FINANCIAL SECTOR DEVELOPMENT AND ECONOMIC GROWTH IN NIGERIA

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ABSTRACT
The study examines the relationship between financial development and economic growth in Nigeria from 1980 to 2022. The study is anchored on the endogenous growth theory. Data were sourced from the Central Bank of Nigeria Statistical Bulletin. The analysis of the data was done using Autoregressive Distributed Lag (ARDL) model and Toda-Yamamoto Granger non-causality test. The study found that a 1% increase in Financial Deepening leads to 0.79% increase in economic growth and a 1% increase in stock market capitalization leads to 0.29% increase in economic growth. A 1% increases in real interest rate results in 0.55% increase in economic growth. There is unidirectional causality running from Gross Domestic Product to stock market capitalization, real exchange rate, and inflation. There is bidirectional causation between Gross Domestic Product and real interest rate. However, there is no causal relationship between gross domestic product and financial deepening in Nigeria. Government should pursue policies that can help develop the financial sector.

Keywords: Financial development, Financial Deepening, Economic growth**,** ARDL

JEL Classification: G21, E44, O33

1. INTRODUCTION
One of the targets of every country is to achieve a sustainable economic growth that will lead to economic development in the long-run with many sectors of the economy contributing their quota. In Nigeria, development of the financial sector is a conscious attempt to drive economic growth. The Central Bank of Nigeria and monetary committees has formulated many policies to ensure the financial system in the country measure up with global reality. The policies provided avenues for the mobilization and allocation of funds to other sectors of the economy through financial intermediaries.

The financial sector through banking sectors undergo series of reforms in order to strengthen the sector, such reforms as consolidation exercise of 2004, privatization, commercialization and merger and recapitalization process, and other financial reform had taken place to consolidate the sector with a view to sustaining economic growth (Olaniran, 2022).

The development of the financial system and its instruments is an important indicator of economic growth, foreign investment attraction, poverty reduction and the overall development of the country's economy (Kapidani & Luci, 2019). Financial sector development implies improvements in the functioning of the financial sector, these ranges from enhanced access to banks, enlarged diversification avenues, better quality of information and incentives for cautious borrowing and supervision (Ikubor et al., 2022). Developing the financial sector

stimulates the economy and reduces poverty. The financial sector comprises a set of institutions, markets and instruments which include a legal and regulatory framework to allow transactions and credit extensions to take place. The sector basically helps to mop up funds and make them available to the private and public sectors as investable capital.

Financial deepening is the increased provision of financial services with a wider choice of services for the people. It generally means an increase in the ratio of money supply to gross domestic product (GDP). Financial deepening involves a combination of several activities and institutions. Yousuo, and Ekiou (2021) notes that in developing economies, the term is associated with increases in the activity of financial intermediaries, like commercial banks and savings institutions. In developed nations, financial intermediation is often dominated by direct placement or capital markets. But for developed countries, financial intermediation is measured by the proportion of national wealth held through financial intermediaries. The concept of financial development has a far reaching implication as it is not only beneficial at the time of its introduction but continue to modify the way things are done afterwards. That is both the institution and structures and process of financial market activities are affected in a positive way by this introduction. It then follows that there would be deliberate regulatory framework given that financial deepening is dynamic (Okoafor et al., 2021).

The CBN and the Nigeria government have implemented various programmes and reforms over the years to ensure the growth and stability of the financial system with the recognition that a stable and vibrant financial system would propel economic growth and development.

The reforms have mainly been in response to the challenges posed by developments in the financial system such as systemic crisis, globalization, technological innovation, and financial crisis. The reforms often seek to act to strengthen the system, prevent systemic crisis, strengthen the market mechanism, and ethical standards (Nzotta and Okereke, 2009). In order to ensure that deposit money banks (DMBs) have adequate capital to expand and increase financial inclusion in the society, as well as have enough funds to accommodate any shock that may arise in the course of their normal operations especially the shock arising from nonperforming loans, the CBN reviewed the minimum capital requirements of DMBs thirteen times between 1952 and 2010 from a paltry minimum capital requirement of £12,500 and £100,000 for indigenous and foreign banks respectively in 1952 to the current limit of N25 billion for national DMBs and N50 billion for international DMBs (Central Bank of Nigeria [CBN],2021).

The CBN also formulates various programmes aimed at providing access to credit by micro and small entrepreneurs in the economy. Some of such programmes include the Agricultural Credit guarantee Scheme (ACGSF), the N220billion Micro, Small and Medium Enterprises Fund (MSMEDF), and the recent Anchor Borrowers' Programme. Specifically, the ACGSF was introduced in 1977 to enable farmers exploit the untapped potentials of Nigeria's agricultural sector, reduce inflation, lower the cost of agricultural production (i.e. food items), generate surplus for export, increase Nigeria's foreign earnings as well as diversity its revenue base (CBN website). The scheme encourages DMBs to lend to farmers against a guarantee of 75 percent of any amount lent by the CBN. Similarly, the Anchor Borrowers' Programme which was launched in 2015 is intended to increase credits to small farmers producing key agricultural commodities.

In order to bridge the huge financing gap to micro, small and medium enterprises (MSMEs), the MSMEDF was set up in 2013 to enhance access to credit by MSMEs, increase productivity and output of microenterprises, increase employment, engender inclusive growth and promote a sound financial system (CBN, 2021).

As part of its regulatory function, the CBN also regularly inspect the books of banks' through on-site and off-site reviews to ensure that DMBs are carrying out their operations in line with

laid down guidelines. It also conducts training on credit creation and related matters for staff of DMBs to enable the staff acquire the required skills for granting good quality loans.
The CBN is equally implementing the financial inclusion programme aimed at making more Nigerians to have bank accounts and enjoy banking services including credits. The cashless policy is also being implemented throughout the country with all its attendant benefits. These policies/reforms are all aimed at deepening financial services in the country. Small Financial Sector: Nigeria faces the challenge of having a relatively small financial sector compared to developed economies.

However, the policies are not without challenges. These challenges are the small size of the Nigerian financial sector when compared with developed economies and other emerging market economy, ineffective regulatory frameworks that needs strengthening to foster financial market growth, and sub-optimal intermediation services. Others are the weak financial markets, poor depth and inadequate liquidity of financial, poor advanced financial instrument necessary for the development and promotion of innovative financial instruments. Inadequate skills for financial products development, poor collaboration of regulators and stakeholder, insufficient investible fund for long term financial products, weak risk management, and physical insecurity and prevalence of financial fraud, as well as low level of financial literacy and inclusion, poor acceptance of mobile money at merchant location, and the non-existence of sound collateral management are other challenges confronting the financial markets development in Nigeria.

There have been unending and untimely policies initiated by the Apex Bank to enhance the effective and efficient performance of the financial sector, but instead of helping to solve the existing problems, new issues emerge. The Nigerian financial sector, like those of many other less developed countries, is highly regulated leading to financial disinter-mediation which retarded the growth of the economy (Kanu and Nwali, 2019). The link between the financial sector and the growth of the economy has been weak. The real sector of the economy, most especially the high priority sectors which are also economic growth drivers are not effectively and efficiently serviced by the financial sector.
These show that the Nigerian financial sector had been facing financial crisis and there is a need for further investigation to examine the component of the sectors and how it affects the economy of the country. This study examines the relationship between financial sector development and the growth of Nigeria economy. Specifically, the study provides answer to the questions: What is the effect of financial sector development indicators (financial deepening, stock market capitalization, and private sector credit) on economic growth in Nigeria? And what is the causal relationship between financial sector development and economic growth in Nigeria?
The study contributes to the finance-growth literature by focusing on the impact of financial sector development on economic growth, using emerging and frontier markets as a case study. The contribution here lies in the area in which aspect of the financial sector contributes to financial development in Nigeria.
This study is very important to policymakers, government and all stakeholders in the financial sectors. Once the direction of causality is determined, it is very important to understand the effect of financial development on economic growth. The findings of this study will help financial policymakers to understand and suggest reforms in the financial sector. The findings will be useful to the key players such as Central bank, Commercial Banks, Bureau of Statistics, in the industries to institute the local level reforms and policies which will help reduce the cost of acquiring information in the financial system.
The study investigates the relationship between Nigerian financial development and economic growth form 1980-2022 using Nigeria annual time series data. The choice of the period is

influenced by a series of changes in structure of Nigerian economy since 1980s because the country experiences some macroeconomic shocks due to volatility of global crude oil prices and political instability and rising insecurity. Also, during this period, macroeconomic variables like exchange rate, inflation, interest rate, among others fluctuated. Furthermore, Nigeria has witness changes in the financial sector that influence the performance of the sector, hence, the need to examine the economic impact of the financial sector within the study period. The financial sector indicators considered are financial deepening, market capitalization, and private sector credit.

The remaining of the study is structured into four sections. Section 2 presents the relevant literature review. The methodology and data are in Section 3. Findings of the study are considered in Section 4. Finally, Section 5 contains the conclusion of the study.

2. LITERATURE REVIEW

The theoretical relationship between financial development and economic growth dates back to Schumpeter (1961) who emphasized that the services provided by the financial intermediaries are important for innovation and development. This theoretical relationship was extended and developed further by Fry (1978, 1980) and Galbis (1977). The two studies analyzed the effect of government intervention on the development of the financial system. They proposed that government intervention to impose restrictions such as credit ceilings and high reserve requirements on the banking system can impact negatively on the development of the financial sector and thus on economic growth.

The initial thinking popularized by the work of Schumpeter (1961) was that the financial sector plays a significant role in influencing the course of growth via the provision of improved quality and quantity of financial services. These potential growth promoting services include, but are not exclusive to, the efficient mopping up of savings, effective monitoring of firms, exercise of necessary corporate governance, identification and allocation of investment to high return yielding ventures as well as risk hedging (Levine 2005).

On the other hand, Robinson (1979) argues that enterprise paves the way for financial advancement, thereby challenging the orthodox view. In her opinion, higher growth creates the impetus for heightened demand for diverse categories of financial services. Patrick (1966) emerged in-between suggesting that the finance–growth linkage fits better within a chicken and egg frame. There are two main views in the literature on the relationship between financial development and economic growth. The first one states that financial development has a positive effect on economic growth. According to this view, the effect runs from financial development to economic growth. This effect is caused either by an improvement in the efficiency of capital accumulation or an increase in the rate of savings as well as the rate of investment. This view is called supply-leading view, and was initiated by Schumpeter (1961) and supported by among others, King and Levine (1993) and Calderon and Liu (2003). The postulation of this view is that the causality runs from economic growth to financial development. An increase in real economic growth causes a rise in the demand for financial services and this result in the expansion of the financial sector. This means that financial development respond to economic growth. The demand-following view is supported by among others, Jung (1986) and Ireland (1994).

There are two other views between the supply-leading and demand-leading hypotheses (views). The first one postulates that there is mutual impact between financial development and economic growth. The second one is that there is no relationship between financial development and economic growth.

It has been assumed that the supply-leading view dominates the demand-leading view, which implies that financial development causes economic growth. However, a stage of development view was suggested by Patrick (1966). He argues that the causal relationship between financial development and economic growth depends on the stage of economic development. In the early stages of economic development, supply leading view can stimulates real capital formation. The development of new financial services creates new opportunities for savers and investors and causes an increase in economic growth. The supply-leading view become less important as financial and economic development proceeds and gradually, the demand-leading view starts to dominate. He states that one industry can be encouraged financially on the basis of supply-leading view, and when it develops, its financing shift to demand-leading view. Other industries that are still at a low level of development will remain in the supply-leading Phase.
Ideas and concepts surrounding financial deepening can be traced to the works of Keynes. In the Keynesian theory view, expansion in government expenditure in other to reach full employment necessitates financial deepening. When government increases its expenditure, aggregate demand will also increase alongside income, thereby raising demand for money. Disequilibrium situation occurs which can only be resolved through higher interest rate that forces decrease in private investment Gaffar (2014). Higher interest rate reduces private investment, and increase in government expenditure promotes investments and lower private investments concurrently. But McKinnon (1973) and Shaw (1973) disagree with this theory and came up with a rival hypothesis that depicts a positive relationship between interest rate and financial deepening. They opined that developing countries have repressed economies with ceilings on interest rates and limitations in credit availability which impose restrictions on growth (Divine et al., 2021).

Three basic relationships exist between financial deepening and economic growth. They are supply leading hypothesis, which believes that financial deepening impacts positively on the rate of development in every nations; the demand following hypothesis which states that finance responds to changes that occurs in the real sector of the economy and the Bi-directional causality hypothesis which is somewhere between the two other hypothesis and claims mutual impact of finance and growth (Divine et al., 2021). Financial deepening stimulates increased investment, economic growth and rising standard of living (Alrabadi & Kharabsheh, 2016). The higher the quantum of money supplies in an economy, the greater the chances for economic growth (Shaw, 1973).

Another theory that captures the influence of financial sector development on economic growth is the endogenous growth theory. The endogenous theory emphasizes the role of intellectual capital, grows through and technological progress in the growth of economy. The theory assumes intellectual capital grows through innovation and together with entrepreneurship form the primary drivers of economic growth.

The model posits that diminishing returns would finally cause economic growth to die down. The basic proposition of growth theory is that, in order to sustain a positive growth rate of output per capital in the long run, there must be constant advances in technological knowledge in the form of new goods, new markets, or new processes. In the growth theory, three factors are put forward, namely: labour growth, capital accumulation, and technical progress. The neo-classical growth theory expressed the sources of growth as consisting of the growth of labour force $g(L)$, growth of capital stock $g(K)$, and growth of productivity or technical progress. Constant returns are assumed for the growth, since the growth of capital stock also depends on national income, only technical progress and labour force growth determine output growth.

There exists a rich archive of literature on the relationship between financial sector development and economic growth. Ikhsan and Satrianto (2023) analyze the effect of financial development on economic growth high income countries. To support the results of this study, the variables used are financial development from the institutional and market side, as well savings and investment. Through the panel data method using the fixed effects model (FEM) approach. The results of study show that financial development has an effect on economic growth high income countries.

Ikubor et al. (2022) examined the impact of financial sector development on economic growth using selected banking sector variables such as broad money supply, total bank credits, total bank liabilities and private sector credits in Nigeria from 1981 to 2021. The results showed that the independent variables except private sector credit, had positive and significant relationship with real gross domestic product on the short-run and all the variables had significant impact on growth of the economy in the long-run with a speed of adjustment of 77.75%. Similarly, Dan'asabe and Mustapha (2023) investigates the relationship among development in financial sector, ratio of trade to GDP, and economic growth in Nigeria and established a long relationship with development in financial sector and trade openness impacting the economy positively. Gbarawae and Tonye (2024) examined the impact of liquidity ratio and non-performing loan on the growth of Nigerian economy and found that liquidity ratio accelerates the growth of the economy while non-performing loan is an impediment to economic growth in Nigeria. In an examination of the welfare impact of financial sector sector development in Nigeria, Osuji and Ekeagwu (2024) found that broad money supply brings about reduction in poverty, while private sector credit has no impact on poverty reduction.

Abbas et al. (2022) investigates the relationship between financial development and economic growth, using data from 44 countries. Results reveal that financial development contributes to economic growth in the long run. However, financial development tends to contributes more to economic growth in the upper-middle income countries. Omankhanlen et al. (2022) found that the market capitalization and ratio of money supply to GDP of the financial development have a bigger impact on the economic growth in Nigeria. In another regional study, Oyedele (2023) found that financial sector development as measured by domestic and external borrowing help improve the the population health status in sub-Saharan African by offsetting out-of-pocket expenditure, hence raising productivity. Also, Enemona et al. (2024) established the importance of financial sector indicators in the attainment of inclusive growth in 27 Sub-Saharan African countries. According to their findings, all financial indicators examined are catalyst in ensuring equitable growth benefits.

However, ratio of credit to the private sector to GDP of financial development is inversely not significant to economic growth in Nigeria.

Benmazou (2022) assess the nexus between financial development and economic growth in Mexico and found that the banking sector development has a positive impact on economic growth. Asafo-Adjei et al (2021) found positive bidirectional causality between the financial sector and economic growth in Ghana.

Albert et al. (2021) results indicate that real interest rate, and gross domestic savings are inversely related to GDP annual growth rate when combined, while domestic credit to the private sector is positively related to GDP annual growth rate.

Sharma and Kautish (2020) examined financial development and economic growth in middle-income countries in South Asia. The results of the study show that financial development has no significant effect on economic growth. Similarly, Kapaya (2020) conducted research in the Southern African Development Community (SADC) consisting of 16 countries and found that financial development is not effective in mobilizing financial resources for economic growth.

Kumar and Paramanik (2020) explored the connection between India's economic progress and its financial development and found a positive long-term financial effect on economic growth. Haguiga and Amani, (2019) studied the relationship between the development of the financial sector and the economic growth of Algeria during the period 2005-2014. The results showed a positive impact of the development of the financial sector in stimulating the economic growth. In addition to the existing literature on finance and economic growth revealed mixed relationship.
Although there is a vast literature that examine the relation between financial development and economic growth, only a few studies empirically examine the specific means by which the financial sector affects growth. A challenge for the studies in the field of innovation, growth and financial development is the empirical representation of innovation variables. These had led to contradictory results in different countries and regions. This study analyzes the Nigerian scenario by investigating the factors that are relevant in emerging economies like Nigeria.

3 METHODOLOGY

3.1 Theoretical Framework

The endogenous growth theory is the theoretical underlining for this study. Starting with the Solow model. The Solow model is an aggregate production function of the form:

$Y_t = f\left(K_t,\ A_t L_t\right)$ ……………………………………………………………(3.1)

Where: Y_t is output at time t, K_t is capital at time t, L_t is labour at time t and A is an index of technology or efficiency.
In endogenous growth theory, the growth rate depended on one variable: the rate of return on capital (Gillman *et al.*, 2002). Lucas on the other hand proposed the following production technology:

$Y = \mathrm{AK}^{\alpha}\left(\mathrm{l}hL\right)^{1-\alpha}$ ………………………………………………………………………..(3.2)

where Y, A, K and L denote output, technology, capital and labour, respectively and $0 < \alpha < 1$. while l is the fraction of an individual's time allocated to work, h is the skill level or human capital of the representative agent, and $\mathrm{l}h$ is the average human capital in the economy. The level of technology, A, is assumed to be constant (so that it could in principle be dropped from the expression or subsumed within the capital term).

3.2 Model Specification

Based on the theoretical framework discussed above, the econometric model for this study is developed as follows. $Y_t = A_t F\left(K_t,\ L_t\right)$ (3.3)

If we assume a Cobb Douglass function in the form of:

$\mathrm{Y} = \mathrm{A_t} K_t^{\propto} {}_t L_t^{\beta}$ (3.4)

Taking natural logs and differencing with respect to time we get the equation in growth rates. Equation 3.5 is the elasticity measures of physical capital and labor with respect to the growth rate of the economy.

$InY_t = \ln A_t + \alpha \ln K_t + \beta \ln L_t$ (3.5)

This model is used in studies attempting to analyze the determinants of economic growth.
Where, *Y* is output level, *K* is capital stock and *L* represent the labour stock. *A* is the total factor productivity, while φ and, β α are the coefficients.
This study adopt the econometric model of Acquah-Sam and Salami (2014) for Ghanaian data with modification.
The functional form of the model can be specified as follows:

Real Gross Domestic Product =*f*(Financial Deepening, Stock Market Capitalization, Inflation Rates, Real Exchange Rates, and Real Interest Rates) as shown in equation 3.6 :

$$GDP_t = f(FD_t,\ SMC_t, CM_t, RER_t, RIR_t, INR_t) \quad (3.6)$$

The mathematical form for the model can be expressed as:

$$RGDP_t = \beta_o + \beta_1 FD_t + \beta_2 SMC_t + \beta_3 CM_t + \beta_4 INF_t + \beta_5 RER_t + \beta_6 RIR_t \quad (3.7)$$

The study expresses the econometric form of the models as:

$$GDP_t = \beta_o + \beta_1 FD_t + \beta_2 SMC_t + \beta_3 CM_t + \beta_4 INF_t + \beta_5 RER_t + \beta_6 RIR_t + \mu_t \quad (3.8)$$

Where μ_t is the stochastic error term.

In order to properly estimate the parameters of the postulated models, we rescale some of the variables by logging them, as follow;

$$Log\left(GDP_t\right) = \beta_o + \beta_1 Log(FD_t) + \beta_2 Log(SMC_t) + \beta_3 Log(CM_t) + \beta_4 INF_t + \beta_5 RER_t + \beta_6 RIR_t + \mu_t \quad (3.9)$$

The stationarity properties of the data will be ascertained using the Augmented Dickey-Fuller (ADF) test, and the Phillips-Perron test. Autoregressive Distributed Lag (ARDL) model will also be conducted to examine the long run and short run relationship among the variables. Furthermore, the Toda and Yamamoto approach to Granger causality test will be used to determine the direction of causality between the variable. Finally, various diagnostic tests will be conducted.

In order to achieve the objectives of the study, this study employed Linear Autoregressive Distributed Lag (ARDL) and bound testing approach developed by Pesaran *et al*. (2001).

Starting with the Autoregressive Distributed Lagged (ARDL) approach, Variables are deemed to be cointegrated if there exists a stationary linear combination or long-term relationship among them.

The bounds test regression for the series in this study is specified as:

$$\begin{aligned}\Delta\left[LogGDP_t\right] = {} & \gamma_1 Log\left(GDP_{t-1}\right) + \gamma_2 Log(FD_t) + \gamma_3 Log(SMC_t) + \gamma_4 Log(CM_t) + \gamma_5 INF_t + \gamma_6 RIR_t \\ & + \sum_{i=1}^{k} \lambda_i \Delta Log(GDP_{t-i}) + \sum_{j=0}^{M} \psi_j \Delta Log(FD_{t-j}) + \sum_{r=0}^{N} \theta_r \Delta Log(SMC_{t-r}) + \sum_{q=0}^{P} \phi_q \Delta Log(CM_{t-q}) \\ & + \sum_{s=0}^{P} \pi_S \Delta(INF_{t-s}) + \sum_{v=0}^{P} \eta_v \Delta(RIR_{t-v}) + \varepsilon_t \end{aligned} \quad (3.10)$$

γ_1 *to* γ_6 are the long-run parameters while the short-run dynamics coefficients are explained by parameters $\lambda_i, \psi_j, \theta_r, \phi_q, \pi_S,$ *and* η_v, ε_t is the stochastic error term, normally distributed with zero mean, and constant variance, p is the optimal lag length.

The ECM model is specified as:

$$\begin{aligned}\Delta\left[LogGDP_t\right] = {} & \sum_{i=1}^{k} \lambda_i \Delta Log(GDP_{t-i}) + \sum_{j=0}^{M} \psi_j \Delta Log(FD_{t-j}) + \sum_{r=0}^{N} \theta_r \Delta Log(SMC_{t-r}) + \sum_{q=0}^{P} \phi_q \Delta Log(CM_{t-q}) \\ & + \sum_{s=0}^{P} \pi_S \Delta(INF_{t-s}) + \sum_{v=0}^{P} \eta_v \Delta(RIR_{t-v}) + \alpha ECM_{t-1} + \varepsilon_t \end{aligned} \quad (3.11)$$

Where Δ is the first difference operator, α measures the speed of adjustment back to equilibrium after a disturbance.

Lag orders have to be selected based on diagnostic tests for residual serial correlation, functional form misspecification, non-normality and heteroscedasticity (several information

criteria are available for this purpose, such as the Akiaike Information Criterion (AIC), the Schwarz Bayesian Criterion (SBC), the Hannan-Quinn Criterion (HQC) and the R^2 criterion). Pesaranet al. (2001) for the ARDL lag section Akiaike Information Criterion (AIC), show that the ARDL model yields consistent estimates of long-run coefficients under asymptotic normality.

This study employ Granger non-causality tests by using a modified Wald (MWALD) test proposed by Toda and Yamamoto (1995) to ascertain the causal relation. This procedure has been found to be superior to ordinary Granger-causality tests, since it ignores any possible non-stationarity or cointegration between the series when testing for causality. Their procedure involves the determination of d_{max}, the maximal order of integration of the series in the model (Ziramba, 2009). The underlying model of the causality test is intentionally over fitted with additional d max lags, so that the VAR order is now p= $d+d_{max}$, where d is the optimal lag order. This ensures that the usual t-statistics for Granger-causality have standard asymptotic distributions. The procedure utilizes a MWALD test statistic for the restrictions on the parameters of VAR(d), where k is the lag length in the system. The MWALD statistic has an asymptotic chi-square distribution when VAR ($d + d_{max}$) is estimated. To undertake Toda and Yamamoto's version of the Granger non-causality test, were present the population and economic growth model in the following VAR system:

$$\begin{pmatrix} \Delta\text{Log(FD)}_t \\ \Delta\text{Log(SMC)}_t \\ \Delta\text{Log(CM)}_t \\ \Delta\text{INF}_t \\ \Delta\text{RER}_t \\ \Delta\text{RIR}_t \end{pmatrix} = \begin{pmatrix} \emptyset_1 \\ \emptyset_2 \\ \emptyset_3 \\ \emptyset_4 \\ \emptyset_5 \\ \emptyset_6 \end{pmatrix} + \sum_{c=1}^{d} \begin{pmatrix} \theta_{1,1,c} & \theta_{1,2,c} & \theta_{1,3,c} & \theta_{1,4,c} & \theta_{1,5,c} & \theta_{1,6,c} \\ \theta_{2,1,c} & \theta_{2,2,c} & \theta_{2,3,c} & \theta_{2,4,c} & \theta_{2,5,c} & \theta_{2,6,c} \\ \theta_{3,1,c} & \theta_{3,2,c} & \theta_{3,3,c} & \theta_{3,4,c} & \theta_{3,5,c} & \theta_{3,6,c} \\ \theta_{4,1,c} & \theta_{4,2,c} & \theta_{4,3,c} & \theta_{4,4,c} & \theta_{4,5,c} & \theta_{4,6,c} \\ \theta_{5,1,c} & \theta_{5,2,c} & \theta_{5,3,c} & \theta_{5,4,c} & \theta_{5,5,c} & \theta_{5,6,c} \\ \theta_{6,1,c} & \theta_{6,2,c} & \theta_{6,3,c} & \theta_{6,4,c} & \theta_{6,5,c} & \theta_{6,6,c} \end{pmatrix} X$$

$$\begin{pmatrix} \Delta\text{Log(FD)}_{t-c} \\ \Delta\text{Log(SMC)}_{t-c} \\ \Delta\text{Log(CM)}_{t-c} \\ \Delta\text{INF}_{t-c} \\ \Delta\text{RER}_{t-c} \\ \Delta\text{RIR}_{t-c} \end{pmatrix} + \sum_{e=d+1}^{d_{max}} \begin{pmatrix} \theta_{1,1,e} & \theta_{1,2,e} & \theta_{1,3,e} & \theta_{1,4,e} & \theta_{1,5,e} & \theta_{1,6,e} \\ \theta_{2,1,e} & \theta_{2,2,e} & \theta_{2,3,e} & \theta_{2,4,e} & \theta_{2,5,e} & \theta_{2,6,e} \\ \theta_{3,1,e} & \theta_{3,2,e} & \theta_{3,3,e} & \theta_{3,4,e} & \theta_{3,5,e} & \theta_{3,6,e} \\ \theta_{4,1,e} & \theta_{4,2,e} & \theta_{4,3,e} & \theta_{4,4,e} & \theta_{4,5,e} & \theta_{4,6,e} \\ \theta_{5,1,e} & \theta_{5,2,e} & \theta_{5,3,e} & \theta_{5,4,e} & \theta_{5,5,e} & \theta_{5,6,e} \\ \theta_{6,1,e} & \theta_{6,2,e} & \theta_{6,3,e} & \theta_{6,4,e} & \theta_{6,5,e} & \theta_{6,6,e} \end{pmatrix} X$$

$$\begin{pmatrix} \Delta\text{Log(FD)}_{t-c} \\ \Delta\text{Log(SMC)}_{t-c} \\ \Delta\text{Log(CM)}_{t-c} \\ \Delta\text{INF}_{t-c} \\ \Delta\text{RER}_{t-c} \\ \Delta\text{RIR}_{t-c} \end{pmatrix} + \begin{pmatrix} v_{1,t} \\ v_{2,t} \\ v_{3,t} \\ v_{4,t} \\ v_{5,t} \\ v_{6,t} \end{pmatrix} \quad (3.12)$$

The Toda and Yamamoto (1995) procedure has an advantage in that it does not require precise knowledge of the integration properties of the system. It can be applied even when there is no integration or stability, and when rank conditions are not satisfied so long as the order of integration of the process does not exceed the true lag length of the model (Toda and Yamamoto, 1995)

4. RESULTS AND DISCUSSION OF FINDINGS

4.1 Descriptive Statistics

It is necessary to examine the descriptive characteristics of the variables used in this study. The descriptive statistics of the variables is presented in Table 2.

Table 1. Descriptive Statistics of Variables

	GDP	FD	SMC	INF	RIR	RER
Mean	2.02E+11	0.151478	47540.08	18.94905	0.453578	147.0349
Maximum	5.47E+11	0.251553	161995.4	72.8355	18.18	536.8903
Minimum	2.78E+10	0.091517	60.90511	5.388008	-65.8572	49.74471
Std. Dev.	1.72E+11	0.051057	59952.35	16.65935	14.25917	115.8669
Skewness	0.612328	0.726335	0.789477	1.854175	-2.71748	1.945144
Kurtosis	1.756493	1.937508	1.93851	5.306552	12.91104	6.016974
Sum	8.29E+12	6.210582	1949143	776.9108	18.5967	6028.431
Observations	41	41	41	41	41	41

Source computed by the Authors

Table 1 above shows the descriptive statistics of the variables. The series have a total of 41 observations with six (6) time series variables namely Gross Domestic Product, Financial Deepening, stock market capitalization, inflation, real interest rate, and real effective exchange rate. The summary statistics showed the total sum of Gross Domestic Product over the time frame of this study is 8.29E+12 while the maximum and minimum values of GDP_t are 5.47E+11 and 2.78E+10 with the mean and standard deviation of 2.02E+11 and 1.72E+11 respectively. Also, the total sum of Financial Deepening over the time frame of this study is 6.210582 while the maximum and minimum values of FD are 0.251 and 0.0915 with the mean and standard deviation of 0.1514 and 0.051 respectively. In addition, the total sums of stock market capitalization and inflation, over the time frame of this study are 1949143 and 776.9108 respectively. Meanwhile the maximum and minimum values of SMC_t and INF_t are 161995.4 & 72.8355 and 60.91 & 5.388 respectively with the means and standard deviations of 47540.08 & 18.95 and 59952.35 & 16.65935 respectively. Also, the total sums of real interest rate and real effective exchange rate (RER_t), over the time frame of this study are 18.510 and 6028.431 respectively. Meanwhile the maximum and minimum values of RIR_t and RER_t are 18.18 & 536.8903 and -65.86 & 49.745 respectively with the means and standard deviations of 0.454 & 147.035 and 14.26 & 115.867 respectively. All variables are positively skewed with the exception of RIR_t. However, GDP, FD, and SMC are not substantially different from the threshold of zero for a normal distribution. The kurtosis statistics showed that GDP, FD, and SMC are platykurtic, while INF, RIR, and RER are leptokurtic.

4.2 Time series properties (Stationarity Tests)

The unit root results is given in table 3 below.

Table 2 Unit Root Tests

Level						
Test/Variables	**GDP**	**FD**	**SMC**	**INF**	**RIR**	**RER**
ADF	-0.455259	-1.523850	0.584305	-3.009107	-7.477454	-2.112493
	(0.8892)	(0.5114)	(0.9874)	(0.0426)	(0.0000)	(0.2410)
First Difference						
Test/Variables	**LOGGDP**	**FD**	**SMC**	**RER**		
ADF	0.0012	-5.296749	-4.488516	-4.349927		
	(0.8892)	(0.0001)	(0.0009)	(0.0013)		

Source: computed by the author using E-views. Version 10 (2022)

The results of the unit root test in Table 2 above suggests that there is strong evidence that the null hypothesis of the presence of unit roots cannot be rejected in level form for four variables

namely Gross Domestic Product, Financial Deepening, stock market capitalization, and Real effective exchange rate with the exception of inflation and real interest rate which are stationary at level. In other words, the results suggest the series are mixture of different order of integration.

Also, the results suggests after differencing the series, the null hypothesis of non-stationarity in each of the series can be rejected at 1% level of significance. Thus, the series are now integrated of different order (1 I(1) and I(0),) These results suggest ARDL bound test is the ideal cointegration test. The ARDL can be used when the variables are a mixture of I(1) and 1(0) or the same level.

4.3 Testing for cointegration of the variables

Table 3 below presents the ARDL bounds testing approach to cointegration results for the model of effect of financial development on economic growth in Nigeria.

Table 3. ARDL BOUNDS TEST Results

Test Statistic	**Value**	**K**
F-statistic	6.437021	5
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.08	3
5%	2.39	3.38
1%	3.06	4.15
N=41		

Source: computed by the author using E-views (2022)

The F-statistics for this bound test is 6.4370, this is greater than the upper bound value of 4.15 at 1% significant level. Therefore, the null hypothesis of no long run relationship is rejected. Hence, this suggests that there is long-run relationship among Gross Domestic Product, Financial Deepening, stock market capitalization, inflation, real interest rate, and real effective exchange rate for the study period in Nigeria.

4.4 Effect of Financial Sector Development on Economic Growth in Nigeria

Table 4 below presents the ARDL regression estimates of variables. The table shows the long run coefficients, short run coefficients, and the diagnostic test results.

Table 4 Financial Sector Development Indicators and Economic Growth in Nigeria.

Dependent Variable: **LGGDP**

ARDL Long-Run Estimates

Variables	**Coefficient**	**S.E**	**t-values**	**P-Value**
FD	0.797160***	0.155031	5.141952	0.0006
LOGSMC	0.291973**	0.121818	2.396805	0.0401
RIR	0.546558**	0.186197	2.935379	0.0166
INF	-0.047079	0.041288	-1.140281	0.2836
RER	0.000135	0.003624	0.037293	0.9711

C	10.06790	1.705224	5.904149	0.0002

ARDL Short-Run Estimates

Variables	Coefficient	S.E	t-values	P-Value
Δ(FD)	0.435750**	0.107557	4.051345	0.0029
Δ(LOGSMC)	0.000494**	0.000203	2.441127	0.0373
Δ(RIR)	-0.008648***	0.001047	-8.262807	0.0000
Δ(INF)	-0.004888***	0.000814	-6.006413	0.0002
Δ(RER)	0.000236*	0.000110	2.142670	0.0608
ECT_{t-1}	-0.089717***	0.010353	-8.665943	0.0000

Diagnostic Tests	Statistic	P-Values
R-squared	0.946940	
Adjusted R-squared	0.872656	
Durbin-Watson stat	2.228881	
F-statistic	210.5037	
Prob(F-statistic)	0.000000	
X^2 Normal	0.000477	0.999761
X^2 Serial	0.124161	0.8851
X^2 ARCH	0.001243	0.9721
X^2 RESET	0.310141	0.5928

*Note: *** Statistical significance at the 1 per cent levels,**Statistical significance at the 5 per cent levels.*
**Statistical significance at the 10 per cent levels,*
Source: computed by the author using E-views. Version 10 (2022)

4.3.1 The long run coefficient results

The long run coefficient is presented in the first part of table 5. The FD, SMC, and RIR have statistically significant impact on GDP in the long run. The three variables have a positive significant impact on economic growth. The results suggest that a 1% increase in FD, and SMC, lead to 0.80% , and 0.29% ,increase in economic growth respectively. While a per cent increase in RIR lead to a 0. 54 per cent increase in the growth of the economy. The empirical results further revealed that inflation has a negative relationship with gross domestic product and the result statistically insignificant in the long run. This implies, over time, inflation has no predictive power on the growth of the economy. Meanwhile, real exchange rate has a positive and statistically insignificant effect on GDP.

An increase in the supply of money tends to lower interest rate (cost of borrowing) which leads to new investment, the demand for money increases, thereby stimulating spending. Firms respond by buying more raw materials and raise production. Also, firms demand for more labour, wages rise, workers become more productive, hence propel the growth of the economy. This aligned with the findings of Igwebuike et al. (2019) that found a positive relation between money supply and economic growth.

Theoretically endogenous growth theory suggests that stock market development causes higher economic growth through the influence on level of investment and productivity. Thus, the positive significant relationship between market capitalization and economic growth is in line with theory. This result conforms to the findings of Yakubu (2023) that reported a positive and

significant relationship between market capitalization and economic growth in Nigeria. It however, contradicts the work of Adamu and Mustapha (2023) that found a negative relationship between market capitalization and economic growth.

Interest rate being the cost of borrowing money is expected to have a direct effect on the economy through its effect on borrowing. Businesses, small-medium scale firms are expected to take out loans for investment when interest rate is low, hence, investment in turns lead to economic growth. This result tends to suggests otherwise – a positive relationship. This may be attributed to the complex relationship between interest rate and economic growth. Apart from the direct relationship through borrowing and investment, interest rate can influence the economy via indirect means by affecting the rate of inflation and exchange rate. Thus the management of interest rate by Central Bank may have an important impact on the economic growth of Nigeria. This finding contradicts the work of Igwebuike et al. (2019) and Albert et al. (2021) that found a crowding out effect of interest rate on investment.

The relationship between inflation and economic growth tends to conform to the argument that there is neither positive nor negative clear relationship between inflation and economic growth in developing countries like Nigeria. This can attributed to the extreme heterogenous nature of developing countries and the operations of factors other than inflation that might have more significant influence on the growth of the economy.

The positive signed and insignificant relationship between real exchange rate and economic growth is in agreement with the findings of Akpan and Atan (2011) that found no evidence of a direct relationship between real exchange rate changes and economic growth in Nigeria. The result conforms to the structural economist's view that there is an inverse relationship between exchange rate changes and economic growth in developing countries. This is owing to the fact that production in developing countries depend on importation of capital and intermediate goods, such that an increase in exchange rate increase the cost of production (imports) and thus affect the economy negatively. It however, contradicts the view of the traditional economists that suggest a positive and significant relationship between foreign exchange rate and economic growth.

4.3.2 The short run dynamics results

The error correction term is negative and statistically significant, which further confirms the cointegration tests and indicate a high speed of adjustment to equilibrium after a shock. The coefficient of CointEq (-1) is -0.09, which implies that, ceteris paribus, about 10% of the previous year's deviation from long run equilibrium will be corrected within a year.

The financial deepening, market capitalization, real interest rate, inflation, and real exchange rate have a significant relationship with economic growth. The variables have the same coefficient sign with the long run coefficient except for real interest rate that is negatively signed. Though, inflation, and real exchange rate are not statistically significant in the long run, they have a significant relationship with economic growth in the short run.

4.3.3 Diagnostic test results for the models estimated

In order to test the adequacy of the models before and after the GATS periods, the following diagnostic tests were conducted: Jarque-Bera (normality) test, Breusch-Godfrey LM test (serial correlation), the ARCH test (heteroscedasticity) and the Ramsey RESET test (functional form misspecification).

The normality result shows that with the JB-statistic (X^2) of 0.000477 which is statistically insignificant at 5% given the probability value of 0.999761 is greater than 0.05, this implies

that we do not reject the null hypothesis of normality and therefore conclude that the error terms are normally distributed at 5% level of significance.
The result of the Breusch-Godfrey (BG) general test of autocorrelation shows that with F-statistics of 0.124161 which is statistically insignificant at 5% given the probability value of 0.8851 is greater than 0.05, this implies that we do reject the null hypothesis of no serial correlation. Hence, we conclude that there is no serial correlation associated in the model.
In addition, the Autoregressive Conditional Heteroskedasticity (ACH) test to test if the error terms are homoskedastic gave results that showed an F-statistics of 0.001243 which is statistically insignificant at 5% given that the probability value of 0.9721 is greater than 0.05. This implies that we do not reject the null hypothesis of constant variance of the error term and conclude that there is no presence of Heteroskedasticity in the model.
The test of misspecification using Ramsey RESET tests was also carried to test if the model is correctly specified. From the results gave the F-statistics of 0.310141 which is statistically insignificant at 5% given the probability value of 0.5928 is greater than 0.05, this implies that we concluded that there is no specification error. This confirms that the model is well specified. Thus, the model is reliable and can be used for economic policy formulation, forecasting and prediction.

The stability test is an important test to check if the ARDL model which is estimated is stable. Using the cumulative sum of recursive residuals test and cumulative sum of squares the study established the stability of the model (Figures 4.1 and 4.2).

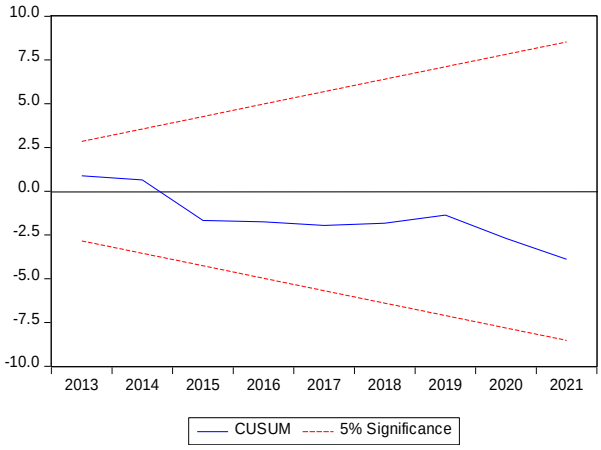

Figure 4.1. CUSUM

The stability of the ARDL bounds testing estimates which is investigated using the CUSUM and CUSUMsq tests gave results that are shown in Figs 4.1 and 4.2. The plots of the CUSUM statistics are well within the critical bounds at 5%.
The plots of the CUSUM of squares statistics are slightly within the critical bounds at 5%. This confirms that the ARDL estimates are reliable and consistent.

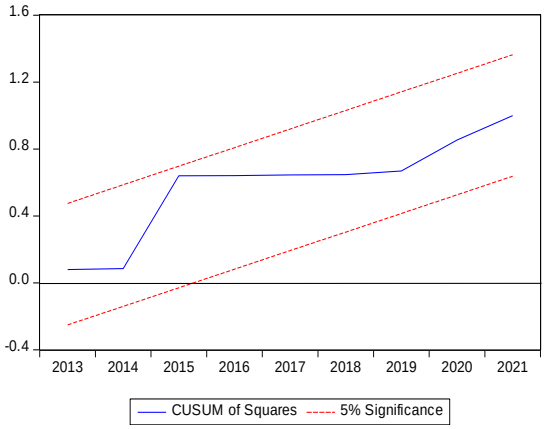

Figure 4.2. CUSUM of Squares

The tests find coefficients to be stable since the cumulative sum (blue lines) does not go outside the area between the two critical bounds (red lines).

4.4 Causal Relationship between Financial Sector Development and Economic Growth in Nigeria.

The Toda and Yamamoto (1995) technique was employed to test the causality among the variables in the system. The results are reported in Table 5 below

Table 5 Toda and Yamamoto Causality Result

Variables	MWALD statistic	P-Values
LOGGDP-FD	5.917131	0.2054
LOGGDP-LOGSMC	15.09131	0.0045
LOGGDP-RIR	17.58784	0.0015
LOGGDP-INF	8.049128	0.0898
LOGGDP-RER	11.72747	0.0195
All	53.90205	0.0001
FD-LOGGDP	5.142812	0.2730
FD-LOGSMC	1.120124	0.8911
FD-RIR	1.422159	0.8403
FD-INF	2.563777	0.6333
FD-RER	0.713130	0.9497
All	11.59297	0.9294
LOGSMC-LOGGDP	0.749624	0.9451
LOGSMC-FD	3.189073	0.5267
LOGSMC-RIR	1.706957	0.7895
LOGSMC-INF	1.400591	0.8441
LOGSMC-RER	1.490423	0.8283
All	23.94438	0.2448
RIR-LOGGDP	15.20847	0.0043
RIR-FD	2.364075	0.6691
RIR-LOGSMC	5.926164	0.2047
RIR-INF	8.285117	0.0817
RIR-RER	3.659502	0.4540
All	53.44914	0.0001
INF-LOGGDP	6.262100	0.1804
INF-FD	5.328268	0.2552
INF-LOGSMC	1.259034	0.8683
INF-RIR	3.365565	0.4986
INF-RER	9.500075	0.0497
All	36.45745	0.0136
RER-LOGGDP	3.940194	0.4142
RER-FD	9.900794	0.0421
RER-LOGSMC	1.613571	0.8064
RER-RIR	6.339073	0.1752
RER-INF	12.37721	0.0148

All	97.73023	0.0000

****, ** and * denote the significance at 1%, 5% and 10% respectively.*
Computed by the author using E-views, Version 10 (2022)

T-Y Granger non-Causality has been conducted to determine the causal relationship among the variables in this study. The result of the significance of the p-values of the MWALD statistic indicates that there is unidirectional causality running from Gross Domestic Product to stock market capitalization, real exchange rate, and inflation. There is bidirectional causation between Gross Domestic Product and real interest rate in Nigeria. However, there is no causal relationship between gross domestic product and financial deepening in Nigeria. This tend to suggests overall that financial sector development is not a major determinant of economic growth in Nigeria. This contradict the endogenous growth theory that suggests that stock market development causes higher economic growth through the influence on level of investment and productivity. This may be associated to the influence of other factors that influence the relationship between financial market and economic growth.

Surprisingly, the result suggests that economic growth leads to stock market capitalization and not the other way round. This implies a vibrant economy is needed to grow the financial sector in Nigeria. The bidirectional causation between Gross Domestic Product and real interest rate in Nigeria suggests interest rates and economic growth are closely related and have a significant influence on each other. In addition, the result shows that Financial Deepening does not cause any of the variables in the system. Furthermore, stock market capitalization does not granger causes any of the variables in the system and there is no feedback from stock market capitalization to other variables in the system.

There is a bidirectional relationship between real interest rate and real effective exchange rate. Likewise, causation runs from real effective exchange rate to financial deepening and inflation in Nigeria.

5. CONCLUSIONS

The study concluded that financial deepening has both short-run and long-run impact on economic growth in Nigeria. Therefore, financial sector development tends to influence the growth of economy in Nigeria.

The positive significant relationship between market capitalization and economic growth validates the endogenous growth theory which suggests that financial market growth causes higher economic growth through the influence on level of investment and productivity.

Interest rate being the cost of borrowing money is expected to have a direct effect on the economy through its effect on borrowing. Businesses, small-medium scale firms are expected to take out loans for investment when interest rate is low, hence, investment in turns lead to economic growth. This result tends to suggests otherwise – a positive relationship. The relationship between inflation and economic growth tends to conform to the argument that there is neither positive nor negative clear relationship between inflation and economic growth in developing countries like Nigeria.

The positive and insignificant relationship between real exchange rate and economic growth conforms to the structural economist's view that there is an inverse relationship between exchange rate changes and economic growth in developing countries. It however, contradicts the view of the traditional economists that suggest a positive and significant relationship between foreign exchange rate and economic growth.

Government should put in place policies and provide incentives for the continuation of the financial sector development for growth of the economy. Likewise, growth of the economy will make demand for financial services leading to financial sector development; economic

growth and financial development are inter-reliant. Enhancing integration with the external financial market should be at the core of the financial sector development strategies. This will impact on the overall financial sector development thereby increasing economic growth. Since Nigeria financial sector is dominated by the banking sector, the financial sector has to deepen by strengthening the banking sector so as to maintain a sustainable economic growth. It can be strengthened by having a strong regulatory system that strengthens the private sector as it is the engine of economic growth

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