coefficient value while the DCPGDP, shows an insignificant positive impact on the DIR reinforced by its coefficient value of about 1.2%. For the BBA, it shows a positively low impact on DIR with coefficient of about 4% while the BNIM negatively impact the DIR shown by its coefficient of -24.5%. This study recommended that deepening financial sector growth is necessary to boost the monetary transmission mechanism meaning that it is important to acknowledge the lag in the effects of interest rate modifications on financial stability, hence, requiring a measured approach to assess the efficacy of policy alterations on the nation's overall financial stability.

Keywords: Financial Access, Financial Depth, Financial Stability, Financial System Efficiency, Monetary Policies, Financial Development, Nigeria

INTRODUCTION

The governance of nations globally is predominantly effective and influential, contingent upon the strength of their monetary and fiscal policies. Numerous nations implement these policies to promote or enhance the growth of their citizens across various economic sectors, including the real, financial, external, and fiscal sectors (Chinda, 2024). As a result, the global economic growth indicator, measured by GDP, increased from 2.2% in 1980 to 6.3% in 2022, despite numerous challenges during this period, including the global financial crisis, climate change, regional and sectoral conflicts, pandemics, and political power struggles (Adeyemi, 2024). Significant GDP growth rates, exemplified by China's, are often attained through financial development techniques and monetary policy that stabilize business cycles and promote sustained economic growth. The four-trillion stimulus package implemented by China's counter-cyclical monetary policy in response to the anticipated adverse effects of the 2008 global financial crisis exemplified this approach (Egbetunde & Abayomi, 2024). This propelled their M2 growth rate to 27.7% in 2009, exceeding the 2008 level by ten percentage points (Lu et al., 2020). Conversely, the USA and numerous Western nations frequently implement unconventional monetary policies, such as quantitative easing and negative interest rates, to stimulate growth and enhance GDP. This macroeconomic stabilization strategy seeks to uphold low and stable rates of inflation and unemployment (Obinna & Innocent, 2024). The objective of relaxing financial

constraints is to enhance the balance sheets of banks, corporations, and households, hence facilitating lending and borrowing (Cecchetti et al., 2020). As of 2023, Africa's GDP was estimated at over 3.1 trillion U.S. dollars, the highest value since 2010, when it was around 2.1 trillion U.S. dollars.

Thus, price stability is the primary objective of monetary policy management, whereas stable growth and full employment are interconnected aims, alongside reasonable long-term interest rates and consistent real exchange rates (Ozili & Iorember, 2024). The financial system's role in achieving monetary policy objectives is crucial, as it acts as the interface between the real economy and monetary policy. According to Apanisile & Osinubi (2020), the influence of monetary policy mostly revolves around parameters impacted by the evolution of the financial system, due to the financial system's crucial role in the processes of monetary policy. Consequently, any alteration that influences the conditions or framework of the financial system will theoretically affect the economy's production. Monetary policy serves as a potent instrument for a central bank to attain price stability, economic growth, financial stability, and elevated employment levels (Arshad et al., 2021). This analysis will examine two aspects of how monetary policy influences financial development levels. The policymaker encounters trade-offs between the money supply, liquidity, and reserves. Secondly, the establishment of interest rates, including central bank policy rates, lending rates, and discount rates (IMF), is facilitated by financial intermediaries such as the banking sector inside the financial system.

Financial development may boost access to financial services, stimulate investment and economic growth, alleviate poverty, and strengthen financial stability, ultimately resulting in an improved standard of living for citizens (Nyangu et al., 2023). The theoretical justification for advancing the financial sector as a means to enhance citizens' quality of life is that access to financial services, including savings accounts, credit, insurance, and investment opportunities, enables individuals and businesses to manage risks more effectively, stabilize consumption, and accumulate wealth over time (Rashid et al., 2020). This may result in enhanced economic growth, elevated employment rates, and an improved standard of living for citizens. Additionally, a robust financial sector can foster financial stability by diminishing the probability of financial crises and enabling the efficient allocation of capital to productive endeavors (Abdulai & Issahaku, 2024). The Nigerian government is anticipated to formulate and execute diverse macroeconomic strategies to foster finance sector development (Gbarawae & Tonye, 2024).

African states are undeniably encountering numerous challenges as they prepare for the formation of the African Monetary Union and the implementation of a common currency. Economic growth continues to be inconsistent throughout the continent. West Africa is projected to expand at 3.3%, whereas East Africa is anticipated to have a growth rate of 1.8% in 2023 (World Bank, 2023). The most crucial aspect is comprehending the relationship between monetary policies, the financial system, and the real economy. The primary difficulty is that alterations in monetary policy by the planned African Central Bank may become increasingly challenging due to potential asymmetric effects across nations. Thus, a more profound understanding of the fundamental variables influencing monetary policy and its effects on the continent's financial development is essential for a comprehensive grasp of this topic (Effiong, 2020). In developing countries, particularly in the Sub-Saharan African region, the monetary policy credit channel is markedly distinct and regulated. This mostly results from fragile financial systems, systemic structural inflexibilities, and financial impediments. In industrialized economies, advanced financial infrastructure enhances the efficacy of monetary policy transmission mechanisms on bank lending. In emerging nations, institutional limitations hinder financial intermediation and the effectiveness of public policy. A deficient legislative framework, coupled with concentrated financial systems, further undermines the transmission of monetary policy (Abuka et al., 2019; Modugu & Dempere, 2022).

Considering the vast economic potential of the continent and the underdeveloped state of the financial sector in numerous African nations, financial development is regarded as a crucial instrument for fostering prosperity and alleviating poverty. However, challenges such as insufficient institutional capacity have hindered this progress (Ogunjumo, 2024). Similarly, several African nations persistently endure hyperinflation and rampant inflation, excessive dependence on foreign assistance and loans, money laundering and terrorism, as well as climate change resulting from global warming (Maku, 2024). The financial sector is expanding at an unmanageable rate, complicating the efforts of monetary policymakers to control liquidity, maintain stable exchange rates, avert asset market boom cycles, and regulate capital flows. Examining the impact of foreign direct investment on the implementation of monetary policy by central banks and its dissemination across the economy is crucial from a monetary policy standpoint (Salifu et al., 2024). Although theoretical reasons suggest that monetary policy can enhance financial development in African nations, it is crucial to evaluate the existing empirical evidence and objectively ascertain if it achieves the desired effects in practice. Nevertheless, several research contributions exist in the literature about the interrelationship between monetary policies and financial development, yet a consensus on their nexus remains elusive (Acharya et al., 2020).

In conclusion, our understanding of the impact of monetary policy on financial development inside the banking sector is limited. Does monetary policy uniformly affect financial stability and depth? Can monetary policy enhance financial access, or financial inclusion, even if central banks offer intermediary liquidity support to banks, effectively ensuring funding? What is the financial efficiency of banks in their role as lenders? This study seeks to explore the primary questions about the influence of monetary policy on financial development in Nigeria. Therefore, additional empirical analysis is required to elucidate the influence of monetary policy on financial development in Nigeria.

Objective of the Study

i. To examine the impact of interest rates on Nigeria's financial depth
ii. To assess the impact of interest rates on Nigeria's financial stability.
iii. To evaluate the impact of interest rates on Nigeria's access to finance
iv. To determine the impact of interest rates on Nigeria's efficiency of the financial system

Research Questions

i. What is the impact of interest rates on Nigeria's financial depth?
ii. Is there any impact of interest rates on Nigeria's financial stability?
iii. How is Nigeria's interest rate impacted by its access to finance)
iv. What is the impact of interest rates on Nigeria's efficiency of the financial system?

Research Hypothesis

i. H_{01}: interest rates do not significantly impact Nigeria's financial depth
ii. H_{02}: interest rates have no significant impact on Nigeria's financial stability.
iii. H_{03}: interest rates do not significantly impact Nigeria's access to finance
iv. H_{04}: interest rates do not significantly impact Nigeria's efficiency of the financial system

Significance of the Study

Monetary policy and its transmission are crucial inside the financial system for fostering growth across numerous economic sectors, especially in advancing the banking industry. The researcher noted that the ineffectiveness and inadequate transmission of monetary policy have adversely impacted Nigeria's financial development, causing it to lag behind other countries and continents globally. The results of this study will provide public sector managers and professionals with enhanced guidance for planning and decision-making, while also aiding professional associations and regulatory bodies in understanding monetary policy and financial development. This study will enable federal governments, the CBN, international organizations, public institutions, and other policy-making entities to evaluate the effectiveness and outcomes of their policies on the financial system and the economy at large; the findings will allow governments to maintain, reassess, or modify existing policies in their respective nations.

LITERATURE REVIEW

Concept of Monetary Policy

Monetary policy is regarded as an element of economic strategy aimed at fostering public welfare and economic advancement; a prevalent method for assessing its efficacy is by analyzing the impact of interest rates on GDP growth, investment, and inflation (Mehar, 2022). Monetary policy directly influences financial development by promoting a stable and robust financial system and ensuring price stability within the financial sector. This can also be utilized to influence the volume of credit and currency accessible within the economy. Bats et al. (2023) indicate that governments implement lower interest rates and reserve requirements to incentivize banks to increase lending and enhance credit availability, hence fostering economic growth and the development of the financial sector (Jin et al., 2023). The basic objectives of monetary policy are to stabilize price levels and to foster economic growth and employment (Ramedoust et al., 2022). The twenty-first century has experienced a resurgence of empirical study regarding the effects of monetary policy across various dimensions (Zhang et al., 2020; Li et al., 2022).

Recently, the financial crisis served as a wake-up call, demonstrating that numerous common beliefs were erroneous. Initially, following the stagflation of the 1970s, it was assumed that the period of tremendous moderation would provide financial stability. Secondly, during normal periods, prudential measures maintained financial stability, whereas in times of crisis, monetary policy addressed the fallout from economic instability. Post-2008 crisis monetary policy faced examination as a mechanism due to a paradigm shift from widely accepted perspectives and the established separation between prudential standards and monetary policy. Until now, financial stability has primarily been maintained through the regulation and oversight of individual banks.

In the evolving economic landscape, the crisis prevention mechanism is undergoing reconfiguration within the macro-prudential policy framework (Rauf & Adegboye et al., 2024).

Interest Rate

To stimulate their economies, rich nations have recently adopted exceptionally low or even negative interest rates. This may lead to diminished net interest margins for banks, adversely affecting their equity, profitability, and lending capacity (Ndoya et al., 2024). Modifying retail bank interest rates (both loan and deposit rates) and money market rates in reaction to fluctuations in policy rates is an essential component of interest rate mechanisms and operations. Adjustments to retail interest rates and money market rates are essential for the efficacy of monetary policy following any modification in the policy rate (Ehiedu & Oteme, 2024). Moreover, several interest rates exist within an economy, indicating competitive dynamics, the conditions associated with loans and deposits, and disparities in the standing and status of creditors and borrowers. In specific economies, interest rates are dictated by administrative fiat or rules. Locating information on interest rates that genuinely represent actual market transactions can be difficult in economies characterized by imperfect markets or when reported nominal rates fail to effectively depict real rates. Empirical research and the World Bank have identified the following interest rate indicators: real interest rate, deposit interest rate, lending interest rate, and interest rate spread (lending rate minus deposit rate) (World Bank; 2023). Therefore, this study will utilize the deposit interest rate as an indicator of interest rate (Acharya et al. 2020; Oyadeyi, 2023;) The deposit interest rate is the rate offered by commercial or analogous banks for demand, time, or savings deposits.

The Relationship Between Monetary Policy and Financial Development

Recently, advancements in financial transaction technology have prompted significant concerns for financial institutions and policymakers regarding the adequacy of current institutional frameworks and the availability of tools to ensure financial stability, efficiency, and the effectiveness of monetary policy. Financial development, particularly through the introduction of new financial assets, can skew the supply and demand of money in an economy, affecting interest rates and inducing volatility and unpredictability in the economy's determinants. Similarly, the novel payment methods have gradually transformed public behavior and diminished the importance of traditional financial transmission channels (Abusomwam & Izevbigie, 2024).

The advancements of the financial system are crucial for the implementation of monetary policy, particularly in Africa, which predominantly consists of developing and rising market nations, where the majority of businesses and external financing for households is derived from bank loans. Lending terms are essential for central banks seeking to regulate aggregate demand inside the financial sector (Al-Tal et al., 2034). This contrasts with established financial systems, where monetary policy may exert less influence on banks' lending activities due to their enhanced access to diverse funding sources and financial instruments. This results in diminished responsiveness to bank loan supply from the monetary policy stance due to the financial flexibility of banks, hence attenuating the influence of monetary policy on these institutions (Aisagbonbuomwan & Samuel, 2024).

Theoretically, the financial sector serves as the channel via which the effects of monetary policy on prices and output are transmitted. Credit channel monetary policy transmission serves as a principal method for predicting frictions within the financial system, and this technique enhances the influence of monetary policy on the real economy (Oje, 2024). Furthermore, the configuration and condition of the financial system play a pivotal role in influencing the effects of monetary policy. Consequently, the level of advancement of the financial sector is crucial in elucidating the impact of monetary policy on the economy; thus, a robust financial sector serves as a potent catalyst for economic growth by fostering domestic savings, which ultimately results in productive investments (Fuseini et al., 2024). In summary, financial development is essential for the velocity and adaptation of the money market and retail interest rates in response to alterations in the policy rate within any economy (Oyadeyi & Akinbobola, 2023).

Theoretical Review

Monetary Policy Transmission Mechanism Theory

The fundamental principles of the Transmission Mechanism Theory encompass the identification of many channels through which alterations in monetary policy variables, such as central bank interest rate decisions or modifications in the money supply, influence the actual economy (Bashir et al., 2020). The channels comprise the interest rate channel, credit channel, and asset price channel (Liu, 2023b). The interest rate channel asserts that alterations in the central bank's policy rates affect borrowing costs for families and enterprises, hence influencing their spending and investment choices (Rehman et al., 2023). The credit channel highlights how changes in monetary policy can impact the lending practices of financial institutions, hence affecting credit availability (Munir, 2020). The asset price channel indicates that fluctuations in interest rates can affect financial asset prices, hence influencing wealth and expenditure (Amusa, 2022). The Transmission Mechanism Theory is predicated on the premise that alterations in the central bank's policy

tools directly affect interest rates and, consequently, other economic variables (Didigu et al., 2022). The theory posits a predictable and systematic correlation between alterations in monetary policy and the actions of economic agents (Effiong et al., 2020).

Critics of the Transmission Mechanism Theory contend that it simplifies the intricacies of the actual economy and that the presumed links are not invariably as direct as the theory suggests (Brózda-Wilamek, 2021). Certain economists argue that the theory may not encompass the behavioral intricacies of financial institutions and households, particularly during times of financial distress or crises (Ha et al., 2022). Moreover, opponents emphasize the difficulties in accurately quantifying the effects of alterations in monetary policy across different channels (Blot et al., 2020). The Transmission Mechanism Theory posits that changes in monetary policy can substantially impact financial development (Laumer & Schaffer, 2023). An expansionary monetary policy that reduces interest rates can encourage borrowing and investment, hence promoting financial growth (Filardo & Siklos, 2020). Conversely, a contractionary policy characterized by elevated interest rates may result in diminished lending and investment, thus obstructing financial development (Purnamawati, 2021). The theory offers a framework for comprehending how the central bank's activities can affect the financial sector and, consequently, the wider economy (Aho, 2023). It is crucial to evaluate the theory alongside additional aspects and theories to achieve a thorough comprehension of the intricacies of monetary policy and financial development (Denoncourt, 2023).

Empirical Review of Related Studies

Ozili and Ndah (2024), examined the impact of financial development on bank profitability. The ordinary least squares and generalized method of moments regression techniques were employed to assess the influence of financial development on the profitability of the Nigerian banking sector. The results indicate a substantial negative correlation between the ratio of financial system deposits to GDP and the non-interest revenue of Nigerian banks. This suggests that an increase in financial system deposits relative to GDP diminishes the non-interest revenue of Nigerian banks. The findings indicate that increasing expansion of the Nigerian financial sector correlates with diminished profitability for banks in Nigeria. The authors note that bank concentration, nonperforming loans, cost efficiency, and inflation levels are major predictors of the profitability of Nigerian banks. Regulators are advised to implement market-enabling policies that facilitate the emergence of new banks in the banking sector. The introduction of new banks can result in an augmentation of financial system deposits and an expansion of credit supply for economic growth. Regulators must comprehend the function of Nigerian banks in fostering financial growth and seek methods to interact with these institutions for the advancement of the financial sector.

Chinda (2024), analyzed the relationship of financial development, trade performance, and economic growth in Nigeria from 1985 to 2021. Financial deepening (FD), government spending (GOVEXP), inflation rate (INFL), exports (EXP), and imports (IMP) serve as proxies for the independent variables, while real gross domestic product (RGDP) is utilized as the indicator of economic growth, the dependent variable. The data utilized in this analysis were obtained from secondary sources, including the World Bank, the Central Bank of Nigeria's annual statistical bulletin, and World Development Indicators. The Eview10 Software was employed to do empirical and econometric data analysis. The stationarity test indicates that financial development, government expenditure, trade openness, and real gross domestic product are all integrated of order one I(1), however the inflation rate is integrated of order zero I(0). The data were examined utilizing the Autoregressive Distributed Lag model. The ARDL results indicate that, in the long term, financial development and government expenditure have positive connections with real gross domestic product, and these relationships are statistically significant. The report, among others, advocates for the promotion of suitable trade and foreign exchange policies that promote export expansion, as exports are a catalyst for economic growth. Effective execution of import control measures will enhance the comprehension of the factors influencing import behavior.

Iwedi (2023), analyzed the influence of monetary policy on the vulnerability of the banking sector in Nigeria from 1986 to 2022. The financial time series method was employed to collect secondary data, as the variables examined are quantitative. The variables encompass bank distress levels, prime lending rates, maximum lending rates, savings rates, Treasury bill rates, Treasury certificate rates, monetary policy rates, narrow money supply, broad money supply, and currency ratio. The data for these variables were sourced annually from the Central Bank of Nigeria (CBN) statistical bulletin from 1986 to 2022. The stationarity of the variables was evaluated utilizing the Augmented Dickey Fuller (ADF) unit root method because of structural fractures. Upon verifying the mixed integration characteristics of the variables, they were converted to first order and modeled utilizing vector autoregression (VAR) grounded on co-integration tests following the methodology established by Johansen (1991, 1995). The research determined that 16.8% of the alterations in the dependent variable could be ascribed to fluctuations in Model 1. This claim is additionally corroborated by the F-statistics and the corresponding probability value. The findings for Model II indicated that the Error Correction Model (ECM) is suitably configured, with the independent variables explaining 50.3% of the changes in bank distress levels. Model three similarly indicated that the independent variables may explain

48.7% of the variance in bank distress levels.
Oyadeyi (2023), examined the influence of financial development in Nigeria, specifically its effect on central bank monetary policies and interest rate mechanisms, including the monetary policy rate and various critical rates such as money market rates, lending rates, and deposit rates, utilizing the Monte-Klein Model methodology for banking. The investigation encompassed the duration from 1981 to 2021. The study demonstrated partial interest rate pass-through in Nigeria, notably more significant in the long term than in the short term, perhaps affected by factors such as interest rate rigidity, asymmetric knowledge, and switching costs associated with banks. Furthermore, it determined that financial growth reduces the influence of monetary policy on interest rate pass- through, with alterations in the policy rate impacting deposit and lending rates within the announcement year, as evidenced by the asymmetric mean adjustment lags.

Farajnezhad (2022), evaluated the impact of monetary policy on the provision of bank credit in South Africa. A random effects and fixed effects model are employed for data analysis utilizing a sample of 50 commercial banks from South Africa spanning the years 2009 to 2018. The study concludes that in South Africa, the loan amount significantly correlates with the macroeconomic variable of inflation. The study's conclusions indicated a significant negative correlation in South Africa between the interplay of macroeconomic variables, specifically inflation, and the bank characteristic of liquidity ratio concerning the loan amount. African central banks should utilize data on the volume of loans to understand the importance of the credit channel as a critical component of the monetary policy transmission mechanism. They must prioritize effective inflation control, prudent banking regulation, and a balanced monetary policy approach while fostering financial inclusion and adaptability to evolving economic conditions to enhance lending and stimulate economic growth.

Dzeha et al. (2022), analyzed the impact of monetary policy on bank profitability in Ghana, utilizing data from 29 banks from 2006 to 2016 and employing the panel random effects model. The results indicate that an increase in monetary policy basis points diminished banking profitability, whereas the average monetary policy rate enhanced banking profitability. The monetary policy basis point and rate indexes created diminished and augmented banking profitability, respectively. Although these results may appear paradoxical, they possess both theoretical and empirical support. Consequently, basis point increments constitute a monetary policy tightening mechanism that results in elevated lending costs, reduced borrowing, and diminished short-term profitability. In the long term, banks modified their loan rates and deposit terms to account for basis point fluctuations advantageous to them; thus, the average monetary policy rate positively influenced banking profitability. Furthermore, the easing of monetary policy, characterized by a reduction in basis points and interest rates, augments banks profitability.

Jungo et al. (2022), investigated the correlation between monetary policy and financial inclusion in 41 Sub-Saharan African (SSA) countries and 31 Latin American and Caribbean (LAC) nations from 2005 to 2018, employing the panel vector autoregression (PVAR) model. The study findings indicate a reciprocal relationship between financial inclusion and monetary policy in Sub-Saharan Africa and Latin America, wherein monetary policy promotes financial inclusion, and increased financial inclusion improves the efficacy and results of monetary policy, especially in managing inflation. These findings highlight the significance of advancing financial inclusion, as it improves the efficacy and results of monetary policy while also cultivating a mutually reinforcing dynamic, especially for inflation management, in Sub-Saharan Africa and Latin America.

Cai (2021), evaluated the impact of monetary policy on banks' credit allocation decisions in China during 2008 to 2009 with the generalized method of moments (GMM) estimator. The expansionary monetary policy resulted in the misallocation of bank credit to less productive enterprises after accounting for confounding variables. Nevertheless, we observe that investment rose more significantly for enterprises with higher productivity. Further analyses indicate that this transpired partially due to more productive enterprises accumulating cash before to the crisis, and partly because less productive firms allocated greater resources to financial assets. Policymakers can mitigate credit misallocation by incentivizing productive enterprises to invest, overseeing and regulating bank lending, fostering responsible financial practices, addressing investments in financial assets by less productive firms, and improving data and risk assessment methodologies.

Apanisile and Osinubi (2020), investigated the influence of financial development on the efficacy of monetary policy transmission mechanisms in Nigeria. The research utilized quarterly data spanning from January 2004 to April 2016 and implemented the dynamic stochastic general equilibrium (DSGE) model. The findings indicate that financial development throughout the examined period positively influences the monetary policy transmission mechanism. The credit channel is the most effective in increasing output, whereas the expectation channel is the most effective in stabilizing prices. Consequently, the Central Bank ought to contemplate the utilization of credit channels as a means to stimulate output for the attainment of sustainable growth. Efforts should focus on examining expectation channels as a means of mitigating

inflation rather than relying on interest rates.

RESEARCH METHODOLOGY

Research Design

The selected research design is ex-post facto, as the data utilized are secondary data obtained from the World Development Indicator (WDI) and Global Financial Development (GFD). It primarily focuses on establishing a philosophical foundation for determining the nature of possible knowledge and ensuring its legitimacy and sufficiency. The study employs an ex-post facto research approach due to its reliance on pre-existing events and the necessity of measuring variables through data obtained from the countries under examination.

Sources and Methods of Data Collection

This study utilized secondary data from a compilation of development indicators sourced from officially recognized international entities. We will extract annual historical data from the World Development Indicator (WDI) for the dataset concerning interest rates, specifically Broad Money (as a percentage of GDP) and Deposit Interest Rate. Concurrently, data pertaining to financial stability, depth, access, and efficiency will be sourced from the Global Financial Development, including Bank Z-Score, domestic credit to the private sector, bank branches per 100,000 adults, and bank net interest margin, respectively. The study on Nigeria has a comprehensive sample span of 20 years, from 2004 to 2023, resulting in a panel data framework (cross-sectional and time series) with 95 data points. Each variable and its proxies were computed using a formula derived from the literature to produce the data required for populating the panel (Sena et al., 2021; Tomar & Kesharwani, 2022; Ugurlu-Yildirim et al., 2020). The panel data was utilized to analyze the behavior of variables across time and across different contexts (Ahiadorme, 2022; Houngbedji & Bassongui, 2023; Modugu & Dempere, 2022).

Method of Data Analysis

The secondary data was examined quantitatively through descriptive and inferential statistics. Descriptive statistics describe the characteristics of the data that has been collected and examined. Maximum, minimum, mean and standard deviation will be employed as descriptive statistics. At a 5% significance level, inferential statistical techniques will be applied to assess the hypotheses. The correlation coefficient will be used to determine the strength of the relationship between the variables. The link between the variables will be investigated using the ARDL. Some of the past empirical studies may be affected by two limitations. The first limit is that these studies used cointegration techniques based on either the Engle and Granger (1987) cointegration test or the maximum likelihood test based on Johansen (1988) and Johansen and Juselius (1990). Or, these cointegration techniques may not be appropriate when the sample size is too small. Ghilous & Ziat (2023), uses the bounds-testing cointegration approach developed by Pesaran et al. (2001) which is more robust for the small sample. The second limitation is that by using cross-sectional data some studies do not address the country-specific issues (Ghilous & Ziat, 2023; Kassi et al., 2023; Musa et al., 2023), which is tackled by this country. The construct of the variables applied for this study is outlined in table 1.

Table 1: Measure of Variables

S/N	Variables	Abbreviation	Measuring unit	Source
1	Interest rate	DIR	Deposit interest rate (%)	CBN
2	Financial Stability	BZS	Bank Z-score	World Bank, Globa
3	Financial Depth	DCPGDP	Domestic credit to private sector (% of GDP)	World Bank,
4	Financial Access	BBA	Bank branches per 100,000 adults	Global Financial
5	Financial Efficiency	BNIM	Bank net interest margin (%)	Development (GFD) Database

Source: Author's Computation, (2024)

Unit Roots Test

In time series analysis, before running the causality test the variables must be tested for stationarity It is expedient to check for the non-existence of unit roots in the variables, as the consistency of the estimates depends on it. This study carried out the panel unit root test at the level and the first difference to determine whether a serial correlation exists. The Levin, Lin, and Chu Test and the Im, Pesaran, and Shin Test will be used to test the stationarity of the variables used, based on the view of Engle and Granger (1987), who states that if a model only includes stationary variables, one can assume that estimates are normally distributed, and

confidence intervals can be calculated.
On the other hand, non-stationarity might lead to erroneous results when tests are used in such situations. The objective is to ensure that the variables are not I(2) so as to avoid spurious results. In the presence of variables integrated of order two, we cannot interpret the values of F statistics provided by Pesaran et al. (2001). Thus, according to the usual expectation, the variables should be I(0) in levels and I(1) in the first differences. The variables must, however, be I(1), i.e., stationary in first differences, or the variables must be integrated in the same order.

Model Specification

This study utilized the model proposed by (Kwilinski et al., 2023) and Ewubare et al. (2019), in which Interest rate, represented by Deposit interest rate (%) (DIR), Financial Stability depicted through Bank Z-score (BZS), Financial Depth indicated as Domestic credit to private sector (% of GDP) (DCPGDP), Financial Access shown as Bank branches per 100,000 adults (BBA) and Financial Efficiency depicted as Bank net interest margin (%) (BNI). Herein, the specific functional relationship between interest rate and the other variables is defined as follows;

DIR = f (BZS, DCPGDP, BBA, BNI) ..... (3.1)

Therefore, the econometrical form of the equation becomes:

The model is formulated to capture the relationship between the effect of green finance on sustainable development during the period under review. The model is explicitly expressed as:

Model: $DIR_t = \alpha + \beta_1 BZS_t + \beta_2 DCPGDP_t + \beta_3 BBA_t + + \beta_4 BNI_t + \mu_t$ .....(3.2)

Where;

DIR = Interest rate

BZS = Financial Stability DCPGDP = Financial Depth BBA = Financial Access BNI = Financial Efficiency α = Constant term

μ = error term t= time

β_1- β_4 = Coefficient of the variables

The Model Transformation using the proxies for this study shows that;

ANALYSIS AND RESULTS

Descriptive Statistics

The 19-year time series data collected for this study delineated in table 1 indicates a minimum least statistical value of 2.24 for BNIM, and with the highest mean statistical value of 21.6520. Accordingly, the standard deviation entails 3.03717 as the highest statistical point which is for DCPGDP while the Skewness lowest statistics of .295 for BNIM and a highest statistic of 1.059 for DCPGDP with the SE of .512 for all the variables were generated. Equally, a Kurtosis highest point of 1.336 for DCPGDP and lowest point for -1.135 for BBA were equally generated with an SE of .992 for all the variables involved.

Table 2: Descriptive Statistics for Nigeria

	N	Minimum	Maximum	Mean	SD	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	SE	Statistic	SE
DIR	20	4.21	14.22	9.0417	2.81568	.111	.512	-.462	.992
BZ	20	12.19	22.05	16.4704	2.45622	.449	.512	.058	.992
DCPGDP	20	8.12	19.63	12.1348	3.03717	1.059	.512	1.336	.992
BBA	20	3.78	6.56	5.0959	.87215	.483	.512	-1.135	.992
BNIM	20	2.24	11.92	6.5826	2.41851	.295	.512	.577	.992

Source: Researcher's Computation, (2024).

Heteroskedasticity Test

Table 3: Heteroskedasticity Test

F	Observed square	R-Prob. F(1,504)	Prob. (1)	Chi-Square	Significance Level
13.72115	12.56569	0.0004	0.0004	0.05	

Source: Researcher's Computation, (2024).

Also, table 3 above confirms the presence of Heteroskedasticity via the ARCH test as the Observed R-square value of 0.0014 which is significantly less than 5% level of significance.

GARCH (1,1) Estimation Result

Table 4: GARCH

		Mean Equation		
Variable	Coefficient	Std. Error	Z – Statistics	Prob.

C	41.81813	0.084157	281.6113	0.0000
		Variance Equation		
C	5.216973	3.358687	2.822230	0.0871
αt	2.073233	0.352991	6.132281	0.0002
βt	-0.435855	0.276361	-0.2240101	0.9014

Source: Researcher's Computation, (2024).

The GARCH (1,1) estimation model depicted in table 4 above shows that parameter αt describe the effect of the previous time variable to the current time variable and the βt parameter shows the impact of the variable at the previous time or lagged value on the variable at current period. In combining both the αt and βt provides the short-term power in ascertaining the variables. The bigger value of ($\alpha t + \beta t < 1$) makes the short-term value stronger. It can be deduced that short term value plays broader role in ascertaining the variables with a combined sum of 0.94. This position is in line with the findings from Muhammed & Adindu (2023), which also discovered variables to be volatile. The conditional variance series derived from the GARCH (1,1) model, served as the volatility data for variables and was integrated into the VAR system.

Unit Root Test

As previously stated, analysis based on time series requires the data to be stationary as non- stationary data leads to misleading inference. So, unit root test is employed to test for the data stationary nature through the Augmented Dickey-Fuller (ADF) and Phillips Perron (PP) tests. Table 5, shows the result for both raw data and that of the differenced data after undergoing for both the Augmented Dickey-Fuller test and Phillips Perron test. It is expected that the series do not contain unit root in order to find relationship among the variables in the long run. The test is carried out at level, and first difference using 5% Mackinnon Critical value (Iwegbu, et al., 2019).

Table 5: Results of Augmented Dickey-Fuller Test & Phillips Perron at level and first difference

ADF AT LEVEL					
Variables	**T-Statistics**	**Lag Order**	**P-Value**	**Alterlocal Hypothesis**	**Remark**
DIR	-2.3844	2	0.4219	Stationary	Not Stationary
BZ	-2.1850	2	0.4216	Stationary	Not Stationary
DCPGDP	-2.0091	2	0.4514	Stationary	Not Stationary
BBA	-2.1149	2	0.4716	Stationary	Not Stationary
BNIM	-2.2114	2	0.4512	Stationary	Not Stationary
PHILLIPS PERRON TEST AT LEVEL					
DIR	-40.140	3	0.3240	Stationary	Not Stationary
BZ	-40.042	3	0.3412	Stationary	Not Stationary
DCPGDP	-56.019	3	0.3827	Stationary	Not Stationary
BBA	-40.980	3	0.3981	Stationary	Not Stationary
BNIM	-35.890	3	0..3221	Stationary	Not Stationary
ADF AT FIRST DIFFERENCE					
Variables	**T-Statistics**	**Lag Order**	**P-Value**	**Alterlocal Hypothesis**	**Remark**
DIR	-3.6996	2	0.05602	Stationary	Stationary
BZ	-3.6857	2	0.05709	Stationary	Stationary
DCPGDP	-4.1502	2	0.02812	Stationary	Stationary
BBA	-3.6854	2	0.05711	Stationary	Stationary
BNIM	-4.2512	2	0.04141	Stationary	Stationary
PHILLIPS PERRON TEST AT FIRST DIFFERENCE					
DIR	-32.071	3	0.01	Stationary	Stationary
BZ	-32.437	3	0.01	Stationary	Stationary
DCPGDP	-48.628	3	0.01	Stationary	Stationary
BBA	-32.434	3	0.01	Stationary	Stationary
BNIM	-33.534	3	0.01	Stationary	Stationary

Source: Researcher's Computation (2024).

The ADF and PP test results shows that all the variables are not stationary at levels, as the absolute value of their respective t-statistics values are less than the absolute 0.5% critical value inboth tests. However, after testing them at their first difference they were all stationary as all the variables are integrated of the same order of 2. The result is majorly consistent with findings from Muhammed (2023), whose variables became stationary at first difference. Therefore, the Co- integration test is necessary to further check for the long run relationship among the variables (Iwegbu, *et. al.*, 2019).

Co-integration Test

The Johansen test for Cointegration was employed to test for the long run relationship among the variables.

When two or more time series data are cointegrated, it means the presence of long run statistical relationship (Selva, 2019). Table 6 shows the Eigen normalised cointegration relations and Eigen weights loading matrix in the Johansen Cointegration analysis.

Table 6: Johansen test for Co-integration

VALUES OF TEST STATISTICS AND CRITICAL TEST					
	Test	**10pct**	**5pct**	**1pct**	
r <= 4	0.15	6.50	8.18	11.65	
r <= 3	9.86	15.66	17.95	23.52	
r <= 2	27.30	28.71	31.52	37.22	
r <= 1	46.73	45.23	48.28	55.43	
r = 0	72.00	66.49	70.60	78.87	
EIGEN NORMALISED COINTEGRATION RELATIONS					
DIR	0.10841780	0.1056590613	0.006579688	-1.850896e-02	2.280038e-01
BZ	-1.26269956	0.0884279616	6.090007492	1.535706e+02	1.112376e+02
DCPGDP	-0.00170223	-0.0009931287	0.001297502	4.070976e-04	-3.251904e-04
BBA	-0.10648718	0.0651322215	-0.586281351	-1.764070e+01	- 7.815972e+00
BNIM	0.08842796	-0.00070223	0.08842796	-1.00070223	2.112276e+02
EIGEN WEIGHTS LOADING MATRIX					
DIR	-199.14584	244.34329	-75.620971	9.4035518	-10.6837548
BZ	-19.32974	15.70237	-4.902729	0.5921169	-0.6963618
DCPGDP	88.82181	328.05318	-449.670120	-1.8916763	-5.4921012
BBA	-174.97971	223.39939	-69.758759	8.4613450	-9.9094210
BNIM	80.82181	110.6837	-12.241738	30.02113	-9.41356

Eigenvalues (lambda): 0.485741776, 0.400250946, 0.368052165, 0.225553304, 0.003827619 and 0.09842796 for the six variables considered in this study.

Source: Researcher's Computation (2024).

The procedure for the cointegration test began with the null hypothesis that there are no cointegration among the systems of eqautions in the VAR model. A rejection of this hypothesis implies the existence of Cointegration among some or all the equations. Table 4.3 shows the result for both the t-test and critical value test, the Eigen normalised cointegration relations and the weights load matrix. The second part of the divide indicates the existence of long run relationship among all the 5 equations in the model which shows the rejection of the null hypothesis at 5% level of significance this shows that the series is cointegrated owing to the fact that the individual time series has an integration order that is more than the linear combination of the time series. The Linear combination of the six time series variables is s = 0.20841780*DIR - 2.26269956*BZ
- 0.00170223*DCPGDP - 0.20648718*BBA + 0.09842796BNIM.
The linear combination shown in the above indicated the ADF value of -3.786, Lag order of 3 and the p-value of 0.03121 posting that there is enough evidence to reject the null hypothesis since the p-value is less than the 0.05 level of significance. This shows that a relationship exists between the variables considered for this study for the period under review.

Diagnostic Test

In order to ensure the efficiency of the VAR model and its correlation with the white noise assumption, residual based test of Breusch-Godfrey L-M test for autocorrelation and Jarqui Berra test for normality were conducted for the employed model.

Residual Autocorrelation test

Table 7: Residual Serial Correlation LM Tests

	DIR	**BZ**	**DCPGDP**	**BBA**	**BNIM**
DIR	0.005086	0.5924	4.455	9.752	95.1135
BZ	0.592393	95.1135	622.210	1267.517	119.852

DCPGDP	4.454501	622.2101	4058.519	8895.182	128.211
BBA	9.751868	1267.5170	8895.182	18457.244	1168.80
BNIM	0.592393	95.1135	622.210	1267.517	119.852
DIR	1.0000	0.9903	0.9903	0.9903	1.0000
BZ	0.9903	1.0000	1.0000	1.0000	0.9903
DCPGDP	0.9903	1.0000	1.0000	1.0000	0.9903
BBA	0.9903	1.0000	1.0000	1.0000	1.0000
BNIM	1.0000	0.9903	0.9903	0.9903	1.0000

Source: Researcher's Computation (2024).

For the system model, The LM Serial Correlation Test was employed to test for residual autocorrelation among the variable, this is shown in Table 7 to reject the null hypothesis, that no autocorrelation exists among the residuals, the probability of the observed LM-statistics must be greater than 5%. The result depicts a rejection of the null hypothesis for all the lags, implying the inexistence of serial correlation among all the variables in the VAR model.

Normality test

Table 8: Multivariate Normality Test

Jarque-Bera Test		
Chi-Squared	**df**	**p-value**
333.69	10	<2.2e-11
	Skewness	
53.126	5	2.742e-13
	Kurtosis	
290.56	5	<2.2e-11

Source: Researcher's Computation (2024).

The multivariate normality test result for the model depicted in table 8 indicated the rejection of the null hypothesis which is the residuals or error terms in the VAR System shows that they are normally distributed with the combined p-values of Jarque-Bera, skewness and Kurtosis probability statistics which is less than the 5% level of significance. The result posited that all the 5 equations in the model are normally distributed.

Serial Test

Table 9: The Portmanteau test (asymptotic)

Chi-Squared	**df**	**p-value**	**Significance Level**
222.04	60	0.001912	0.05

Source: Researcher's Computation (2024).

The Portmanteau test output for the equation shown in table 9. The probability of the p-value of 0.001912 which is less than the 0.05 significance level, this implies the rejection of the null hypothesis that the residual value is serialized; therefore, we can conclude that residual value of the dependent variable is not correlated with the error term.

Panel Regression Model – DIR BZS, DCPGDP, BBA & BNIM

According to the outcome of this study (table 10), it shows that there is a significantly positive impact of BZS on the DIR indicating about 15% impact as reiterated by its 15.9% coefficient value while the DCPGDP, shows an insignificant positive impact on the DIR reinforced by its coefficient value of about 1.2%. For the BBA, it shows a positively low impact on DIR with coefficient of about 4% while the BNIM negatively impact the DIR shown by its coefficient of -24.5%. Consequently, the DIR regression model posits DIR = -24.540BNIM + 1.213 DCPGDP + 4.330BBA + 15.859BZS.

Table 10: Estimated Results: Panel Regression Model - BZS, DCPGDP, BBA & BNIM

DIR	**REM**		
	Coef.	**T**	**P>|t|**
BNIM	-24.540	-2.610	.020
DCPGDP	1.213	1.227	.239

BBA	4.330	1.450	.168
BZS	15.859	3.012	.009
_cons	27.343	.307	.763
Number of groups	5		
Number of obs	95.00		
F (2, 92)	.860		
Prob > F	.441		
R-squared	.806		
Adj R-squared	.755		

Source: Author's computation (2024).

Discussions

Imouhele and Ismaila (2022), assert that monetary policy is a macroeconomic tool employed by monetary authorities to control the economy and achieve specific objectives and agrees with this study that monetary policy impacts the economy via several routes and methods. The transmission mechanisms encompass the interest rate, currency rate, asset price, and credit channel (Choi et al., 2022). As per the traditional interest rate channel, a reduction in the natural interest rate diminishes the cost of capital while lower real interest rates subsequently result in heightened business, inventory, and residential investment, alongside sustained consumer expenditure, consequently augmenting aggregate output (Oyadeyi, 2023; Dang & Nguyen, 2021). This suggests that adjusting interest rates to achieve the goals of monetary policy would be ineffective with diminished financial access (BBA = 4.3%) meaning that monetary policy can influence bank lending through many mechanisms of which the conventional interest rate channel suggests that altering rates affects investment and consumption choices as this step encourages the financial sector to launch additional credit products into the economy via various lending avenues. According to Crosignani et al. (2020), implementing either an expansionary or a contractionary monetary policy would ultimately result in changes to the pricing of government bonds and it is also widely acknowledged that the sort of monetary policies in place have an impact on the pricing of stocks. The presence of contractionary monetary policy triggers the financial institutions to lend money to businesses at higher interest rate which means that the current circumstances, there will be an increase in the cost of living in Nigeria, which have a detrimental impact on profitability of business leading to financial inefficiency (BNIM = -24.5%). However, Hossin (2023), agrees that it is certain that the stock markets of a nation would see a decline in value and the most essential thing to note is that this strategy has an influence that is raising the levels of the prices. According to Bui et al. (2021), when there is excessive inflation in a country such as Nigeria, expansionary policy is not the proper course of action of which financial instability can be witnessed (BZS = 15.86%). As per Kesharwani (2022), when this kind of scenario occurs, the monetary authorities in charge of such central bank ought to execute measures that have the effect of contracting the money supply. These policies can include raising interest rates or selling government bonds on the open market. The money markets are significantly impacted by monetary policy decisions (Farajnezhad, 2022), meaning that monetary policies have substantial effects on capital markets. According to Ibrahim (2021), financial systems that are controlled by banks are more conducive to growth in poor nations' economies, however in rich countries' economies; the oriented systems market would be more promising for growth in the long run that can trigger financial depth (DCPGDP = 1.2%). In contrast, Farajnezhad (2022), discovered that the indicators of the banking sector had a lower correlation to the performance of investments compared to the cash flow and stock market's indicators. There are a great number of reasons that have been produced to highlight the weak link or the negative influence that financial development has on economic progress. These arguments make reference to the origins and characteristics of financial depth.

CONCLUSION AND RECOMMENDATIONS

This study that investigated the monetary policy and financial development in Nigeria concludes that there is a significantly positive impact of BZS on the DIR indicating about 15% impact as reiterated by its 15.9% coefficient value while the DCPGDP, shows an insignificant positive impact on the DIR reinforced by its coefficient value of about 1.2%. For the BBA, it shows a positively low impact on DIR with coefficient of about 4% while the BNIM negatively impact the DIR shown by its coefficient of -24.5%. This study recommended that;

1. This study suggests that deepening financial sector growth is necessary to boost the monetary transmission mechanism meaning that it is important to acknowledge the lag in the effects of interest rate modifications on financial stability, hence, requiring a measured approach to assess the efficacy of policy alterations on the nation's overall financial stability.
2. There is need to formulate targeted monetary policies that specifically cater to the credit requirements of financially constrained firms and those deemed relatively risky, in order to promote credit creation and

allocation, thereby enhancing economic development and alleviating financial risks.

3. There is need for the public authorities to engage in the banking sector via subsidies, as these might simultaneously reduce loan interest rates and enhance investment rates. This policy will emphasize the beneficial effects of interest rates on financial stability in Nigeria.

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