Acta Universitatis Danubius
ŒCONOMICA

Financial Economics

Interest Rate Behaviour and Nigerian Financial Sector Growth: A Relationship Analysis

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Abstract: The behavioral effect of interest rates was investigated in this study. From secondary sources, the study collected quantitative data from 1987 to 2020. The modeled the growth of the financial sector, proxy by the real Gross Domestic Product of the sector as a linear function interest rate, proxy by lending interest rate, deposit interest rate, monetary policy rate and treasury bill rate. Furthermore, as the Philip-Peron approach to unit root test revealed that the variables were integrated of I(0) and I(1), Autoregressive Distributed Lags model was specified and estimated with conitegration bound test which reveled evidence of long run relationship among the variables. The result showed that lending interest rate, with coefficient -0.1391LIR and p-value = 0.0268<0.05 was the most significant influencer of the growth in the financial sector while deposit interest rate with -0.0076 coefficient and p-value = 0.7410>0.05, monetary policy rate with 0.0077 coefficient and p-value = 0.2626>0.05 and treasury bill rate with -0.3533 coefficient and p-value = 0.4889>0.05 were not weak in influencing the growth of the financial sector in the long run, although the relationships exhibited by these variables differs slightly in the short run. in addition, the error correction mechanism revealed that any temporary deviation from the equilibrium experienced by the interest rate proxies adjusted quickly to the equilibrium in the long run at the speed of 35%. Also, the post-estimation test revealed that the residuals were homoscedastic while the autocorrelation test revealed that the residuals were uncorrelated. Hence, the study concluded that lending interest rate was a significant determinant of the growth in the financial sector and recommended that since th financial sector is deregulated already, lending interest rate should be naturally allowed to be dictated by the market forces of demand and supply rather than being artificially fixed by the banks which often take advantage of this to extort customers; this will weaken the current significant negative effect which lending rate has on the growth of the financial sector.

Keywords: Interest rate; financial sector; growth; long-run

JEL Classification: E43

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1. Introduction

It is generally believed that the backbone of any economy is finance. Also, finance is a core function or service usually provided by the financial institutions that make up the financial sector of the economy. In other words, financial sector is like an umbrella under which all the financial service providers operate. It thus means that financial sector is a sector that comprises all the licensed financial institutions operating to provide finance and other ancillary services to the financial consumers. In Nigeria, the financial sector is very critical to the growth of the economy since hardly can any productive activity take place without the provision of adequate finance by the financial institutions that make up the financial sector; mobilization of funds to various productive sectors of the economy such as industry, agriculture, mining, manufacturing, transportation, etc. is made possible by the operators in the financial sector.

By mobilizing financial resources to other sectors of the economy, financial sector facilitates economic growth in the long run. Moreover, it is worthy of emphasis that the critical nature of the financial sector in supporting Nigerian economy is underscored by the seriousness placed on its regulation and supervision by the various financial and monetary regulators, such as Central Bank of Nigeria, Nigeria Deposit Insurance Corporation, etc. all in a bid to ensure soundness in the operations of the sector and prevent abuse by the stakeholders in the sector. Consequently, it can summarily be posited that the fall of the financial sector, is the fall of all other sectors of the economy. It is however; worrisome that in the last five years, the annual contributions of the Nigerian financial sector to the Gross Domestic Product has been stagnantly 3%. Specifically, between 2015 and 2019, the financial sector' annual contributions to GDP are 3%, 3.8%, 3%, 3%, and 3% respectively, according to CBN's Statistical Bulletin (2019).

This untoward stagnancy is unexpected of a critical sector like the financial sector and hence, the clogs in the wheel of the growth of this sector deserve empirical investigation. Majorly, the rewards for financial services and products provided by the financial sector are in form of interests, which are usually a percentage determined largely by the monetary authorities via Monetary Policy Rate (MPR) as well as the market demand and supply of money. These interest rates behaves and reacts differently depending on the economic vagary; hence, sometimes, it can be as low as 0.1% and as high as 100%, depending on the nature of the financial contract involved. Hence, Alaba (2002) as cited in Adetokun, Abdulkamaru and Pam (2021) opined that interest rate has the aptitude of intensifying or diminishing lending behaviour of banks. This is expounded in the variation between the lending rate and deposit rate denoted as interest rate spread. Therefore, for DBMs to remain in business, Interest rate spread which facilitates the generation of sufficient revenue to cover their marginal cost and other associated costs of running day-to-day business has to be stimulated. With this

in sight, Mirzaei, Moore and Liu (2003), opined that emerging banks can stimulate their profit through interest rate spread.

Given that interest rate is never stable, even under direct credit allocation regime. Thus, over the years, interest rates have remained a subject for critical assessment with diverse implications for savings mobilization and investment promotion. Generally, interest rates are the rental payments for the use of credit by borrowers and return for parting with liquidity by lenders (CBN, 1997).

Moreover, interest rate, according to Udoka (2012) was fully deregulated in 1986 but reversed in January, 1994 when lending interest rate was pegged at 21% per annum and deposit interest rate pegged at 12% per annum. Full deregulation of interest rates again took place in October, 1996 which gives freedom to banks to, in consultation with their customers; determine the structure of the interest rate. The Central Bank however, did not give up its discretionary power to intervene when necessary in the money market to ensure orderly behaviour of interest rates. This full deregulation of interest rates has been operating since 1997 till date. In line with the submission of Francis (2019) as cited in Adebayo and Udofu (2021), although, interest rate in Nigeria is still indirectly regulated using officially apparatus, the banks are under deregulation regime. In effect, the direction of interest rates in Nigerian deposit money banks is still largely determined by the Monetary Policy Rate which is under the control of Central Bank of Nigeria (CBN), such that a higher MPR connotes high interest rate and vice versa (Francis, 2019).

Thus, the monetary policy rate (MPR) is the official interest rate of the Central Bank of Nigeria (CBN), which anchors all other interest rates in the money market and the economy. Meanwhile, over the years, the MRR/MPR, which is the baseline rate on which other ruling interest rates in the economy is built, has never been stable, rather it has been reduced, increased, reduced and increased; to this extent, Olurounbi (2020) reports that Nigeria, in an efforts to support the economy through provision of cheaper credit, reduces its Monetary Policy Rate (MPR) to 11.50% from 12.50%. However, Emejo and Ekeghe (2022) reports that Monetary Policy Committee (MPC) of the Central Bank of Nigeria, after maintained constant Monetary Policy Rate constant at 11.5% for around two and a half years, increased the benchmark interest rate from 11.5% to 13%, adducing this step to inflationary pressures ravaging world economically; and raised it again to 14% in July 2022, citing same reason (Olawoyin, 2022). Hence, the investigation of the interest rates behaviour on financial sector performance as carried out by this study is apt in the wake of the current happenings in the economy.

1.2. Statement of the Problem

Interest rate is a variable of interest to all stakeholders in the financial sector because it determines their earning potentials and critical to their investment decision making. In other words, policy makers, investors, financial advisers, debtors, creditors, etc. are always looking up to the direction of interest rate before making the next move. Consequently, researchers have been attracted to the dynamism of interest rate and its effects have been subjected to empirical investigations over the years. However, despite the importance of interest rate to the financial sector, the direction of the existing studies have been projected excessively towards measuring the effect interest rates on the aggregate economy and disaggregated economy to the exclusion of financial sector (Udoka, 2012; Okoye, Nwakobi and Modebe, 2015; Igbodika and Chukwunulu. 2016; Nwandu, 2016; Ekwueme & Odirin, 2015). Furthermore, majority of other scholars that have also measured the effects of interest rate have done that in relation to the performance of the banking sector alone which is a sub-sector of the financial sector. For instance, Ilugbemi, (2020), Olajide, Asaolu and Jegede (2011), Okoye and Eze (2013), Ndubuaku, Ifeanyi, Eze and Onyemere (2017) and Enyioko (2012) are few of the scholars that have subjected the effect of interest rate on banks' performance to empirical investigations. In addition, in the previous studies, estimated models have not captured the effect of treasury bill rate which is another critical rate that determine the earnings and investment patterns of the financial sector in Nigeria; although Ilugbemi (2020) and Ogunbiyi and Ihejirika (2014) considered treasury bill rate in his study, the focus of the study was on bank performance and not the entire financial sector. Worse still, interest rate, and by implication, financial sector was totally and finally deregulated in Nigeria in 1986, yet no studies have examined the effect of interest rates on the financial sector within the period of this complete deregulation. From the foregoing therefore, it is obvious that the effect of interest rate with respect to the entire financial sector has not been deservedly justified; this thus constitutes a lacuna in the literature, which the present study is poised to fill. Unless this lacuna is filled up, it would be difficult to unfold the contribution of the interest incomes which accrue to the financial institutions to the growth of the financial sector. Furthermore, interest rate behaves differently in response to monetary and fiscal policy of the government as well as the demand for and supply of credit; hence interest rate rises and falls and this triggers different reactions from the borrowers and other economic agents, and consequently affect the earnings in the financial sector. All these would impact the performances of the financial institutions that make up the financial sector and affect the overall growth of the sector. These impacts must be therefore, be revealed so as to enhance the quality of decision making by the various stakeholders and policy makers in the financial sector and to enrich the literature by contributing to existing knowledge.

1.3. Research Questions

Sequels to the statement of the problem, the following questions are raised:

i. What is the effect of lending interest rate on the financial sector growth in Nigeria?

ii. How does deposit interest rate affect the financial sector growth in Nigeria?

iii. What is the effect of monetary policy rate on the financial sector growth in Nigeria?

iv. How does Treasury Bill rate affect the financial sector growth in Nigeria?

1.4. Objectives of the Study

The overarching objective of this study is to examine the effect of interest rate behaviour on the financial sector growth in Nigeria; in addition to the main objective, specific objectives of the study are to:

i. examine the effect of lending interest rate on the financial sector growth in Nigeria

ii. investigate the effect of deposit interest rate affect the financial sector growth in Nigeria

iii. assess the effect of monetary policy rate on the financial sector growth in Nigeria

iv. find out how treasury bill rate affect the financial sector growth in Nigeria?

1.5. Research Hypotheses

In line with the objective earlier stated, the following hypotheses are conjectured to guide the conduct of this study:

i. **$H0_1$**: Lending interest rate has no significant effect on the financial sector growth in Nigeria

ii. **$H0_2$**: Deposit interest rate has no significant effect on the financial sector growth in Nigeria

iii. **$H0_3$**: Monetary policy rate has no significant effect on the financial sector growth in Nigeria

iv. **$H0_4$**: Treasury bill rate has no significant effect on the financial sector growth in Nigeria

2. Literature Review

2.1. Conceptual Review

This study provides a review of some basic underlying concepts to the focus of this study as follows:

2.1.1. Interest Rates and its Dimensions

Gilchris, (2013) states that although it is difficult to determine the direction of the relationship between interest rates and profitability, studies confirm that interest rates instability affects Commercial Banks' financial performance while other studies give contradictory findings. The Central banks also lends Commercial Banks funds. Money borrowed from the Central Bank is to be repaid at a particular interest rate (Monetary Policy Rate). This makes interest rate a powerful government regulatory tool for determining other interest rates in the banking industry. Hualan (1992) stated that interest rate is one of the most important factors that affect the bank financial performance. Corb (2012) argued that interest rate is an economic tool used by the Central Bank to control inflation and to boost economic development. Ngugi (2004) explains that low interest rates and small spread promote economic growth in big ways hence encouraged.

Crowley (2007) and Ngure (2014) see interest rates as the price a borrower pays for the use of money they borrow from a lender (financial institution) or fee paid on borrowed assets. Sayedi (2013) expressed interest rate as the percentage rate over a period of one year. Karl et al., (2009) posits that interest rates are derived from macroeconomic factors which agree with Irungu (2013) that interest rates are major economic factors that influence the economic growth in an economy. Inflation and inflationary expectations can press interest rate upward which affects lending rates resulting to reduce credit demand and lending ability of commercial Banks (Keynes, 2006). Account given by Irungu (2013) portrays interest rate as the price of money. Interest rates can either be nominal or real. Nominal interest rate can be measured in naira terms, not in terms of goods. The nominal interest rate measures the yield in naira per year, per naira invested while the real interest rate is corrected for inflation and is calculated as the nominal interest rate minus the rate of inflation (Pandey, 1999).

Anyanwu (1997) as cited in Okoye and Eze (2013) believes that interest rate is the amount of interest paid per unit of time expressed as a percentage of the amount borrowed. The cost of borrowing money, measured in naira, per year per naira, borrowed, is the interest rate. He further submits that interest rates differ mainly in term/maturity because when maturity and liquidity together with other factors are considered, many different financial instruments and so many different interest rates will emerge

Another useful insights on interest rate was provided by De Angelis, Aziakpono and Faure (2005) as cited in Igbodika and Chkuwununu (2016) that interest rates play a

crucial role in the efficient allocation of resources aimed at facilitating growth and development of an economy and acts as a demand management technique for achieving both internal and external balance with specific attention to deposit mobilization and credit creation for enhanced economic development.

From the foregoing views of scholars, it can be inferred that the authors unanimously agree that interest rate is very pivotal to the operations of the financial institutions and their survival is hanging upon and going concern status depends largely on their ability to price their various products effectively and efficiently using interest rate. This translates that financial institutions must not charge too much price (interest rate) for their products as this can scare away potential customers and investors and lead to loss of substantial businesses and the accompanying interest incomes that otherwise would have been made on those business to competitors. If on the other hand, too low interest rate is charged, revenues in form of interest incomes might be lost and this will negatively impact the performance of the financial intermediaries. Hence, operators in the financial sectors must strike a reasonable balance between 'too high' interest rate and 'too low' interest rate, subject to the base lending rate (Monetary Policy Rate).This is adduce to why this study is crucial as the outcome will show the reactions to the dynamism of interest rate by the operators in the financial sector.

2.2. Monetary Policy Rate

In Nigeria, the discount rate is the Minimum Rediscount Rate, which, in order to make it a more functional tool to moderate market rates, has now been replaced with Monetary Policy Rate since December 2006, and it shall hence serve as the anchor for determining other rates (Sanusi, 2004). Moreover, according to CBN (2016), monetary policy refers to the specific actions taken by the Central Bank to regulate the value (quantity), supply (availability) and cost of money in the economy with a view to achieving government's macroeconomic objectives. One of the ways of channeling monetary policy is through monetary policy rate, which is the CBN's official interest rate on which other interest rates are predicated both in the money market and in the economy. Each time CBN tinkers with MPR, the price mechanisms in the country as well as other economic activities are affected through some channels. Hence, Coronation Research (2021) corroborates that any pronouncement on MPR affects the public expectation and confidence as well as the expectations of the various economic agents concerning the future bearing of the economy. Equally, any move made by CBN in respect of MPR influences prices of shares and other financial assets, exchange rate among countries' currencies, including saving and spending capability of economic agents and the public. Interestingly in the last decade, MPR has been jingling between 9.25% and 14%, while as at the time of conducting this study, it stands at 11.5% (CBN, 2021). MPR critical is thus critical to the focus of this study as it is one of the variables to measured in order to achieve the objectives of this study;

it has been as posited by Igbodika and Chukwunulu (2016) that higher monetary policy rate and saving rate impliedly reduce the standard of living by affecting the cost of borrowing from financial institutions.

2.3. Lending Interest Rate

The rate at which the financial institutions grant credit to their numerous customers is known as lending interest rate. This rate, according to CBN (2016) can be divided into two, namely: prime lending rate and maximum lending rate. While prime lending rate is the rate at which credit is granted by DBMs to their customers that are most credit worthy, and it also called the minimum rate on which other lending rates in different sectors can be predicated. Maximum lending rate on the other hand refers to the rate at which low credit-rating customers enjoy credits from the DMBs. Corroborating the position of CBN, Kagan (2020) explains that lending interest rate is usually expressed as percentage of amount lent to borrower and it constitutes an income in the hand of the lender. He concludes that interest rates can vary depending on the type of financing being procured and the borrower's creditworthiness. Also, from the view of expressed by Finan (2016), interest rate is the cost of obtaining credit in an economy which is the price charged on annual basis by the creditors (financial institutions in this case) on fund provided for the debtors. Consequently, CBN (2016) affirms that increase in lending interest rate discourages borrowing (and lower interest incomes) and consequently slow down economic growth by reducing economic activities.

Low interest rate however, encourages borrowing and promotes economic growth because more profits are made by businesses which pay only a small portion of their profits as finance cost. Hence, if all other things are equal, low interest rate should higher profit margin and vice versa. Obamuyi, (1999) opines that lending rate means the rate at which the financial institutions grant credit to their customers, and such rate is inclusive of cost of fund, maturity nature of the borrowing, the risk involved (actual or perceived), bank profit margin and CBN’s regulation. Abimbola (2020) concludes that some analysts believe that although interest rate reduction should on paper, lower the interest rate on bank loans and spur lending to businesses; the anxiety about the weak state of the Nigerian economy will frustrate the efforts of the CBN to achieve the desired result eventually. Consequently, lending interest rate, being a major source of revenue to the operators in the financial sector, is measured in this study with respect to the performance of the sector.

2.4. Saving Interest Rate

This is otherwise called deposit interest rate. Saving interest rate is another important variable that is crucial to achieving the objectives of this study, and it is usually part of the factors to be considered in fixing market lending interest rate. Thus, Ogege

(2019) sees saving interest rate as the cost incurred by the deposit financial institutions on deposit mobilized and it determines the cost of lending mobilized deposits. Hence, the higher the saving interest rate, the higher the lending interest rate is most likely to be, and vice versa. This interest rate affects savings because should the interest rate on savings be found encouraging, individuals would be motivated to save idle fund more and this connotes expansion in the loanable funds available to finance economic activities that can enhance economic growth. In the context of determining the performance of the financial sector, increase in this rate makes savers earn more interns of returns on their savings and the reverse is the case for the financial institutions which have to pay more on deposits received. However, the more cost incurred by the financial institutions on increase in saving deposit rate is offset on the long run by more earnings from the expanded lending base of the deposit taking spurred by increase in deposit rate as they are empowered them to lend more due to influx of mor deposits in the quest to earn more interest; Meanwhile, the CBN had recently reduced the interest rate on savings deposits to a minimum of 10% annually as against previous 30% annual rate of the MPR with the aim of facilitating supply of money by the financial institutions and boost spending power (Olurounbi, 2020). The difference between lending rate and deposit rate is the interest rate spread. The interest rate spread is the core savings-investment process and measures of efficiency of the financial institutions in the intermediation process between savers and borrowers. (Igbodika & Chkuwununu, 2016) Similarly**,** while clarifying the divergence of lending and deposit interest rate, Okoye, Nwakobi and Modebe (2015) enunciate that deposit rate is the return that accrues to fund owners (the surplus economic units) for placing their funds at the disposal of the financial institutions while the lending rate is that which accrues to the financial institutions for making the mobilized savings available to borrowers. He concludes that the difference between the two rates, known as the spread, represents an income for the lending institutions.

2.5. Treasury Bill Rate

Treasury Bill is part of the short-term government guaranteed debts instruments which are usually purchased and sold in the money market to control the supply of money in the economy. Since purchasers or investors are expecting returns on their investments, the issuers of the bill are obliged to reward the investors on parting with the money for the tenor of the bills. Therefore, rate paid by the treasury bill issuing government or monetary authority is known as treasury bill rate (CBN, 2016). Also, since treasury bills are usually issued at a discount to their face values but mature at face values, the rates payable on them are proportional to their purchase prices, face values remaining time to maturity.

On the importance of interest rates, CBN (2016) submits that interest rate is very important because of the following roles it plays:

Interest rate influences the behaviour of the borrowing financial consumers: In Nigeria and other countries of the world, houses, health, businesses, cars and other valuable assets are usually financed with loans. To this extent, the lower the interest rate, the more the demands are made for loans for such purposes and other goods and services as this will mean that lesser parts of their incomes would be used to service the loans. The reverse of the foregoing is true in case of high interest rates. Interest rate also impacts the flows of capital: This is because due to high returns prospects, a country with high interest rate would be an attractive destination for foreign capital inflows and investments. The reverse will hold in case of low interest rate as people tend to shift or move out their capitals to other countries where interest is high due to low returns on investment at home.

Government deficit levels are equally impacted by interest rate: Generally, government finance most of their activities by issuing bonds and other forms of borrowings; high interest rate would connote that government borrowing securities would have to be issued at such high interest rate, there making the huge part of government revenues to be eroded by debt servicing and this would be blow up the deficit position of the government and impacts negatively on the economic growth.

2.6. Determinants of Interest rate behaviour in the Context of a Liberalized Financial Sector

Nigeria financial sector was liberalized in September 1986, thereby giving room for interest rate to be freely determined by the market forces as against sole discretion of the monetary authority. From the foregoing, Edirin and Ekwueme (2015) expound that the behavior of interest rates in Nigeria over the years can be traceable to some factors. Hence, Akingunola et al (2012) and Udoka & Anyingang (2012) view such factors to include the following among others:

i. The high rate of domestic inflation arising from the huge fiscal deficit of Federal Government which was financed mainly by Central Bank;

ii. The undue discretion which the deregulation of interest rates conferred on key market players in pricing their funds as well as the arbitraging activities of market speculators;

iii. Technical insolvency and serious cash flow problems on the part of some weak banks resulting in distress borrowing;

iv. The investment demand: The higher the level of investment demand, the higher the level of interest rates. Similarly, the lower the level of investment demand, the lower the level of interest rates;

v. The use of stabilization securities and the system of allocation of foreign exchange both of which induced the sterilization of large funds at the CBN;

vi. The demand for money or liquidity preference in addition to the quantity of money or money supply in the economy;

vii. The level of savings (or conversely, the level of consumption).

In addition to the above, Udoka (2012) equally sees the quantity of money or money supply as part of the determinant of interest rate behaviour, drawing his argument from the Keynesian proposition that as we increase money supply the interest rate will reduce. Furthermore, despite the liberalization of Nigerian financial sector, interest rate is yet subjected to management from time to time by the monetary authority.

2.7. Overview of the Nigerian Financial Sector growth

Even though many industries have been disrupted by the outbreak of corona virus, Nigeria's financial industry is one of the few that is less hit by the pandemic as the sector reported four-year high GDP growth in Q1 2020 (Okafor, 2020). Narrating the recent growth in the Nigerian financial sector, Okafor (2020) explained that analysis of the 2020 first-quarter GDP as reported by Nigerian Bureau of Statistics (NBS) revealed that the Financial and Insurance sector grew by 13.19% year-on-year in Q1 2020. The foregoing, according to him is from a contraction of 7.60% in Q1 2019; he explains further that the sector leveraged on contactless payment, increase in deposits and transactions to post a growth of 20.79% in the first three months of 2020, making it the fastest expanding sector in the reviewed quarter.

The Finance and Insurance Sector consists of the two subsectors that make up Nigerian financial sector. Okafor further revealed that while financial Institutions accounted for 87.02 %, insurance sub-sector accounted for 12.98% of the financial sector respectively in real terms in Q1 2020. The foregoing implies that the Financial Institution sub-sector alone was responsible for the largest part of the financial sector's growth as it reported a growth expansion by 33%. The insurance sector, on the other hand, recorded a marginal growth increase of 0.36 as it expanded from the 2.58 percent reported in Q1 2019 to 2.94 percent at the end of March 2020.

Furthermore, having recorded a GDP expansion of 24 percent in the first three months of 2020, Okafor submitted that Nigeria's financial institutions outperformed other sectors to emerge as the top-performing industry in Q1. A year-on-year comparison of the industry performance shows that the 24 percent GDP growth reported in Q1 2020 was 14.8% higher than the -9.21 recorded in the corresponding quarter of 2019. The sector expanded by -13.16 percent, 0.60%, and 12.58% in Q1 2016, Q1 2017 and Q1 2018 respectively (National Bureau of Statistics, 2020). Adducing reason for this impressive performance by the financial sector, Ayorinde (2020) argued that continued loan expansion by the banks in the first two months of the quarter before the Covid-19 pandemic in a bid to meet the CBN Loan-to-deposit ratio (LDR) requirement spurred the improved banks' performance. In this study therefore,

performance of the financial sector is measured by the real Gross Domestic Product of the sector.

2.8. Conceptual Framework

2.8.1. Independent Variables Dependent Variables

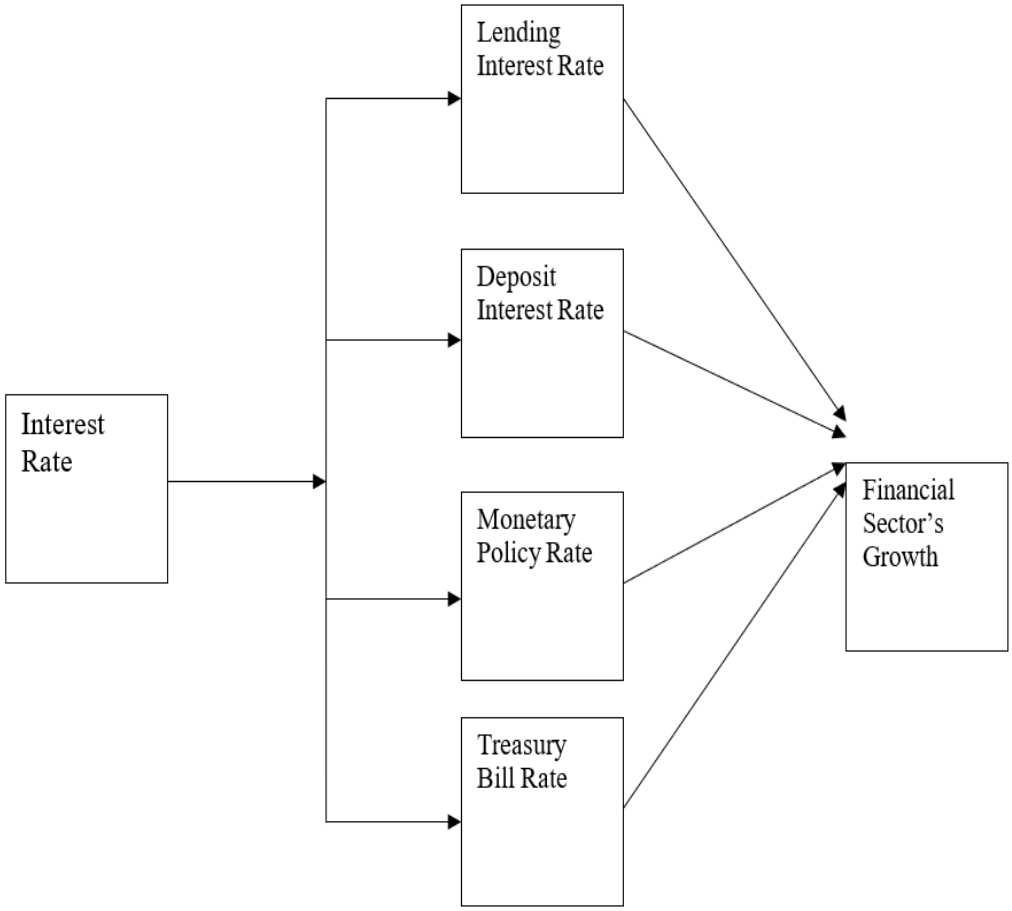

Figure 1. Relationship between Interest Rates and Financial Sector's Performance

2.9. Theoretical Framework

The Financial liberalization theory which was pioneered by Mackinnon (1973) and Shaw (1973) forms the bedrock of this study because it has justified that liberalized financial sector as in the case of Nigeria would cause efficient allocation of financial resources by the financial intermediaries (which are equally the financial institutions operating in the financial sector) as the market-determined interest rate encourages savings and investments and in turn produces improved growth (performance) in the overall economy which includes financial sector as its constituents. By implication therefore, liberalized financial sector spurs high interest rate and this encourages those with excess liquidity to save more with the financial institutions; through this, the financial institutions would be able to lend more to productive investments (and earn more income in form of interest). The foregoing, as advocated by this theory produces improved performance of the financial sector in terms of increase in interest earnings and by extension, overall productivity. By implications, the theory affirms a direct and linear relationship between the interest rate and the growth of the financial sector.

2.10. Empirical Review

Ogunbiyi and Ihejirika (2014) examined the Nigerian experience of the effect of interest rate on profitability of deposit money banks in Nigeria from 1999 to 2012. Returns on asset and return on equity were the dependent variables to measure banks' performance while Real interest rate monetary policy rate, Prime lending rate, Savings deposit rate, T-bills rate and Inter-bank rate were the independent variables. Secondary data were collected from the Central Bank of Nigeria Statistical Bulletins, Annual Reports and World Bank Global Financial Development. Analysis of the data was done with Ordinary least Square regression. Results showed that Maximum lending rate, Real Interest rate and Savings deposit rate had negative and significant effects on the profitability of Nigerian deposit money banks as measured by return on assets. Furthermore, it was found that Real interest rate had negative and significant relationship with Return on Equity of money deposit banks in Nigeria, while no significant relationship was found between interest rate variables and net interest margin of Deposit Money Banks in Nigeria. The study concluded that profitability of the banks is dependent on changing interest rates. On this basis, it was recommended that government should adopt monetary policies that will facilitate improvement in the profitability of the Nigerian deposit money banks while reviewing and strengthening bank lending rate via effective and efficient regulatory and supervisory framework.

Udoka (2012) investigated the effect of interest rate fluctuation on Nigerian economic growth between 1970 and 2010. Gross Domestic Product was the dependent variable which measured economic growth while prime lending rate was the independent variable. Data were collected from the Central Bank of Nigeria Statistical Bulletin and

analyzed by using ordinary least square regression analytical technique. Findings revealed that there was an existence of negative relationship between interest rate and Nigerian, such that increase in interest rate negatively affected Nigerian and thus retarding growth of the real sector. Consequently, it was recommended that a strong monetary policy that would facilitate lending to the real sector should be evolved so as to enhance productive capacity for overall economic growth.

Adebayo and Adofu (2021) examined the impact of the interest rate deregulation on the loans and advances of deposit money banks in the country for a period covering 1986 to 2019. Loan and advances of the banks were the dependent variables while the deposit interest rate and the lending interest rate were the independent variables. Data were sourced from annual CBN Statistical Bulletin, while the analysis was carried out by employing Autoregressive Distributed Lag (ARDL) model. Upon the analysis, it was revealed that deregulation of interest caused a negative relationship between deposit rate and banks' loans and advances, such that higher deposit rates significantly discouraged granting of loans and advances by deposit money banks it was therefore recommended that deregulation of the financial sector must be full so as to ensure that interest rate deregulation significantly facilitates the loans and advances of deposit money bank as this will encourage the desired level that can spur the growth of the sector.

Enyioko (2012) the impact of interest rate policy on performance of Deposit Money Banks in Nigerian. Data were sourced from the published audited accounts of twenty out of twenty-five banks that survived consolidation exercise; also, data were collected from the statistical Bulletin of the Central Banks of Nigeria. It was discovered that the interest rate policies failed to significantly improve the overall performances of banks while insignificantly contributing to the growth of the economy for the sake of sustainable development

Felix, Ihuoma and Odim (2015) examined the effect of interest rate deregulation on the lending operations of Nigerian commercial banks from 1970 to 2013. The study divided this period into regulated interest rate era spanning 1970-1986 and the deregulated period 1987-2013. Banks' loans and advances were the dependent variable while liquidity ratio, monetary policy rate, exchange rate, inflation rate and interest rate spread were the independent variables. Data were collected from Central Bank of Nigeria Statistical Bulletin. Pooled regression technique was used to analyzed the data and the result showed that in the regulated era, interest rate spread and statutory liquidity ratio had negative and significant effect on the value of commercial banks' loans, while fixed exchange rate had negative and insignificant impact on banks' loans and advances. Furthermore, Monetary Policy Rate and inflation rate maintained a positive and significant relationship with banks' loans for the period. In the deregulation era, the result revealed that monetary policy and the exchange rate had significant impact on banks' loans and advances. On the other hand, interest rate

spread, statutory liquidity ratio and inflation rate were found to have significantly impact on commercial banks' loans and advances. Based on this, it was concluded that there was an inelastic relationship relatively between interest rate spread and banks' loans during the deregulated interest rate regime. It was therefore recommended that the monetary authority should adopt a guided interest rate deregulation regime by using monetary policy rate increasingly to regulate the loans and advances of commercial banks in Nigeria

Nwandu (2016) examined the effect of rising interest rates on the performances of the Nigerian manufacturing sector from 1981 to 2015. Data for the study were collected from the CBN's Statistical Bulletin and analyzed using ordinary least square regression technique. Findings revealed that rising interest rate in Nigeria had a negative effect on the contribution of the manufacturing sector to GDP as well as on the average capacity utilization of the Nigerian manufacturing sector. This translates that the rising interest rate in Nigeria hinders the performances of the Nigerian manufacturing sector to lessen the cost of production. Based on this finding, it was recommended that the Nigerian Government should endeavour to provide infrastructural facilities in the areas of power and transport in addition to trying to manage interest rate for enhanced economic growth.

Ndubuaku, Ifeanyi, Eze and Onyemere (2017) examined the impact of monetary policy regimes on the performance of commercial banks in Nigeria for period covering 1986 to 1999 for SAP period and 2000 to 1999 for post-SAP period. Furthermore, Monetary Policy Rate was the independent variable while Total Assets Value, Deposit Mobilization, Loans and Advances and Credit to the Private Sector of the banks were the dependent variables. Data were sourced from the Central Bank of Nigeria Bulletin and analyzed by employing egression and Pearson Product Moment Correlation techniques. It was found that Monetary Policy Rate in the SAP era did not have significant impact on the Total Assets Value, Deposit Mobilization, Loans and Advances and Credit to the Private Sector but significantly impacted on these variables in the post-SAP regime. It was consequently recommended that monetary policy should be made in such a way as to ensure their effectiveness in generating and stimulating the growth of banking sector.

Ekwueme and Odirin (2015) assessed the effect of interest rates regime the performance of the Nigerian Capital Market from 1981 to 2013. Performance of the capital market was proxied with market capitalization as the dependent variable while lending interest rate and the minimum rediscount rate were the independent variables. Collection of secondary data was done via CBN Statistical Bulletin and the annual accounts of quoted firms for the relevant years. Data collected were analyzed by Ordinary Least Square regression technique. The result evinced that while lending interest rate insignificantly and positively affected capital market, minimum rediscount rate significantly and negatively affected capital market performance.

Based on this result, it was recommended that capital market regulators and other regulatory agencies in Nigeria should focus on the movements in interest rates and the Minimum Rediscount Rate while efforts must be put in place to establish a policy review and reassessment mechanism that would help in assessing the impact of selected policy measures on the economy.

Okoye and Eze (2013) examined the impact of bank lending rate on the performance of Nigerian Deposit Money Banks between 2000 and 2010. Banks' performance was the dependent variables while the lending interest rate and the monetary policy rate were the independent variables. Time-series and quantitative secondary data were collected from the CBN's Statistical Bulletin and analyzed by employing Error Correction Model. The result showed that the lending rate and monetary policy rate had significant and positive effects on the performance of Nigerian deposit money banks. It was thus recommended that government should come up with policy that can enhance the performance of Nigerian deposit money banks while strengthening the bank lending rate policy via effective and efficient regulation and supervisory framework.

Igbodika and Chukwunulu (2016) investigated the effect of interest rate deregulation on economic empowerment of Nigerian from 1987 to2014. In the specified model, prime lending, savings and monetary policy rate were the explanatory variables as proxies for interest rate deregulation while per capita income was used as proxy for economic empowerment. Data were collected from the secondary source such as the CBN Statistical Bulletin, 2014 and World Development Indicator. Data were analyzed using OLS regression and the result indicated that interest rate deregulation could only account for 10.4% of economic empowerment. Also, prime lending rate had positive but insignificant effect on per capita income while savings rate and monetary policy rate had negative and insignificant effect on per capita in Nigeria. It was therefore, concluded that the deregulation policy has not engendered economic empowerment in Nigeria.

Ilugbemi (2020) examined the effect of interest rates on Deposit Money Banks' profitability in Nigeria between 2004 and 2018. Monetary policy rate, lending interest rate and treasury bill rate were the independent variables while profit after tax of the banks was used as proxy for banks' profitability. Data for this study were collected from the Central Bank of Nigeria Statistical Bulletin and the annual reports as well as the Nigerian Deposit Insurance Corporation. Analysis of data was done by employing ordinary least square multiple regression technique, Findings thus revealed that all the lending interest rate, monetary policy rate and treasury bill rate had positive but insignificant relationships with the Return on assets of Nigerian banks (ROA); moreover, the coefficient of determination showed that about 32% of the variation in the profitability could be explained by the interest rate. On the basis of the foregoing, it was concluded that lending interest rate was an insignificant predictor of Deposit

Money Banks' profitability in Nigeria while recommending that banks must ensure a good balance in pricing their loans and investment decisions so as to cover the lending cost while maintaining good banking relationship with their customers.

Conclusively, the views of the scholars who have worked in the areas similar to the focus of this study have been reviewed. Furthermore, it has been clearly revealed that previous authors have not adequately devoted attention to investigating the effect of interest rate on the growth of the financial sector. Rather, attention has been on the correlation between interest rate and the aggregate economy while a few other authors have empirically examined interest rate in relation to disaggregated sectors of the economy. However, literatures reviewed so far have implied that effect of the interest rate on the financial sector has not been given deserved attention despite the crucial role played by this sector in economic growth and development. Also, it is implied from the literature that no studies have been conducted within the period of complete deregulation of the interest rate in Nigeria that focused on the interest rate and financial sector. Thus, should this gap been left unfilled, operators in the financial sectors, policy makers and investing public would be left to suffer from worrisome gap in knowledge and information necessary for their decision making, while literature would be lagging behind on the effect of interest rate on the financial sector. It is in the light of the foregoing that this study strives to fill the aforementioned gaps by examining the effect of interest rates on the growth of Nigerian financial sector.

3. Methodology

3.1. Research Design

Patton (1990) argues that whatever research design that is chosen must be suitable for the problem being investigated. Hence, this study employed experimental research strategy and adopted ex post facto research design method. According to Hakim (2000) as cited in Suanders, Lewis and Thornhill (2009), the essence of an experiment research strategy is to study causal links so as to know whether a change in one independent variable produces a change in another dependent variable. Therefore, in accordance to the research questions, quantitative data were collected to measure the effect of interest rates (which is the independent variable) on the performance of the financial sector (which is the dependent variable). In addition, the researcher approached this study deductively by testing theoretical proposition in comparison with results obtained.

3.2. Model Specification

In order to investigate the effect of interest rate on performance of financial sector, between training and development and knowledge sharing, this study adopted the

regression model specified by Ogunbiyi, Samuel and Ihejirika (2014) while investigating the nexus between interest rate and deposit Money Banks' profitability in Nigeria. Therefore, the model estimated in this study is implicitly specified thus:

FSP = f(INTR) (3.1)

Where: FSP = Financial Sector Performance and INTR = Interest rate. Since the focus of this study is on lending interest rate, deposit interest rate, monetary policy rate and treasury bill rate : Eq(3.1) can be expanded as :

RGDPFS = f(LIR, DIR, MPR & TBR) (3.2)

Transforming Eq(3.2) to econometric model produces Eq(3.3) thus:

$KS = \beta 0 + \beta 1LIR + \beta 2\ DIR + \beta 3MPR + \beta 4TBR + ut$ (3.3)

Since the study's pre-estimation test suggested the use of, Autoregressive Distributed Lags (ARDL) estimation techniques, the following model were estimated:

$$\Delta \ln RGDP_{FSt} = \beta 0i + \beta_1 LIR_{t-1} + \beta_2 DIR_{t-1} + \beta_3 MPR_{t-1} + \beta_4 TBR_{t-1} + \sum_{i=1}^{p} \theta_i \Delta \ln RGDPFS_{t-1} + \sum_{i=1}^{q} \gamma i \Delta LIR_{t-1} + \sum_{i=1}^{q} \lambda i \Delta DIR_{t-1} + \sum_{i=1}^{q} \varphi i \Delta MPR_{t-1} + \sum_{i=1}^{q} \delta i \Delta TBR_{t-1} + \Psi ECM_{t-1} + Ut \quad (3.5)$$

Where:

RGDPFS: Real Gross Domestic Product of the Nigerian financial sector

LIR: average lending interest rate on the economy measured by the prime lending rate

DIR: average lending interest rate on the economy as reported by the CBN annually;

MPR: This is the ruling monetary policy rate on annual basis as approved by the monetary policy committee and published by the CBN.

TBR: This is the average rate payable to the investors annually on the bills issued by the government/monetary authorities;

B1 – β5: These are the parameters to be estimated;

β0: Regression constant

γ_i, λ_i, φ_i, δi = The short run coefficients

p = lag order of the endogenous variable

q = lag order of the exogenous variable

ΨECM_{t-1} = The is multiplier that measures the speed of adjustment speed of the RGDPFS to equilibrium on the long run should be there be any deviation in the short run which causes disequilibrium; such multiplier is expected to be negative significant statistically.

3.3. Description of the Variables

The measurement of the proxies for the dependent and independent variables are described thus:

$RGDP_{FS}$ = real gross domestic product of the financial sector as proxy for financial sector performance;

LIR= Lending interest rate which is the average prime lending rate in the financial sector

DIR = Deposit interest rate, which is the average deposit interest rate in the financial sector

MPR = Monetary policy rate which is the base lending or hurdle rate approved by the Monetary Committee and published by the CBN

TBR = Treasury bill rate which is average return rate payable on treasury bill issued by the government.

$\beta 0$ = regression constant

$\beta 1$ = regression coefficient of lending interest rate

$\beta 2$ = regression coefficient of deposit interest rate

$\beta 3$ = regression coefficient of monetary policy rate

$\beta 4$ = regression coefficient of treasury bill rate

A priori Expectation

Expectedly, the nature of the interaction between interest rate proxies and financial sector growth as depicted in Eq(3.3) should reflect the following:

$\beta 1 < 0$ or > 0 i.e Negative/Positive

$\beta 2 < 0$ i.e Negative/Positive

$\beta 3 < 0$ i.e Negative

$\beta 4 > 0$ i.e Positive

Sources of Data

Time series data used in this study were collected majorly from the CBN's annual Statistical Bulletin of various editions from 1987 to 2020. These data are readily available and have been validated and issued for the consumption of the public. Hence, reliability of the data is undoubted.

3.4. Data Analysis Method

In this study Autoregressive Distributed Lags (ARDL) model estimation technique was chosen because the variables of the study were not all stationary at levels but at both levels and first differences. Hence, the variables were mixed with both I(0) and I(1) integration orders. Since the study's pre-estimation test suggested the use of, Autoregressive Distributed Lags (ARDL) estimation techniques, the following model were estimated:

4. Results and Discussion

In this section, results of data analysis are interpreted and discussed in details.

4.1. Descriptive Statistics

The summary of the characteristics of the variables of interest in this study are displayed on Table 1.

Table 1: Summary of Descriptive Statistics

	LRGDPFS	LIR	DIR	MPR	TBR
Mean	7.141323	18.67650	6.969669	13.80882	13.40961
Median	7.258013	17.76781	4.140000	13.50000	13.14542
Maximum	7.762036	29.80000	18.80000	26.00000	26.90000
Minimum	5.795363	12.31933	1.410541	6.000000	2.090000
Std. Dev.	0.481844	3.618673	5.370464	3.799950	5.030428
Skewness	-1.027561	1.264528	0.941562	0.730780	0.040468
Kurtosis	3.676500	4.769339	2.253302	5.024827	3.462870
Jarque-Bera	6.631666	13.49613	5.813598	8.834449	0.312799
Probability	0.036304	0.001173	0.054650	0.012068	0.855218
Sum	242.8050	635.0008	236.9688	469.5000	455.9267
Sum Sq. Dev.	7.661739	432.1281	951.7822	476.5074	835.0719
Observations	34	34	34	34	34

Source: Author's Computation (2022)

Table 1 presents the outcome of the descriptive analysis of the research variables. Thus, the Table shows the characteristics of each observation in terms of the mean, standard deviation, kurtosis, skewness and Jarque-Bera statistics. Lending interest rate has the highest mean value of 18.68, and this is seconded by monetary policy rate with 13.81 mean value; while treasury bill rate has a mean value of 13.41, real Gross Domestic Product of the financial sector has 7.14 mean value and the lowest mean

value goes to deposit interest rate at 6.97; in addition, the means values of all the observations lie within the minimum and maximum values obtainable. The standard deviation results shows that real Gross Domestic Product of the financial sector, lending interest rate, monetary policy rate and treasury bill rate all have low standard deviation when compared to their mean values; this translates that the data points are not far from their average value but maintain cluster around the mean values. The skewness result shows that deposit interest rate, monetary interest rate and treasury bill rate has 0 skewness values and hence, they mirror normal skewness and symmetrical around their avarage values unlike real Gross Domestic Product of the financial sector which has lower than 0 value, signifying negative skewness with long left tail; for lending interest rate, its skewness value is more than 0 and this suggests positive skewness with long right tail

Kurtosis result shows that while real Gross Domestic Product of the financial sector and treasury bill rate are mesokurtic as they have kurtsosis values of 3; hence they are normal distributions lending interest rate and monetary policy rate are leptokurtic for having higher than 3 kurtosis values. Also, deposit interest rate is platykurtic for having lower than 3 kurtosis value. Moreover, Jaque-Bera statistics reveals that real Gross Domestic Product of the financial sector, lending interest rate, deposit interest rate and monetary policy rate are not normally distributed as their null hypotheses of normal distribution cannot be rejected for lack sufficient evidence. Treasury bill rate however, confirms the kurtosis result and remains normally distributed.

Table 2. Correlation Matrix

	LRGDPFS	LIR	DIR	MPR	TBR
LRGDPFS	1	0.1549	0.3638	-0.1939	-0.2057
LIR	0.15494	1	0.5902	0.0997	0.5041
DIR	0.36388	0.59021	1	0.2021	0.2425
MPR	-0.19394	0.0997	0.2021	1	0.6379
TBR	-0.2057	0.5041	0.2425	0.6379	1

Source: Author's Computation (2022)

The correlation matrix reported on Table 2 shows that real Gross Domestic Product of the financial sector is positively but weakly related to the lending interest rate at 15% and deposit interest rate at 36%. This affirms the expectation that increase in deposit rate would encourage more liquidity flows into the financial sector from which the financial institutions can create credits and earn more interest incomes. It also confirms the expectation that increase in the lending interest rate would influence the growth of the financial sector where such increase the lending rate does not culminate in the discouragement of borrowing, especially for urgent and necessary projects and needs. However, real Gross Domestic Product of the financial sector maintains weak and negative relationship both monetary policy rate and treasury bill rate at 19% and 21% respectively. The foregoing corroborates the expectation that increase in the

monetary plicy rate would discourage borrowing from the CBN by the deposit money banks and this would culminate in reduction in loanable funds and eventual decline in the interest incomes. For treasury bill rate, the expected relationship is contradicted as increase in the rate payable on treasury bill is expected to increase earning to the financial institutions are the major subscribers to the treasury bill.

4.2. Unit Root Test

Using Generally, Philips-Perron method, the study conducted test of stationarity for each of the variable's series to determine the number of unit roots they contain in a bit to avoid spurious estimates for the parameters; hence, Table 3a & b report the unit test result.

Table 3a. Philips Perron Unit root test at logarithmic levels

H0: Each variable has a unit root; **H1**: H0 is not true

	Philips Perron Unit root test			**Augmented-Dickey-Fuller Unit root test**		
Variables	**Critical value @5%**	**Philips Perron test statistics**	**Order of Integration**	**Critical value @5%**	**ADF-test Statistics**	**Order of Integration**
RGDPFS	-2.954021	-3.880377	I(0)	-2.954021	3.560187*	I(0)
LIR	2.954021	-3.975387	I(0)	-2.954021	3.693537*	I(0)
DIR	2.954021	-1.242139	-	-2.954021	-1.261141	-
MPR	2.954021	-3.116872	I(0)	-2.954021	-3.079667*	I(0)
TBR	2.954021	-2.971638	I(0)	-2.954021	-2.972958*	I(0)

*Notes:*Denotes significance at the 5% level and the rejection of the null hypothesis of non-stationarity. Notes:*Denotes significance at the 5% level and the rejection of the null hypothesis of non- significance.*

Source: Author's Computation (2022)

Table 3b. Unit Root Test Results at First Differences

	Philips Perron Unit root test			**Augmented-Dickey-Fuller Unit root test**		
Variables	**Critical value @5%**	**Philips Perron test statistics**	**Order of Integration**	**Critical value @5%**	**ADF-test Statistics**	**Order of Integration**
RGDPFS	-2.957110	-	I(0)	-2.957110	-	I(0)
LIR	2.957110	-	I(0)	-2.976263	-	I(0)
DIR	2.957110	6.194951	I(1)	-2.957110	-6.216155*	I(1)
MPR	2.957110	-	I(0)	-2.957110	-	I(0)
TBR	2.957110	-	I(0)	-2.957110	-	I(0)

Notes:*Denotes significance at the 5% level and the rejection of the null hypothesis of non-stationarity.

Source: Author's Computation (2022)

As revealed by Table 2a, it is not all the variables that were stationary at levels; although the majority of the variables, namely real Gross Domestic Product of the financial sector, lending interest rate and treasury bill rate and monetary policy rate were all stationary at levels, deposit interest rate was not stationary at level. To this end, the variables were differenced once and the result as depicted on Table 2b shows that deposit interest rate that was not stationary at love became stationary at first differencing. The foregoing thus shows that the research variables are made up of both *I*(0) and *I*(1); in this case, the appropriate estimation Technique is Autoregressive Distributed Lags (ARDL) model suggested by Pesaran, Shin and Smith (2001).

4.3. ARDL Model Dynamic Stability Test

The estimated ARDL model was subjected to dynamic stability test as revealed by Figure 1. The result of the estimated inverse root of AR characteristic polynomial showed that all the dotted roots were enclosed inside the unit circle. Thus, the study concluded that that the estimated ARDL model did not suffer from dynamic instability.

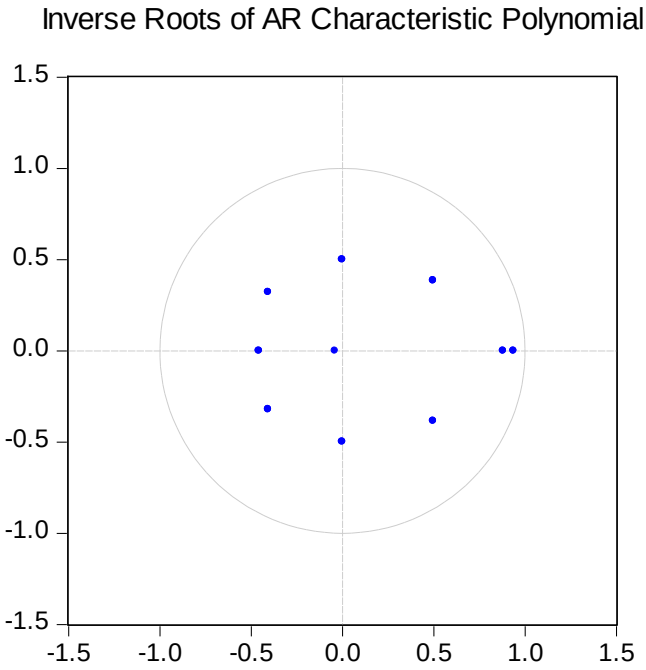

Figure 2. Model Dynamic Stability Result

4.4. Optimal Lag Length Selection

In order to determine the correct optimal lag structure for each of the variables in this study, VAR lag order selection criteria test was carried out using Akaike information criterion (AIC); and the result, which showed that the optimal lag is 4 is as depicted by Table 4. Thus, the estimation of the study's ARDL model was done with lag 4.

Table 4. Optimal Lag Length Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-305.5986	NA	676.7577	20.70658	20.94011	20.78128
1	-221.7123	134.2182	13.71868	16.78082	18.18202*	17.22907
2	-203.5994	22.94298	25.26887	17.23996	19.80882	18.06176
3	-186.0296	16.39851	64.10395	17.73530	21.47183	18.93065
4	-121.2875	38.84521*	13.05872*	15.08584*	19.99003	16.65473*

** indicates lag order selected by the criterion; LR: sequential modified LR test statistic (each test at 5% level); FPE: Final prediction error; AIC: Akaike information criterion; SC: Schwarz information criterion; HQ: Hannan-Quinn information criterion*

Source: Author's Computation (2022)

4.5. Cointegration Bound Test

To establish if there is existence of long-run co-integration relationship among the research variables, ARDL cointegrated bond test was conducted and the result is displayed on Table 3:

Table 5. Co-integration Bound Test Result

Test Statistic	Value	k
F-statistic	6.080804	4
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.45	3.52
5%	2.86	4.01
2.5%	3.25	4.49
1%	3.74	5.06

The null hypothesis (**H0)** for bond test is that no long-run relationships exist, while the alternative hypothesis (**H1)** is that long-run relationships exist; from the result on Table 5, the F-statistics is 6.08, which is higher than the critical value bounds at lower I(0) and upper I(1) bounds, and both at 1% and 5% significance levels; consequently, the null hypothesis cannot be accepted; the study thus concluded that there was existence of long-run relationship among the research variables, and this suggested the estimation of long run coefficients which are reported on Table 6.

Table 6a. Short-Run Coefficients with ARDL

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LRGDPFS(-1))	-0.297376	0.142134	-2.092222	0.0604
D(LIR)	-0.017460	0.007412	-2.355605	0.0381*
D(LIR(-1))	0.013754	0.005806	2.369005	0.0372*
D(LIR(-2))	0.000969	0.005262	0.184236	0.8572
D(LIR(-3))	0.014168	0.006244	2.269018	0.0444*
D(DIR)	0.019698	0.011794	1.670173	0.1231
D(DIR(-1))	0.013542	0.012776	1.059935	0.3119
D(DIR(-2))	-0.031622	0.014661	-2.156894	0.0540*
D(DIR(-3))	0.032959	0.009941	3.315513	0.0069*
D(MPR)	-0.021548	0.008933	-2.412061	0.0345*
D(TBR)	0.003653	0.004292	0.851225	0.4128
D(TBR(-1))	0.006345	0.003431	1.849228	0.0915
D(TBR(-2))	-0.004381	0.003450	-1.269614	0.2304

*LRGDPFS: log of real gross domestic product of the financial sector; LIR: lending interest rate; DIR: deposit interest rate; MPR: monetary policy rate; TBR: treasury bill rate. Notes: * 5% level of significance*

Source: Author's Computation (2022)

In the short run, lending interest rate is very significant in influencing the growth of the financial sector, such that a percentage rise in its current value could cause about

2% decline in the real Gross Domestic Product of the financial sector while a percentage rise its first lag could cause about 1.4% rise in the Gross Domestic Product of the financial sector. Lending interest rate at second lag is insignificant, although positive but could only influence the Gross Domestic Product of the financial sector negligibly; this is unlike the third lag that was significant and could predict the Gross Domestic Product of the financial sector to the tune of 1.4% for every 1% change its value. For deposit interest rate, the result displayed on Table 6a reveals that it was not a significant, although a positive factor in predicting the Gross Domestic Product of the financial sector in Nigeria; hence, for every 1% increase, there was about 2% and1.4 insignificant increase in the Gross Domestic Product of the financial sector in the short run.

Furthermore, in the short run, the monetary policy rate, in its current value was a negative but significant determinant of the Gross Domestic Product of the financial sector, such that for every 1% rise in it, there was about 2.2% fall in the Gross Domestic Product of the Nigerian financial sector. With respect to treasury bill rate, the result revealed that it was a positive but not a significant factor in determining the Gross Domestic Product of the financial sector in its current and first lag value; Similarly, the trend of the insignificance was repeated in the second lag, which, in this case turned negative.

Table 6b. Error Correction Model (ECM) and Long Run Coefficients

Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	9.691732	0.816033	11.876637	0.0000
LIR	-0.139129	0.054467	-2.554372	0.0268*
DIR	-0.007673	0.022634	-0.338995	0.7410
MPR	0.054027	0.045758	1.180702	0.2626
TBR	0.023842	0.033298	-0.716017	0.4889
ECM(-1)	-0.353292	0.143913	-2.454896	0.0320*

*LRGDPFS: log of real gross domestic product of the financial sector; LIR: lending interest rate; DIR: deposit interest rate; MPR: monetary policy rate; TBR: treasury bill rate. Notes: * 5% level of significance*

Source: Author's Computation (2022)

As revealed by Table 6b, interest rates and the growth of the Nigerian financial sector are co-integrated in the long run linearly as follows:

LRGDPFS = 9.6917 - 0.1391*LIR – 0.0077*DIR + 0.0540*MPR – 0.0238*TBR – 0.3533*ECM

The above long run equation is characterized with similar situations as short run. Just like in the short run, lending interest rate was negatively but significantly related to the real Gross Domestic Product of the financial sector and that for every 1% upward change in the lending interest rate, there would be about 13.9% significant decline the

Gross Domestic Product of the Nigerian financial sector in the long run, and the reverse is also true. In addition, deposit interest rate in the long run adjusted to become a negative and insignificant predictor of the Gross Domestic Product of the financial sector in a manner that it caused the GDP of the financial sector to decline by about 0.8% for every 1% rise the deposit interest rate. For monetary policy rate, it equally adjusted to positive predictor of the Gross Domestic Product of the financial sector in the long run as against the negative effect revealed in the short run. In the same way, it adjusted from being a significant factor in the short run to insignificant factor in the long run. Hence, the Gross Domestic Product of the financial sector rose by about 5.4% for every 1% rise in the monetary policy rate, and vice versa. Treasury bill rate equally moved from being a positive factor influencing Gross Domestic Product of the financial sector in the short run to be a negative factor. However, both in the short run and in the long run, treasury bill remained an insignificant determining factor. Looking at the error correction mechanism (ECM), its coefficient is -0.3533 and it is statistically significant at 0.05 critical value. This implied that should there be shocks experienced by any of the exogenous variables which, in the short run caused their disequilibrium, they would still converge to equilibrium at the speed of about 35% in the long run.

4.6. Post-estimation Tests

Table 7a. Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.543724	Prob. F(4,7)	0.2887
Obs*R-squared	14.06060	Prob. Chi-Square(4)	0.0071

Source: Author's Computation (2022)

The Autocorrelation test is usually conducted using the following hypothesis:

H0: The residuals are uncorrelated

H1: The residuals are serially correlated

Looking at the p-value (0.2887) of the F-stat which is higher than the 0.05 critical value, null hypothesis could not be rejected for lack of enough empirical evidence; hence, the study concluded that the residuals are uncorrelated and the estimated ARDL model was free from autocorrelation problem that could render the estimated coefficients inefficient, thereby leading to wrong inferences being made.

Table 7b. Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.812897	Prob. F(18,11)	0.1576
Obs*R-squared	22.43677	Prob. Chi-Square(18)	0.2132
Scaled explained SS	3.879407	Prob. Chi-Square(18)	0.9998

Source: Author's Computation (2022)

The Heteroskedasticity test is usually conducted using the following hypothesis:

H0: The residuals are Homoskedasticity

H1: The residuals are Heteroskedasticity

Table 7b reveals that F-statistic has p-value which is 0.1576, which is higher than the critical value at 0.05; hence, the null H0 could not be rejected due to insufficient evidence; the study thus concluded that the residuals in the estimated models were free from heteroskedasticity problem.

4.7. Test of Hypotheses

First Hypothesis

$H0_1$: Lending interest rate has no significant effect on the financial sector growth in Nigeria

$H1_1$: Lending interest rate has significant effect on the financial sector growth in Nigeria

From Table 5b, the lending interest rate has p-value of 0.0268, which is lower than the 0.05 critical value; i.e p-value = 0.0268< 0.05; Hence, null hypothesis could not be accepted. This implies that lending interest rate has significant negative effect on the financial sector growth in Nigeria.

Second Hypothesis

$H0_2$: Deposit interest rate has no significant effect on the financial sector growth in Nigeria

$H1_2$: Deposit interest rate has significant effect on the financial sector growth in Nigeria

From Table 5b, the p-value of deposit interest rate is 0.7410, which, in this case is higher than the 0.05 critical value i.e p-value =0.7410 >0.05; to this end, the study had insufficient evidence to support rejection of the null hypothesis; this thus connoted that the null hypothesis could be rejected and the study concluded that deposit interest rate has no significant negative effect on the financial sector growth in Nigeria

4.8. Third Hypothesis

$H0_3$: Monetary policy rate has no significant effect on the financial sector growth in Nigeria

$H1_3$: Monetary policy rate has significant effect on the financial sector growth in Nigeria.

As revealed on Table 5b, monetary policy rate has p-value of 0.2626, which is higher than the 0.05 critical value i.e p-value = 0.2626>0.05; the study could not reject the null hypothesis and hence, concluded that monetary policy rate has no significant effect on the financial sector growth in Nigeria

Fourth Hypothesis

$H0_4$: Treasury bill rate has no significant effect on the financial sector growth in Nigeria

$H1_4$: Treasury bill rate has no significant effect on the financial sector growth in Nigeria

In this case, the p-value of the treasury bill rate as reported on Table 5b is 0.4889 and this is also higher than the critical value at 0.05 i.e p-value = 0.4889 > 0.05; consequently, the null hypothesis could not be rejected due to insufficient evidence, and the study therefore, concluded that treasury bill rate has no significant effect on the financial sector growth in Nigeria

4.9. Discussion of Findings and Policy Implications

The study found that the lending interest rate, monetary policy rate and treasury bill rate had no unit root in their series and hence, stationary at level, while deposit interest rate had unit root at level but became stationary after first differencing; the implication of this is that the parameters estimates in this study are not spurious and cannot lead to wrong inferences. This finding contradicts Ogunbiyi and Ihejirika (2014) who found all the interest rate to be integrated at order one I(1), although the time frame of their study which is from 1999-2012 differs from the present study's scope. The co-integration bound test suggested that the variables moved together in the long run and that any shock experienced in the short run by any of the explanatory variables that led to deviation from the equilibrium was corrected speedily at 35%. The autocorrelation and heteroscedasticity tests revealed clearly that the estimated coefficients were freed from being biased and inefficient, thereby preventing wrong inferences from being made; this contradicts the work of Ogunbiyi and Ihejirika (2014) who reported that the residuals suffered greatly from autocorrelation and heteroscedasticity problems.

The long run estimated results showed that lending interest rate was a negative influencer of the growth of the Nigerian financial sector. This aligns with the stated theoretical and practical expectation that high interest rate on lending would discourage borrowings by the financial consumers except and limit access to funds. Therefore, by the result of this study, the lending interest rate was unaffordable to the customers and this led to customers to stay clear of borrowings from the financial institutions because any rational financial consumers would not want to borrow at

higher cost than the returns on his investment or project.; and the implications of this is that the supposed interest earnings on the discouraged borrowings are equally lost by the financial sector in. This is expected to decrease revenues, and by extension, the profitability and growth of the sector. In light of the current increase in the MPR to 13% by the CBN, lending interest rate is expected to jerk up with and this will further discourage borrowing and reduce aggregate demand as posited by Olawoyin (2022). However, the objective of neutralizing the inflationary pressure which led to the increase in the MPR may be far from being achieved; this is because increase in the MPR would trigger increase cost of borrowing; thence, ther would no demand for credits, productivity would be stifled in the industrial sector, interest earnings would slow down in the financial sector and the overall economic growth would witness slow growth. This result thus contradicts the finding by Ogunbiyi and Ihejirika (2014) that a positive relationship existed between lending rate and the banking sector growth. The contradixtion must have been due to differences in the scope of the two studies. This result also disagrees with that of Adebayo and Ilemona (2021) who reported that lending interest rate had positive effect on banking sector; the disagreement also must have arisen from the differences in the dependent variable, which in their case was the loans and advances in the banking sector i.e s sub-set of the financial sector while the present study focuses on the entire financial sector. However, the present result corroborates the work of Nwandu (2016) despite the focus of his study on the interest rate on the growth of manufacturing sector

Deposit interest rate was revealed as a negative influence on the growth of the Nigerian financial sector during the scope of the study. This result aligns with the stated relationship by the financial liberalization theory by Mackinnon (1973) and Shaw (1973). Thus while high deposit interest would stimulate people with surplus liquidity to save with the financial institutions in anticipation of higher returns on their savings, where the financial institutions do not create sufficient credits from the deposits received, the high interest rate payable on such deposits would erode large chunk of the revenues base of the deposit-taking institutions, and deplete their growth in terms of output other performance metrics; by implication this will reverse the expected positive effect expected of increased deposits to have on the growth of the financial sector. By this result therefore, it can be inferred that whether or not the increase in deposits flows into the financial sector, spurred by the increase in deposit interest rate would influence the growth of the sector depends largely on the extent to which those deposits are transformed into assets through creation of credits by the financial institutions. This result agrees with Adebayo and Ilemona (2021) who also found a negative influence from deposit interest rate on the banking sector loans and advances.

Although the monetary policy rate behaved normal in the short run, its adjustment in the long run to positive influence on the growth of the financial sector means that monetary Policy Rate betrays the stated expectation in this study; it was expected that high anchor rate should translate to high lending interest rate to the public by the banks

and other financial institutions since monetary policy rate is the cost of lending to the banks by the CBN as the lender of last resort. The possible explanation for why monetary policy rate positively influenced the growth of the financial sector is that even though the high cost of borrowing by the banks from the CBN is passed on to the financial consumers in form of high lending rate, it only temporarily discourages the financial consumers from borrowing from the financial institutions; and after a while, the financial consumers would adjust to the new lending rates and the lending institutions are back on their feet in terms of the accruing interest revenues without or with little growth retardation. Furthermore, large volume of pressing need of credits for urgent projects and other necessity during the period covered by the study might also have accounted for why monetary policy rate did not behave according to expectation as financial consumers continued to borrow to meet urgent pressing financial needs even in the face of MPR-induced high lending rate. The result obtained in respect of monetary policy rate in this study agrees with Ndubuaku, Ifeanyi, Eze and Onyemere (2017) who reported that MPR had a weak positive effect on the total assets value and deposit mobilization of the sub-financial sectors. Furthermore, the result is not different from that of Ilugbemi (2020) that MPR positively but weakly influenced banking sector profitability in Nigeria.

In addition, treasury bill rate was positively associated with the growth of the financial sector in the short run and maintained status quo behaviour in the long run. This means treasury bill rate conforms to expected financial liberation theory' postulation that high interest rate would encourage more investment because of the prospect of making high returns on the investments. Thus, since the operators in the financial sectors are usually the biggest subscribers/investors of the government treasury bills, earnings from these forms of investment are expected to support their growth profiles. Thus, by the result of this study, it is evident that earnings from treasury bill investment by the financial sector operators stimulated the growth of the financial sector, although insignificantly. It also means that in the long run, earnings from treasury bill investment were marginally low and not too attractive to the financial sector's operators and this must have accounted for the insignificant effect exhibited by the rate on treasury bill on the growth of the financial sector in the long run. This result thus corroborates Ilugbemi (2020) that treasury bill rate positively but weakly influenced banking sector profitability in Nigeria. Therefore, by the result of this study, Nigerian financial sector requires holistic interest rate policy overhaul to align the behaviours of the different interest rates ruling in the financial sector of the economy with known existing theoretical and practical expectations, since the half of the rates investigated defied expectations both in theory and practice. MPR, which is the anchor rate, needs policy streamlining to align with Nigerian economic fundamentals.

5. Conclusion and Recommendation

The study embarked on the empirical investigation of interest rate behaviour on the growth of the financial sector between 1987 and 2020. Interest rate is one of the critical macro-economic variables and invisible hands that control the supply and demand of money in the economy. Existing studies have focused mainly on the empirical investigation of the effect interest rate on the aggregate economy and sub-financial sector like the banking sector. However, present study deviated from that trend and examined the effect of interest rate on the entire Nigerian financial sector that is made of both bank and nonbank financial institutions. Although the study estimated the parameters in the short run, the long run relationship is more important to the study because of the evidence of cointegration found among the variables. As a result of this, in the long run, the study found that the behaviours of the deposit interest rate, monetary policy rate and treasury bill rate were statistically negligible in influencing the growth of the Nigerian financial sector; hence, null hypotheses could not be rejected in respect of the aforementioned interest rate; on the other hand, the behaviour of the lending interest was statistically strong in influencing the growth of the Nigerian financial sector; hence, the null hypothesis could not be accepted in this case. The implication of all these is that lending interest rate is the only rate that is very critical in predicting the growth of the financial sector; this of course, may be due to the prominent roles it plays in dictating the demand and supply of money in the economy. Based on the foregoing findings therefore, the study concludes that lending interest rate, among other rates, is a significant influencer of the growth of the Nigerian financial sector both in the short run and in the long run.

In view of the foregoing conclusion, the study recommends as follows:

i. As confirmed by this study, high lending interest rate discourages borrowing leads to loss of revenues by the operators in the financial sector. Hence, lending interest rate should be truly allowed to be dictated completely by the market forces of demand and supply of money rather than being artificially fixed or guided by the banks and the monetary authority as this will reduce the significant negative effect it has on the growth of the financial sector

ii. The negative effect of high deposit interest is expected to be neutralized by the accruing interest on expanded lending from the increased inflows of deposits. Thus the negative effect mounted on the growth of the financial sector as revealed by this study means there is no corresponding increase in credit creation to match increase in deposits fueled by high deposit rate. Hence, monetary authorities should firm up its oversight functions on the financial sector operators to ensure that the financial intermediation which is the core responsibility of the sector is accorded utmost attention. Deposit and credits created could be reviewed time to time through periodical returns made by the operators to the regulatory authorities.

iii. Although monetary policy rate supports the growth of the financial sector in the long run, but the fact that it was negative in the short run means it can create instability in the other productive sectors like manufacturing, agricultural and industrial sectors which may have to suffer; hence, monetary authority as the lender of the last resort should objectively review its monetary policy to ensure that operative monetary policy rate is reflective of the economic fundamentals, such that the growth of the financial sector is supported significantly by the monetary policy rate without impeding borrowing and lending by the deposit money banks and other financial intermediaries.

iv. Treasury bill, via rate adjustment, should be made attractive investment for the operators in the financial sector as this would stimulate revenue flows to the sector, and by extension, the growth of the sector.

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