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Original Research Article

Financial Liberalization and Interest Rate Behaviour: The Nigerian Experience

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Abstract: This study examined the effect of financial liberalization on interest rate behaviour in Nigeria from 1987 through 2018. The study made use of secondary data collected from various editions of the Central Bank of Nigeria's Statistical Bulletin covering the period under this study. Analysis of the collected data was carried out using Vector Autoregressive (VAR) Model which is an unrestricted VAR designed to be used with non-stationary data series that are found not to be cointegrated. The Augmented Dickney-Fuller test revealed that all the research variables were stationary at order one while the Johansen cointegration test revealed no cointegration relations among the variables. furthermore, while the proxies of financial liberalization such market capitalization and banking sector spread significantly but negatively influenced the behaviour of interest rate and by extension, Nigerian economic growth, deposit interest rate against the a priori expectation, showed a weak and negative relationship with lending interest. Degree of trade openness however, aligns with a priori expectation as it showed a positive but weak relationship with lending interest rate. The causality test revealed that financial liberalization has strong causality effect on the behaviour of interest rate. Based on these findings, this study concluded that financial liberalization was a strong determinant of lending interest rate behavior and has a strong causality effect on lending interest rate. Arising from this conclusion, it was recommended that government should continue to formulate economic policy that will structurally support full deregulation of the financial sector, especially, the foreign exchange market that still witnesses intermittent interventions by the regulatory authorities.

Keywords: Financial liberalization, Market capitalization, Interest rate, Degree of openness.
JEL Code: 21

INTORDUCTION

When government interferes in the determination of the ruling rate of interest at which credits are supplied in the economy, it is referred to as financial repression by McKinnon and Shaw in early 1970s. A repressed financial sector, both saving and investment are discouraged because the rates of return are lower than what could be obtained in a competitive market. In such a system, financial intermediaries fail to operate at its full capacity in promoting saving and investment thus, impeding the development of the overall economic system. This finding was based on the theoretical grounds of the liquidity preference theory propounded by Keynes [1] who postulated that interest rates had to be lowered to avoid a fall in income. Government consistent intervention and financial system involvement via the supervisory and regulatory framework, especially interest rate control and credit allocation tends to encourage financial market distortions. Thus, Interest rates control by government, credit controls, barriers to entry to financial sector, state control of banking sector, government ownership of banks and restrictions on capital flows are the major six elements of financial repression [2]. Financial liberalization is therefore, a situation in which the quantity of credit available for various productive purposes and the cost of the credits within an economy are allowed to be determined by the forces of demand and supplied rather than government directive.

One of the key reform strategies of developing economies during the globalization process is financial liberalization. Exponents of financial liberalization posit that the cause of slow growth rate in an economy is financial repression and impress it that growth would be otherwise high in an open market where there is no restriction on the free

flow of capital for productive projects. It was therefore, assumed that deteriorating growth rates for countries with high levels of financial repression, widespread bank insolvencies as the result of low quality lending, limited access to financial resources for individuals and small firms, whereas wealthy elites take advantageous position in financial repressed system, increased dependence on external financing because of negative real interest rates which results in capital flight, excessive use of capital-intensive production techniques, because artificial low real interest rates makes those projects attractive, reduced monitoring and financial resource allocation functions of financial intermediaries as the result of state allocation of financial resources to inefficient state-owned enterprises, increased risk for external crises, as the result of deteriorating fiscal balances, increased external financing or money printing are the associated cost of financial repression. Consequently, many countries over the decades have made attempts to liberalize their financial sectors through deregulation of interest rates, removal of credit controls, admitting free entry into the financial sector like banking, granting autonomy to commercial banks as well as liberalizing international capital accounts [3].

It was predicted that when capital account is liberalized, capital would be allocated efficiently around the world to the investment opportunities that offer highest rate of return, thus increasing global growth rates and growth rates within individual countries. This was why McKinnon and Shaw argued that low interest rates or negative interest rates have negative consequences on savings rates, which culminates in lower amount of funds available for investment through financial intermediaries. Furthermore, it brings about inefficient allocation of resources as low-yielding investment opportunities would be considered as good investment.

Though, the economic growth of any Nation is resting on its macro-economic stability; since implementation of SAP in Nigeria, many authors have empirically investigated the effect of financial liberalization. However, the bulk of the existing studies have focused excessively on investigating the effect of financial liberalization on target variable i.e aggregate economic growth [4-18]. Meanwhile, there are other equally important macroeconomic indicators on which effect of financial liberalization can be assessed. Hence, this study examined the effect of financial liberalization on lending interest rate in Nigeria.

Research Questions

- What is the effect of financial liberalization on lending interest rate in Nigeria?
- Is there causality between financial liberalization and lending interest rate in Nigeria?

Research Objectives

The objectives of this study are to:

- Examine the effect of financial liberalization on lending interest rate in Nigeria;
- Investigate if causality exists between financial liberalization and lending interest rate in Nigeria.

Research Hypotheses

i. **$H0_1$**: Financial liberalization has no significant effect on lending interest rate in Nigeria
ii. **$H0_2$**: There is no causality between financial liberalization and lending interest rate in Nigeria

Scope of the Study

The geographical scope of this study is Nigeria while the temporal dimension from 1987 to 2018. This temporal dimension is chosen because it coincides with the period during which Nigeria embraced Structural Adjustment Programme which embodied the liberalization policy of the Nigerian financial sector.

LITERATURE REVIEW

Conceptual Review

Against the belief of Arestis and Demetriades [19] that financial liberalization can theoretically lead to increase in savings, investments, and the productivity of capital thereby facilitating economic development, evidences from the developing and developed economies corroborates that financial liberalization era had led to significant destabilizing consequences, incidents of severe financial crises inclusive.

Financial Liberalization, Interest rates and Savings rates

When interest rate control by the government is relaxed, there would be rising interest rates on deposits, reduction or elimination of credit control policies. This also facilitates the efficient allocation of resources by banks due to increase in reserve requirements which, in a competitive bank market environment, will also increase the interest rates on deposits. According to Campbell and Mankiw [20], many countries that have gone through financial liberalization and its attendant removal of artificial interest rates ceilings have equally been exposed to high rise in real interest rates. Despite the fact that negative real interest rates is widely believed to have negative consequences on savings and investment, it does not actually mean that high real interest rate can automatically promote savings and investments

because incomes of the majority of the population from the developing countries and low income earners who may be passive or non-responsive to high level of changes in real interest rate.

Liberalization and Efficient Allocation of Domestic Financial Resources

The proponents of financial liberalization hinged their arguments on the fact that such process would lead to more efficient allocation of financial resources on commercial basis to most productive enterprises, which in turn would increase the level of the productivity and growth rate of the economy. The studies of Indonesia by Siregar [21] and Ecuador by Jaramillo [22] find that credit allocation was shifted to more technologically advanced and efficient firms. Number of studies in Korea and Mexico confirmed that financial liberalization led to greater access and improvement of allocation of credit to smaller firms that have been disadvantaged in repressed system. Galindo, Schiantarelli and Weiss [23] found strong evidence that liberalization in twelve developing countries resulted in an increase in the efficiency of the allocation of resources.

Financial Liberalization and Capital Flows

Liberalizing the capital account directly contributes to lowering the barriers to capital outflows; neoclassical theories suggest that free flows of external capital should be equilibrating and help smooth a country's consumption and production paths. However, in the real world, liberalization of capital flows has constantly been associated with serious economic and financial crises in Asia and Latin America in the 1990s. There is a large body of empirical work presenting the close link between the liberalization of the financial system and economic and financial crises particularly in developing countries. Theoretically, it is possible that the instability caused by capital account liberalization is more than compensated for by faster long-run economic growth due to greater availability of capital inflows [24, 25]. Although this statement is frequently suggested by the proponents of liberalization reforms, the results of empirical studies on the effects of capital account liberalization on economic growth are mixed. While Edison, Levine, Ricci and Slock 2002, do not find a strong relation between international integration and economic growth, Borensztein, De Gregorio and Lee [29] find that there is a positive link between FDI and economic growth when the education level is high in the host country. In contrast, Mody and Murshid [30] find that there is a one-to-one relation between the capital inflows and the domestic investment, but the link becomes weaker over time.

The literature distinguishes three broad categories of financial liberalization measures, namely, capital account liberalization, equity market liberalization, and banking sector liberalization.

Financial Liberalization and Banking Sector

Removing or relaxing entry barriers for banks and bank privatization programs have a similar impact on deposit rates, because both these policies increase bank competition. At the same time, however, increasing bank competition may also increase the probability of financial crises, which raises the risk of investing in the home country; Establishing or improving the financial regulation and supervision of banks increases the stability of the banking sector, which may reduce the probability of financial crises. This, in turn, may contribute to reducing the risk on domestic investments. At long last, all of the above may act as a signal of credible and prudent macroeconomic policies, capable of reducing the risk of investing in the home country. Furthermore, Development of the more sophisticated financial sectors by the contribution of foreign banks and investors is expected to lead to a sustainable economic growth in these economies. However, free capital mobility which is another outcome of the financial integration has led to a highly unstable international financial environment leaving the developing economies in deep financial turmoil.

Financial Liberalization and Economic Growth

Financial sector deregulation requires the non-intervention of the government. The operators of the financial sector, being entrepreneurs will ensure that they bring about better services, stronger growth and improved earnings. The resultant development from the liberalization will then have multiplier effects on all other sectors of the economy. An industry that depend on external financing, rather than undistributed profits, will record a faster growth [26, 27].

Theoretical Review

In the light of the central position and the pivotal role played by the financial sector, many economists have provided evidence to show that there is a direct linkage between the financial sector and the growth and development of the nation's economy. Thus, some of the relavant theories to this study are reviewed as follows:

Financial Liberalization Theory

Financial liberalization theory was proposed by McKinnon–Shaw in 1973. The central message of this theory is that government intervention in the financial sector via indiscriminate regulations leads to financial repression due to distortion caused by those regulations. Hence, there is need to remove government intervention from the financial market such that cost allocation of financial resources within an economy are determined by the market forces. In line with this theory, if financial sector is liberalized, there will be significantly increase in interest rate which will encourage savings,

increase in savings mobilization will culminate in increase in investment, and this will have positive multiplier effect on the economic growth. Hence, McKinnon–Shaw in 1973 summarily viewed financial liberalization as an advocacy for market-determined interest rates; greater ease of entry into the banking sector to encourage competition; the elimination of directed credit programmes; reduced fiscal dependence of the state on credit from the banking system; the integration of formal and informal markets and a movement towards equilibrium exchange rates and, eventually, flexible exchange rate regimes with open capital accounts.

Keynesian Theory

The Keynesian view on the role of finance in economic growth portends that investment decisions are primarily determined by the level of confidence, expected demand and what is known as 'Animal spirits' of the private investors. Underlying the Keynesian view is the fundamental message that it is investment that determines savings, and not vice versa. Although, in principle, the rate of interest matters, in practices it is regarded as being reflectively insignificant compared to demand factors. High real interest rate may stifle investment and growth. The disequilibrium approach within the context of the Keynesians tradition implies that investment is a function of the prospect for profit and the building constraint on firm's sales [28]. Furthermore, it is not always true that a perfect capital market will lead to an optimal allocation of investment. This is because Keynesian in the general theory has linked the stock market to a gambling casino which is dominated by speculators and investors with short-term outlook.

Neo-classical Theorists

According to neo-classical theorists, like Alfred Marshall, Friedrich Von and W.S Jevons, financial liberalization will make the cost of capital to decrease, while productivity and output will grow. In reality, this does not happen. After financial liberalizations both the real interest rate and supply of credit of the non-traded goods sector rise. From a neo-classical point of view, liberalizing financial markets would stimulate savings, and enhance physical capital formulation [31]. This hypothesis is to influence the financial system ability to provide financial capital needed for firms investment, and at a relative affordable price. According to this analysis, therefore, financial liberalization should facilitate the creation and entry of new firms into industry, as well as enhance the growth and expansion of incumbent firms [32]. According to Robert Solow, the growth model posits that economic growth depends on capital accumulation, increasing the stock of capital goods to expand productive capacity, and the need for sufficient savings to finance increased allocation of resources towards investment

Empirical Review

Akpan [11] conducted a study to analysis the effect of financial liberalization in the form of an increase in real interest rates and financial deepening on the rate of economic growth in Nigeria using the endogenous growth model. The study used time series annual data over the period from 1970 – 2002. GDP was proxied for economic growth while interest rate and other financial deepening indicators were proxied as independent variables. The study employed Error Correction model (ECM) to capture both short and long run impact of the variables in the model. The results showed a low coefficient of the real deposit rate which implied that interest rate liberalization alone was unlikely to accelerate economic growth. Overall, the results showed a positive impact on the economy of Nigeria.

Imran, Ali and Fatima [30] examined the impact of financial sector liberalization indicators on macroeconomic performance in Pakistan by using time series econometric analysis over the time period 1972-2006. The study specified bi-variate and multi-variate models for empirical analysis. The results suggested a significant positive impact of financial liberalization variables on economic growth and investment. The findings of this study also revealed the long- run and short-run relationship between the indicators of financial liberalization and economic growth and investment in Pakistan. Part of the findings also show that the multivariate models that all variables have correct positive signs according to the hypotheses but broad money, private sector credit, stock market capitalization and trade openness were significantly affecting economic growth and investment.

Camper and Golberge [34] examined the impact of financial sector liberalization measures on household sector saving rate in India. Saving rate was proxied as dependent variable while time series financial liberalization index such as total credit to household sector by bank and other financial institutions, foreign investment, market capitalization ratio and real effective exchange rate as independent variables were proxied as independent variables. The study covered the period of 1970 to 2000. The model of the study was estimated using the VAR technique. The findings showed that the financial liberalization index has a negative impact on household saving rate due to the fact that the increased credit availability as a result of financial liberalization lead to increase in consumption rather than savings.

Also, Obamuyi [12] examined the relationship between interest rates liberalisation and economic growth in Nigeria. Using time series analysis and annual data from 1970 to 2006, the study proxied GDP as dependent variable while lending interest rate, investment were proxied as independent variables. Co-integration and error correction model were employed to capture both the long-run and short run dynamics of the variables in the model. Finding showed that in

Nigeria, the real lending rates have significant effects on economic growth. Also, showed a long-run relationship existed between economic growth and interest rate liberalization. Evidently, the study confirmed a positive relationship between interest rates and investment, on the one hand, and investment and economic growth; on the other hand, while the study concluded that the behaviour of interest rate in a liberalized economy was important for economic growth.

Sulaiman, Oke and Azeez [15] empirically investigated the effect of financial liberalization on the economic growth in developing nations in Nigeria. Annual time series data on these variables were largely obtained from the Central Bank of Nigeria Statistical bulletin from 1987 to 2009. The study proxied Gross Domestic Product as the dependent variable and the following macroeconomic variables; lending rate, exchange rate, inflation rate, financial deepening (M2/GDP) and degree of openness as its financial liberalization indices. The method of analysis included Johansen Co-integration test and the Error Correction Mechanism. While the Cointegration test revealed the existence of a long-run equilibrium relationship among the variables and cointegrating equations at 5% significance level, the Error Correction Mechanism showed a very high coefficient of multiple determinations (R2) in both the Over-parameterized Model (95%) and the Parsimonious Model (91%).

Chaudhry [35] examined the impact of financial sector liberalization indicators on macroeconomic performance in Pakistan by using time series data over the time period 1972–2006. The study undertakes bivariate and multivariate models for empirical analysis. Independent variable was proxied by interest rate, investment and savings; while dependent variable was also proxied by GDP. The result suggested that there was a significant positive impact of financial liberalization variables on economic growth and investment. The finding of the study also revealed the long-term and short-term relationship between the indicators of financial liberalization and economic growth and investment in Pakistan.

Okpara [36] carried out empirical investigation on the effect of financial liberalization on some macroeconomic variables in Nigeria in a comparative manner. The studied period for pre-liberalization was 1965 to 1986 while 1987 to 2008 was the post-liberalization period for the study. This study focused on some selected macroeconomic variables namely, Gross Domestic Product (GDP), foreign direct investment, financial deepening, savings and inflation rate in Nigeria. He employed three alternate methods: parametric paired sample statistic for t-test, the non-parametric Wilcoxon signed rank test to determine whether significant differences exists between pre/post liberalization macroeconomic variables; and the third method which was the discriminant analysis was meant to determine the direction as well as the magnitude of the discriminant variables. The result showed that while real GDP recorded (highest) positive and significant contribution, national savings and foreign direct investment made negative and significant contribution. Also, there was no significant difference between the pre-liberalization and post-liberalization rate of inflation and financial deepening in the country. Thus, according to this study, financial liberalization has no effect on the financial deepening and the rate of inflation.

Eregha [4] examined variations in interest rate and investment determination in Nigeria. The study employed dynamic model of two equations using instrumental variable technique of estimation on data from the World Development Indicator. The study revealed that variation in interest rate played a negative and highly significant role in investment decision in the economy and demand for credit also had negative and significant influence on interest rate variations in both the short run and long run. The researcher noted that though investment has an indirect relationship with interest rate variation, other variables such as debt burden, economic stability, foreign exchange, shortage and lack of infrastructure affected gross domestic investment. The study concluded that improvement in these key macro-economic variables was a necessary condition towards facilitating investment in Nigeria.

Onwumere and Ibe [33] investigated the effect of interest rate liberalization on Nigeria's domestic savings and investment. The study covered 1976 through 1999 and proxied interest rate as independent variable while saving and investment were proxied ad dependent variables. Using simple regression method of analysis, the study showed that interest rate liberalization had an inverse insignificant effect on savings as well as an inverse but significant effect on investment in Nigeria. Interest rate liberalization was counter-productive in Nigeria. The study suggested that the government should separate transactions that have to do with loan and those that involve deposits.

Ogwumike and Ofoegbu [9] investigated how financial liberalization impacted on Nigeria's domestic savings from 1970 to 2009. By using autoregressive distributed lagged (ARDL) model method of estimation, the study discovered that domestic savings, financial liberalization lagged one exerted a minimal positive effect on domestic savings, but its significance lasted for a short time as it turned to be an inverse effect in the long-run. The findings further revealed that financial liberalization did not instigate a positive interest rate that is strong enough to drive more savings. Also, private sector credit, exhibited a positive and significant influence on domestic savings in the long and short-run periods. More so, the study revealed that interest on deposit owing to the adoption of financial liberalization, was not the major factor that stimulated an increased savings but absence of investment alternatives different from financial assets.

Goldfajn and Minella [37] examined the relationship between capital account liberalization and macroeconomic volatility over a recent period in Brazil. Using VAR methodology to measure the impact of capital flow movements on the following set of economic variables: industrial output, current transactions balance, private capital account, terms of trade, the impulse-response function and variance decomposition results showed that an increase in country risk generates a positive response in interest rates, exchange rate depreciation, reduction in capital flows and, after a certain lag, a fall in product. Meanwhile, positive shocks to capital flows were not persistent, although they did not entail a reduction in interest rates, which in turn seems to cause depreciation in the exchange rate.

Adusei [38] empirically examined the effect of financial liberalization on economic growth. The study found out that financial liberalization has a negative relationship between financial development and economic growth in Ghana by analyzing annual data during 1971-2010. Using VECM approach, the study found that due to lax supervision of the Ghanaian financial system, it grants more autonomy to bankers and banking institutions. By contrast, banks were unable to distinguish between good and bad investment projects due to lack of skilled professionals. Therefore, financial liberalization in Ghana has led to over-lending or careless-lending, which has impacted negatively on economic growth. The study therefore, suggested that the Ghanaian government should take tighter regulation on the banking sector, especially in their lending services

Okwuchukwu and Ariwa [39] studied the impact of financial system liberalization, Savings and Investment on the economic growth in Nigeria. The selected indicators of financial liberalization used were ratio of liquid liabilities to GDP (M2GDP) and real interest rate (INT) are savings (SAV) and investment (INV). Time series data from 1970 to 2014 were employed in the estimation of variables. Using the Augmented Dickey Fuller unit root test (ADF) and Johansen cointegration test, the study found out that there was long and short run relationship between the dependent and independent variables. The results of the estimation revealed that the explanatory variables were able to influence the growth process positively and significantly in the economy of Nigeria except interest rate which had negative impact. To this effect the study suggested that monetary policies should be geared towards increasing the level of money supply to enhance savings and investment.

Usuah, Odozi and Adeniyi [40] examined the relationship between financial liberalization and the growth of Small and Medium Scale Enterprises (SMEs) in Nigeria from 1981- 2012. Using some key macroeconomic variables such as investment, inflation and the domestic national output (GDP) as independent variables and commercial bank credits to SMEs as the dependent variable, the study employed Autoregressive Distributed Lags Model for data analysis. The result of this study revealed that financial liberalization had negative though non-significant effect on the growth of SMEs in Nigeria. Also, inflation had a positive and significant effect on the growth of SMEs in Nigeria. Investment had a positive though non-significant effect on the growth of SMEs in Nigeria. Finally, GDP had a large negative but significant effect on the growth of SMEs.

METHODOLOGY AND THEORETICAL FRAMEWORK

Research Design

The event being investigated in this study had occurred before kick starting this investigation; hence, this study adopted ex post facto research design.

Theoretical Framework

This study was hinged on the theory of financial liberalization which was propounded in 1973 by MCkinnon-Shaw. In line with this theory, if financial sector is liberalized, there will be significantly increase in interest rate which will encourage savings, increase in savings mobilization will culminate in increase in investment, and this will have positive multiplier effect on the economic growth. Thus, this study tested whether financial liberalization truly has increasing effect on interest rate

Sources of Data

Time series data were collected from the Central Bank of Nigeria Statistical Bulletin for the covered by this study which is 1986 through 2018.

Model Specification

This study adapted the model specified in Sulaiman, Oke and Azeez [41] when they investigated the effect of financial liberalization on economic growth in Nigeria. Thy specified the following model:

GDP = f (LR, EXR, INF, FD, DOP)……..….Eq(3.1)

The above model was adopted as follows:

LIR= f (BASP, MCAP, DIR, DOP)……..….Eq(3.2)

Transforming equation 3.2 to econometric model becomes:
LIR= α + β1BASP + β2MCAP + β3DIR + β4DOP + Ut …… Eq(3.3)

Taking the Natural Logarithm of equation 3.3, produced equation 3.4 as follows:
LIR = α + β1lnBASP + β2lnMCAP + β3DIR + β4lnDOP + Ut …… Eq(3.3)
Note: LIR and DIR were not logged because they were already stated in percentages

Where:
LIR = lending interest rate which is prime lending rate at which credits are supplied in Nigeria
BASP = Banking spread which measures banking sector liberalization;
MCAP = Capital market capitalization which measures Liberalized equity markets and indicates a measurement of stock market development;
DIR = Deposit interest rate; Liberalization leads to experience of high rise of real interest rates and increased real deposit rates will promote economic growth.
DOP = degree of openness
α = Linear equation constant
β1 – β5 = parameters to be estimated
ln = natural logarithm sign
f = functional relationship denotation

A priori Expectation

According to the theoretical framework of this study, it was expected that financial liberalization would increase interest rate thereby encouraging savings and investment and ultimately, economic growth. Thus, β1>1, β2>1, β3>1, β4>1, β5>1

METHOD OF DATA ANALYSIS

In analyzing data collected in this study, Augmented-Dickney Fuller test was used to establish the stationarity of the research variables while Johansen cointegration test method was used to establish the cointegration relations. Consequently, Vector Autoregressive (VAR) Model which is an unrestricted VAR designed to be used with non-stationary data series that are found not to be cointegrated was adopted. VAR removes the structural modeling by treating all variables as endogenous in the model and as a function of the lagged values of all endogenous variables in the systems. Therefore, the estimated VAR model in this study was stated as follows:

$lnLIR_t = \alpha 1 +_{t-1} + lnBASP_{t-1} + lnMCAP_{t-1} + lnDIR_{t-1} + lnDOP_{t-1} + e_{vt}$.....Eq(3.4)
$lnBASP_t = \alpha 2 +_{t-1} + lnBASP_{t-1} + lnMCAP_{t-1} + lnDIR_{t-1} + lnDOP_{t-1} + e_{wt}$ .....Eq(3.5)
$lnMCAP_t = \alpha 3 +_{t-1} + lnBASP_{t-1} + lnMCAP_{t-i} + lnDIR_{t-1} + lnDOP_{t-1} + e_{xt}$……...Eq(3.6)
$lnDIR_t = \alpha 4 +_{t-1} + lnBASP_{t-1} + lnMCAP_{t-1} + lnDIR_{t-1} + lnDOP_{t-1} + e_{yt}$……Eq(3.7)
$lnDOP_t = \alpha 5 +_{t-1} + lnBASP_{t-1} + lnMCAP_{t-1} + lnDIR_{t-1} + lnDOP_{t-1} + e_{it}$

Where:
α1- α3 = Constant term or intercept of the model
Qi, θ_i, γ_i, λ_i, $\varphi_{i,}$ = Short run dynamic coefficients of the parameters to be estimated;
BASP, MCAP, DIR, DOP = Parameter to be estimated;

Data analysis and interpretation of findings

Table-4.1: Summary of Descriptive Statistics

	LIR	LBASP	LMCAP	DIR	DOP
Mean	8.141818	3.709295	6.644584	7.253333	39.54613
Median	4.190000	3.737670	6.639745	4.190000	16.95575
Maximum	26.80000	4.499810	9.994426	18.80000	119.2853
Minimum	1.410541	3.044522	1.916923	1.410541	6.372098
Std. Dev.	7.104472	0.507791	2.767632	5.396766	36.77758
Skewness	1.228812	0.176608	-0.316835	0.816789	0.768888
Kurtosis	3.382676	1.434845	1.689629	2.080028	1.973200
Jarque-Bera	8.506234	3.539900	2.913088	4.833023	4.701222
Probability	0.014220	0.170342	0.233040	0.089232	0.095311
Sum	268.6800	122.4067	219.2713	239.3600	1305.022
Sum Sq. Dev.	1615.153	8.251250	245.1132	932.0025	43282.89
Observations	33	33	33	33	33

Source: Author's Computation (2020)

Table 4.1 shows the descriptive nature of the time series data collected in this study. DOP has the highest mean value at 39.55. This is followed by LIR at 8.14, DIR at 7.25, MCAP at6.64 while BASP has the lowest mean value at 3.71. Furthermore, considering the standard deviation from the sample mean values, BASP has the lowest standard deviation at 0.508 which implies that all its observations cluster around its mean value and that the risk of estimation error is minimal. This is followed by MCAP with standard deviation value of 2.768 which is also low. LIR, DIR and DOP are associated with high standard deviation values of 7.104, 5.397 and 36.778 respectively. However, DOP has the highest value of standard deviation among the series, and this connotes that the observations are not clustered around the sample mean value; this portends high risk of estimation error.

Skewness measures the normality of the sample series. For data series to be normally distributed, the skewness should have 0 values. Thus, all the variables are normally distributed except LIR with 1.22 skewness values. Kurtosis measures the thickness of flatness of the distribution of the series. For a distribution to be normal, and hence, mesokurtic, its kurtosis value must be 3. From Table 4.1 therefore, only LIR is mesokurtic while all other variables are clearly platykurtic because their kurtosis values are less than 3. Platykurtic implies that all the series will have lower value below the sample means, suggesting flat tommy distribution. LIR with skewness value of 1.22 means that LIR will have long right tail and exhibits positive skewness.

The Jarque-Bera statistics measure the difference between the skewness and the kurtosis of each of the variables series with those from the normal distribution. The null hypothesis for Jarque-Bera test is that the distribution is normal. Hence, from the Table 4.1 above, and with respect to all the variables, all their Jargue-Bera probability values are above 0.05 significance level, hence the null hypothesis cannot be rejected. Consequently, BASP, MCAP, DIR and DOP are all following normal distribution curves. The case is however, different for LIR with probability value of 0.014 which is less than 0.05 significance level. Hence, there was no enough reason to accept null hypothesis which means that LIR series are clearly not normally distributed.

Table-4.3: Augmented Dickney-Fuller Unit Root Test Results at logarithmic levels H0: b = 0; Ha: b > 0

Variables	**Critical value @5%**	**ADF test statistics**	**Remarks**	**Order of Integration**
LIR	-2.991878	-1.710712	Non-stationary	N/S
BASP	-2.957110	-1.397689	Non-stationary	N/S
MCAP	-2.957110	-1.615801	Non-stationary	N/S
DIR	-2.957110	-0.953174	Non-stationary	N/S
DOP	-2.957110	-0.486777	Non-stationary	N/S
	Unit root test at first differences			
Variables	**Critical value @5%**	**ADF test statistics**	**Remarks**	**Order of Integration**
LIR	-2.991878	-3.316681*	Stationary	I(1)
BASP	-2.960411	-5.158932*	Stationary	I(1)
MCAP	-2.960411	-4.298219*	Stationary	I(1)
DIR	-2.960411	-6.395540*	Stationary	I(1)
DOP	-2.960411	-4.608959*	Stationary	I(I)

Notes:*Denotes significance at the 5% level and the rejection of the null hypothesis of non-stationarity.
Source: Author's Computation (2020)

Table 4.2 shows the unit root test results of research variables. Obviously, none of the variables was stationary when defined at levels. However, when the variables were differenced at first, all the unit roots in the variables were removed; and they all became stationary at first differencing. This unit root is very important while working with time series data because it is a general knowledge they normally contains trends which need to be removed to avoid spurious estimates. Therefore, it is a general facts that when all the variables are stationary at order I(1), there is need to carry out co-integration test. Hence, the result of this test is displayed on Table 4.4 while the optimal lag length selection using Akaike Information Criteria (AIC) is depicted on Table 4.3:

Table-4.3: Optimal Lag Length Selection

VAR Lag Order Selection Criteria						
Endogenous variables: LIR LBASP LMCAP DIR DOP						
Exogenous variables: C						
Date: 02/04/20 Time: 12:32						
Sample: 1986 2018						
Included observations: 31						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	-343.7947	NA	4079.025	22.50289	22.73417	22.57828
1	-219.0396	201.2179*	6.702054*	16.06707*	17.45480*	16.51944*
2	-209.6008	12.17913	20.96667	17.07102	19.61519	17.90036
* 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 (2020)

From Table 4.3, the value of AIC is minimized at lag 1; hence, the optimal lag length for the variables is 1.

Table-4.4: Johansen Cointegration Test Result

Date: 02/04/20 Time: 15:09				
Sample (adjusted): 1988 2018				
Included observations: 31 after adjustments				
Trend assumption: Linear deterministic trend				
Series: LIR LBASP LMCAP DIR DOP				
Lags interval (in first differences): 1 to 1				
Unrestricted Cointegration Rank Test (Trace)				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None	0.510460	53.60397	69.81889	0.4787
At most 1	0.336951	31.46101	47.85613	0.6416
At most 2	0.283019	18.72289	29.79707	0.5130
At most 3	0.161651	8.409007	15.49471	0.4227
At most 4	0.090570	2.943064	3.841466	0.0862
Trace test indicates no cointegration at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

Source: Author's Computation (2020)

Null hypotheses of no co-integration: H_0: $\beta_{1,} = \beta_{2,} = \beta_{3,} = \beta_4 = \beta_5 = 0$
Alternative hypotheses: H_1: $\beta_{1,} \neq \beta_{2,} \neq \beta_3 \neq \beta_4 \neq \beta_5 \neq 0$

From the Table 4.4, Trace statistics are all less than critical values at 0.05 level thereby supporting the acceptance of null hypotheses of no cointegration among the variables was accepted. Hence it was concluded that there was no long run equilibrium relationship among the variables. The foregoing suggests that Unrestricted VAR model should be specified and estimated for interpretation.

Table-4.5: Vector Autoregressive Estimates

Vector Autoregression Estimates					
Date: 02/04/20 Time: 15:23					
Sample (adjusted): 1987 2018					
Included observations: 32 after adjustments					
Standard errors in ( ) & t-statistics in [ ]					
	LIR	LBASP	LMCAP	DIR	DOP
LIR(-1)	0.580316	-0.000442	-0.016078	0.193864	0.357374
	(0.23686)	(0.02477)	(0.02826)	(0.15404)	(0.86109)
	[2.45006]	[-0.01785]	[-0.56889]	[1.25856]	[0.41503]
LBASP(-1)	-2.174001	0.736202	-0.068708	-0.874935	-12.37192
	(1.34607)	(0.14076)	(0.16062)	(0.87539)	(4.89361)
	[-1.61507]	[5.23011]	[-0.42777]	[-0.99948]	[-2.52818]
LMCAP(-1)	-1.720737	-0.044845	1.038454	-1.130017	5.019205
	(0.45646)	(0.04773)	(0.05447)	(0.29685)	(1.65946)
	[-3.76970]	[-0.93949]	[19.0659]	[-3.80665]	[3.02459]
DIR(-1)	-0.090819	0.002793	0.028224	0.334187	0.377401
	(0.33458)	(0.03499)	(0.03992)	(0.21758)	(1.21634)
	[-0.27145]	[0.07984]	[0.70697]	[1.53589]	[0.31028]
DOP(-1)	0.030700	0.000169	-0.005773	0.023796	0.614922
	(0.02728)	(0.00285)	(0.00326)	(0.01774)	(0.09917)
	[1.12539]	[0.05917]	[-1.77370]	[1.34133]	[6.20045]
C	22.10919	1.249628	0.402820	12.86008	24.34612
	(6.08568)	(0.63640)	(0.72616)	(3.95771)	(22.1243)
	[3.63298]	[1.96360]	[0.55473]	[3.24938]	[1.10042]
R-squared	0.909329	0.803732	0.990644	0.933408	0.954712
Adj. R-squared	0.891892	0.765988	0.988844	0.920602	0.946002
Sum sq. resids	145.9280	1.595783	2.077696	61.71730	1928.676
S.E. equation	2.369096	0.247742	0.282686	1.540695	8.612773
F-statistic	52.15002	21.29438	550.5755	72.88744	109.6197
Log likelihood	-69.68407	2.567911	-1.654412	-55.91529	-110.9877
Akaike AIC	4.730254	0.214506	0.478401	3.869705	7.311730
Schwarz SC	5.005080	0.489331	0.753226	4.144531	7.586556
Mean dependent	8.068125	3.719983	6.792323	7.183125	40.35818
S.D. dependent	7.205325	0.512131	2.676444	5.467786	37.06425
Determinant resid covariance (dof adj.)		2.402948			
Determinant resid covariance		0.850866			
Log likelihood		-224.4462			
Akaike information criterion		15.90288			
Schwarz criterion		17.27701			

Source: Author's Computation (2020)

From Table 4.5, it is deductible that the past realization of lending interest rate (LIR-1) is associated with about 58% increase in current value of lending interest rate (LIR) on average ceteris paribus while its t-statistics value (2.45) indicates that the lending interest rate strongly predicts itself. Looking at the past realization of banking spread (BASP-1), shows its 1% increase is associated with about 200% decrease in the lending interest rate and vice versa. This is however contrary to a priori expectation in this study that banking sector liberalization will increase interest rate and thereafter encourage savings and investment. The reason for this negative relationship might not be far from the demand and supply forces coupled with predatory credit pricing by competitors in the banking industry all of which might have pushed down the lending interest rate following liberalization. The impact of banking spread is however weak on lending interest rate, going by the t-statistic value (1.61).

Also, against theoretical expectation, the past realization of market capitalization (MCAP-1) negatively and strongly predicts lending interest rate such that a percentage increase in market capitalization causes lending interest rate to decrease by about 170%. The past realization of deposit interest rate (DIR-1) also violates the a priori expectation as it shows a weak and negative relationship with lending interest rate such that a percentage increase in it will culminate in about 9% decrease in the lending interest rate and vice versa. Degree of openness however, aligns with the a priori expectation as it shows a positive but weak relationship with lending interest rate; hence, a percentage increase or

decrease in degree of openness is associated with about 3% increase or decrease in lending interest rate. Above all, judging from the F-statistic statistics value of 52.15 on Table 4.5, the joint effect of the financial liberalization proxies is significant suggesting the rejection of the null hypothesis that financial liberalization has no significant effect on the lending interest rate.

From the Banking spread equation (LBASP), only the past realization of the banking spread (BASP-1) has strong and positive relationship with its current value. Hence, liberalized banking sector is strong and positive influence of itself. On the contrary, all other predictors in this equations (LIR-1, LMCAP-1, DIR-1 and DOP-1) having weak relationship with the banking sector spread, such that the first lag of lending interest rate (LIR-1) and market capitalization (MCAP-1) are negative and weak determinants of banking sector liberalization while the first lag of deposit interest rate (DIR-1) and Degree of openness (DOP-1) are having weak but positive impact on the banking sector liberalization. Looking at the market capitalization equation (LMCAP), only the first lag of market capitalization (LMCAP-1), has strong and positive influence on itself while all other variables are weak predictors of the liberalized capital market.

The relationship of the first lag of lending interest rate, banking spread, and degree of openness are negative while that of deposit interest rate is positive with liberalized capital market. Also, in the deposit interest rate equation (DIR), it is only the first lag of market capitalization (MCAP-1) that is a strong predictor of deposit interest late while all other variables are weakly predicting deposit interest rate with fist lag of lending interest rate, degree of openness having positive relationship with liberalized deposit interest rate while the first lag of banking spread, market capitalization are negative predictors of deposit interest rate in the liberalized financial market. With respect to degree of openness equation (DOP), its past realization (DOP-1) has a very strong influence on itself such that a percentage increase in its first lag will cause about 61% increase in its current value and vice versa; moreover, first lag of lending interest rate and deposit interest rate are equally positive but weak determinants of degree of openness while the first lag of market capitalization is a strong and positive determinant of degree of openness.

Causality Test

The result of Granger Causality/ Block Exogeneity Wald test is presented in the Table 4.6 below:
This causality test is guided by the following hypotheses:
H_0: Lagged coefficients = 0
H_1: Lagged coefficients $\neq 0$
Decision criteria: Reject null hypothesis if the prob-value of the chi^2-statitstic is ≤ 0.05

Table-4.6: Granger Causality/ Block Exogeneity Wald test

VAR Granger Causality/Block Exogeneity Wald Tests			
Date: 10/16/20 Time: 22:07			
Sample: 1986 2018			
Included observations: 32			
Dependent variable: LIR			
Excluded	Chi-sq	df	Prob.
LBASP	2.608445	1	0.1063
LMCAP	14.21066	1	0.0002
DIR	0.073683	1	0.7860
DOP	1.266497	1	0.2604
All	19.90195	4	0.0005
Dependent variable: LBASP			
Excluded	Chi-sq	df	Prob.
LIR	0.000319	1	0.9858
LMCAP	0.882638	1	0.3475
DIR	0.006374	1	0.9364
DOP	0.003501	1	0.9528
All	5.886924	4	0.2078
Dependent variable: LMCAP			
Excluded	Chi-sq	df	Prob.
LIR	0.323632	1	0.5694
LBASP	0.182991	1	0.6688
DIR	0.499806	1	0.4796
DOP	3.146005	1	0.0761
All	4.849657	4	0.3031

Dependent variable: DIR			
Excluded	Chi-sq	df	Prob.
LIR	1.583976	1	0.2082
LBASP	0.998954	1	0.3176
LMCAP	14.49061	1	0.0001
DOP	1.799171	1	0.1798
All	22.48569	4	0.0002
Dependent variable: DOP			
Excluded	Chi-sq	df	Prob.
LIR	0.172246	1	0.6781
LBASP	6.391689	1	0.0115
LMCAP	9.148173	1	0.0025
DIR	0.096271	1	0.7564
All	16.30060	4	0.0026

Source: Author's Computation (2020)

Table 4.6 reveals the causality effect of the lagged coefficients on each of the dependent variables in this study. Looking at lending interest rate equation (LIR), the individual proxy of financial liberalization seems not to have causality effect on the lending interest rate except market capitalization. However, a closer look at the joint effect of the proxies for financial liberalization reveals probability value of 0.0005 which is clearly less than critical value at 0.05 significant level; hence, there was no enough reason to accept null hypotheses of no causality effect. This translates that alternative hypothesis was accepted and null hypothesis rejected. Therefore, it was concluded in this test that financial liberalization has short-run causality effect on the lending interest rate.

However, with respect to banking spread (BASP) and market capitalization (MCAP) equations, the joint causality effect of the financial liberalization proxies was significant as revealed on Table 4.6. Hence, null hypothesis was accepted and conclusion reached that financial liberalization has no causality effect on the each of the banking spread and market capitalization. In the cases of deposit interest rate (DIR) and degree of openness (DOP) equations, the chi-square has probability values of 0.0002 and 0.0026 respectively which are less than the critical value at 0.05 significant levels. Null hypotheses were evidently rejected in these two cases, it was concluded that financial liberalization has no causality effect on deposit interest rate and degree of openness in the short-run.

CONCLUSION AND RECOMMENDATIONS

Following a theoretical exposition that financial repression causes financial distortion and prevents optimal allocation of financial resources and the assertion that financial liberalization would cause an increase in interest rate for the benefits of economic growth, this study investigated the effect of financial liberalization on interest rate in Nigeria from the beginning of liberalized financial sector in Nigeria 1986 through the 2018. Against the direction of numerous existing studies, this study found out that most the proxies of financial liberalization were negatively related to interest rate such that a percentage increase in them would cause a decrease in the lending interest rate. More specifically, liberalized banking sector, market capitalization, deposit interest rate were all found to be negative predictors of lending interest rate. Trade openness was however, found to be positively though weakly associated with lending interest rate. This must have been due to the fact that trade openness brings many economic benefits, including increased technology transfer, transfer of skills, increased labour and total factor productivity and economic growth and development. Nevertheless, the joint effect of the financial liberalization proxies was found to be significant on lending interest rate judging from F-statistics value of 52.15 while the causality effect of financial liberalization on lending interest rate was confirmed to be significant. It was therefore concluded in this study that financial liberalization was a strong determinant of lending interest rate behaviour and has a strong causality effect on lending interest rate.

Consequent upon the findings in this study, the following recommendations were proffered:

i. Financial sector should be placed under constant watch of the monetary authorities for possible intervention when necessary so as to ensure liberalization is not counter-productive to economic growth.
ii. Given that liberalized banking sector was found to be negatively related to interest rate in this study, monetary authorities should adopt partial interest rate ceiling where the forces of demand and supply seems to be pushing the interest rate beyond the tolerable level.
iii. Capital market regulators should be at alert for possible just-in-time intervention where capital market activities are causing retrogressive effect on the interest rate beyond the tolerable point.
iv. Government should continue to churn out more strategic policy that would further open up its border for more productive trade relations with other countries.

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