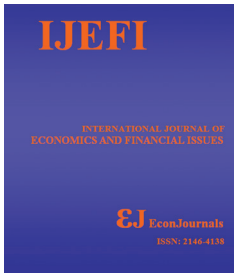

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# Financial Liberalization and Economic Growth in Nigeria: An Empirical Evidence

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**ABSTRACT**

The liberalization thesis has generated a lot of debate in theoretical and empirical literature. In this paper we construct an index of financial liberalization from 1981 to 2012 to investigate its impact on economic growth in Nigeria using the McKinnon–Shaw framework. The ordinary least squares methodology and cointegration analysis are adopted in the study. The result reveals that financial liberalization (FINDEX) and private investment (PINV) have significant positive impact on economic growth in Nigeria. However, real lending rate (LDR) proved to be negatively related to economic growth in Nigeria within the period under review. We therefore conclude that the monetary authorities and policy makers in Nigeria need to support the liberalization process by formulating complementary policies and financial sector reform measures that will help in strengthening the impact of the liberalization process on the economy and also ensure that the benefits of the liberalization exercise is maximized.

**Keywords:** Financial Liberalization, Lending Interest Rate, Private Investment, Economic Growth
**JEL Classifications:** B26, D53, E44, F43

## 1. INTRODUCTION

Liberalization, literally, means the "removal of controls." When we talk about financial liberalization, we refer to the removal of controls and restrictions placed on the financial sector by a governing authority. Financial liberalization gained attention in the early 1970s due to the seminal work of McKinnon (1973) and Shaw (1973) in which they argued that liberalization of the financial sector will lead to increase in savings, encourage investments and induce economic growth. Hence, many countries especially developing countries have embraced financial liberalization as the way forward for their economies. Financial liberalization became a useful and important monetary policy in many countries following the directive from the "Washington Consensus" or "Bretton Woods."

Financial repression, as argued by McKinnon (1973) and Shaw (1973) is the existence of interest rates ceilings, high reserve ratios, regulated lending, restriction to entry and exit in the banking activities, restriction of foreign currency transactions and directed ceilings in an economy. In summary, it is when the government imposes control over financial sector activities and it will cause a decrease in savings, discourage investment, and lack of investment in an economy will lead to a retarded economic growth. They argued that financial liberalization is the way forward in an economy especially a developing economy. This thesis gained a lot of attention as many developing economies liberalized their respective financial sectors following the directive of the Bretton Woods Institutions and the Washington Consensus. The International Monetary Fund, and the World Bank also made it part of the economic policy prescription by developing a programme called "structural adjustment programme (SAP)" aimed at liberalizing distressed economies.

Nigeria, prior to liberalization of the financial sector, had a repressed financial sector in which the government and the Central Bank of Nigeria (CBN), restricted and controlled the activities of the financial sector. However, following the adoption of SAP, Nigeria liberalized her economy in August 1987. This policy initiative commenced with the liberalization of interest rates. Apart from the liberalization of interest rates, the reform also involved promotion of market-based system of credit allocation, enhancing

competition, and efficiency of the regulatory and supervisory framework (Jegede and Mokulolu, 2004; Agu et al., 2014). The adoption of this economic package was motivated by the need to proactively put the Nigerian banking industry and the economy at large on the path of global competitiveness. Interest rate liberalization which was the first financial reform to be undertaken was aimed at enhancing the ability of banks to charge market-based loan rates and hence guarantee the efficient allocation of scarce resources (Ikhide and Alawode, 2001). Other aspects of liberalization followed the liberalization of interest rates subsequently.

As it were, the performance of the Nigerian economy which is reflected by the growth rate of the Nigerian gross domestic product (GDP) shows that the economy has been fluctuating since 1960 when Nigeria got her independence. For example, from 1960 to 1980, GDP grew at an average of 4.06%. However, Nigeria experienced some negative growth rates of −8.75% and −10.75% in 1986 and 1987 respectively. This was during the period of the liberalization or SAP. A negative growth rate of −1.05% and −5.0% was also observed between 1982 and 1983 respectively shortly before the SAP. There was relative improvement in the growth rate of the GDP in the years following the implantation of the SAP. Thus, the Nigerian GDP grew at 7.5%, 6.4% and 12% in 1988, 1989 and 1990 respectively. However, between 1991 and 1999, the growth rate of the GDP nosedived and recorded some negative rates and unimpressive positive rates. This was basically as result of several unpopular economic policies adopted by the military government. Following the return to democratic governance, the real GDP (RGDP) growth of the Nigerian economy experienced some level of improvement with the growth rate peaking at 33.74% in 2004. Interestingly, the growth rate has been relatively stable from 2006 to 2012. This is depicted in Figure 1 which shows the growth rate of RGDP in Nigeria from 1982 to 2012.

After the adoption of the SAP in 1986, and the implementation of the financial liberalization policy of the government in 1987, the number of banks in the country increased from 40 in 1985 to 120 by the end of 1992 which is a 200% increase from 1985 to 1992, then it declined by 31% in 1998 which is from 120 to 89 in 1998. It further declined to 24 showing a 73% decrease in the number of banks (through bank mergers and acquisitions) in 2006 following consolidation exercise by the CBN. The exercise required that all licensed banks should increase their capital base from N2 billion to N25 billion with effect from January 1, 2006 in order to further strengthen the financial sector. However, in August 2009, the CBN conducted an audit examination on these 24 banks based on: liquidity, capital adequacy, and corporate governance. They found 8 banks to be insolvent and 2 were asked to recapitalize. Consequently, the CBN injected N620 billion into the 8 insolvent banks as liquidity support. Later on in March 2010, CBN announced plans to dismantle the exclusivity of universal banking in Nigeria. CBN planned to categorize banks depending on their function and varying capital base as opposed to the existing requirement of N25 billion minimum capital base. CBN categorized banks into regional banks (with capital base of not less than N10 billion), National Banks (with capital base of not less than N25 billion) and international banks (with capital base of not less than N50 billion). Regional banks cannot operate outside their regions, national banks cannot operate outside the country and international banks operating internationally with each category obtaining different licenses.

Financial liberalization according to theory is meant to foster economic growth through increase in savings via an increase in real deposit rate and increase in private investment in high priority sectors, but how this policy has contributed the growth of the Nigerian economy remains an empirical question. Against this background therefore, the basic thrust of this paper is to empirically investigate the impact of financial liberalization on the performance of the Nigerian economy using the McKinnon–Shaw model. Specifically, the study investigates the impact of financial liberalization on economic growth in Nigeria, using the McKinnon–Shaw framework.

The rest of the paper is structured as follows: section two briefly reviews the literature, section three discusses the methodology, section four presents the analysis and interpretation of findings and section five provides the conclusion and recommendations.

## 2. LITERATURE REVIEW

### 2.1. Review of Theoretical Literature

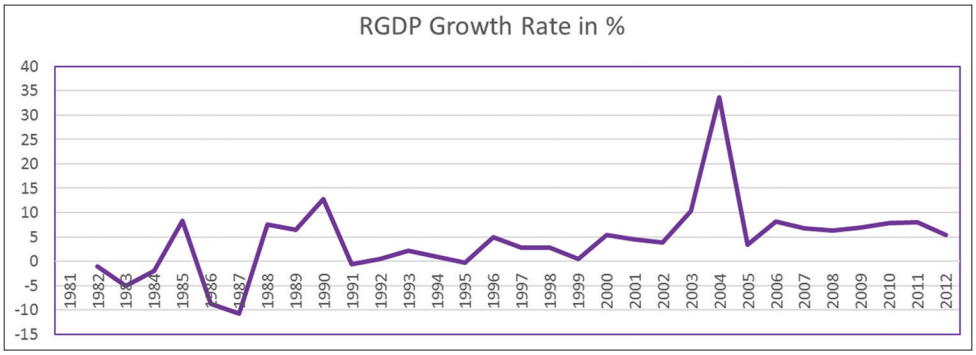
#### *2.1.1. Theory of financial repression and liberalization*

##### *2.1.1.1. The McKinnon–Shaw hypothesis (1973)*

McKinnon (1973) and Shaw (1973) postulated that in a developing country especially, when interest rate is liberalized, it will lead to increase in the real interest rate which will lead to increase in savings, spur investments and eventually lead to economic growth. The initial framework of McKinnon (1973) and Shaw (1973) focused on financial repression and the need to alleviate financial repression through allowing the market to determine real interest rates, removal of credit control among others. The outcome of repression, according to McKinnon (1973) and Shaw (1973) will be low savings, high consumption, low investments and repressed economic growth. The McKinnon–Shaw framework is centered on the distortions in the market caused by financial repression (Savanhu et al., 2011).

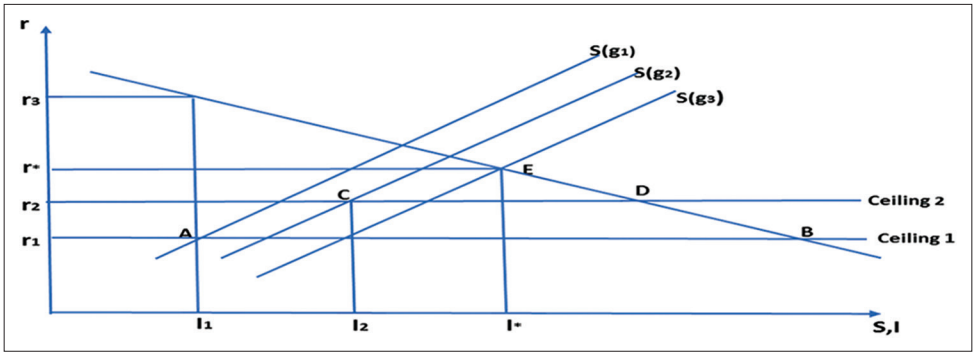
Figure 2 explains the interaction of the market forces in the money and capital market. As can be seen, an increase in interest rate will increase the efficiency of investment and increase in investment causes an increase in economic growth. When an economy is in extreme repression as when the interest rate is set at ceiling 1, the amount saved and invested will be $I_1$ at A and the economy will be at $S(g_1)$. The interest rate ceiling will cause a shortage of funds and credit in the market i.e., the distance between A and B, thus leading to credit rationing. If this ceiling is on deposit rates, then banks will profit from the margin between $r_1$ and $r_3$. When the economy experiences a bit of financial liberalization when interest rate moves to $r_2$ and interest rate ceiling to ceiling 2. At $r_2$, savings and investment increase to $I_2$ at point C, thus leading to a rise in economic activities causing growth and the economy will be at $S(g_2)$. At $r_2$, the credit shortage has a smaller magnitude (i.e., from C to D) in relation to when at $r_1$. When full financial liberalization is realized i.e. when market forces are given free

**Figure 1:** Growth rate of gross domestic product in Nigeria, 1982-2012




Source: Researchers from CBN Statistical Bulletin

**Figure 2:** Financial repression, savings and investment




Source: Savanhu et al., 2011

rein to determine interest rate. The equilibrium interest rate will be at $r^*$ causing the amount of savings and investment is at I* which is at point E. The increase in investment will give rise to an increase in the volume of economic activities causing economic growth at $S(g_3)$.

Thus, McKinnon–Shaw framework argues that in order for an economy to experience economic growth via greater efficiency in capital accumulation and allocation, interest rate and ceilings, credit control and other restrictive financial legislations should be removed.

According to Rehman and Gill (2013), the important point of McKinnon's hypothesis is that an increase in the desired rate of capital accumulation (private savings) at any given level of income leads to an increase in the average ratio of M/P to income implying that a rise in return on capital leads to an increase in the need of real cash balancing holding for accumulation purpose. Thus, money is not a competing asset; rather money is conduit through which accumulation takes place in developing countries. This implies that an increase in real return on money can sharply raise investment saving propensities in developing countries.

Shaw (1973), proposed the "debt-intermediation hypothesis" whereby expanded financial intermediation between savers and investors resulting from financial liberalization (higher real interest rate) and financial development increases the incentive to save and invest, stimulates the investment due to increased supply of credit and increased level of average efficiency of investment. For Shaw, the investment (I) is a decreasing function of real interest rate ($r$) and the saving is an increasing function of economic growth rate ($g$) and real interest rate ($r$). i.e.,

$$I = I(r)$$

$$S = S(r, g)$$

Where $\frac{\partial(I)}{\partial(r)} < 0$; $\frac{\partial(S)}{\partial(r)} > 0$; and $\frac{\partial(S)}{\partial(g)} > 0$

He further argued that increased financial intermediation provided the impetus for growth more directly. Liberalization would result in an expanded, improved and integrated financial sector that would lead to an increase in the savings rate, an increase in the rate of investment (by facilitating more lumpy investment); and a direct enhancement to growth (by improved financial technologies).

Hence, McKinnon–Shaw (1973) viewed financial liberalization as

1. Market-determined interest rates;
2. Greater ease of entry into the banking sector to encourage competition;
3. The elimination of directed credit programmes;
4. Reduced fiscal dependence of the state on credit from the banking system (to allow for greater expansion of credit to the private sector);
5. The integration of formal and informal markets;
6. A movement towards equilibrium exchange rates and, eventually, flexible exchange rate regimes with open capital accounts (Serieux, 2008).

McKinnon (1973) and Shaw (1973) further assert that higher real interest rate also aid the channeling of funds to the most productive enterprises and facilitate technological innovation and development. This they explain that paying an interest rate that is above the marginal efficiency of investment, can induce some entrepreneurs to disinvest from inferior processes to improved technological processes and high yielding enterprises. Thus generating new positive net savings which is important for reducing foreign dependence and stimulating more investment and consequently growth.

However, Fry (1995) identified five prerequisites for successful financial liberalization:

1. Adequate prudential and supervision of commercial banks, implying some minimal levels of accounting and legal infrastructure
2. A reasonable degree of price stability
3. Fiscal discipline taking the form of a sustainable government borrowing requirement that avoids inflationary effects
4. Profit-maximizing, competitive behaviour by the commercial banks
5. A tax system that does not impose discriminatory explicit or implicit taxes on financial intermediation.

This suggests that financial liberalization crucially depends on the assumption of perfect information and perfect competition (Arestis and Demetriades, 1999).

### *2.1.2. Economic growth theories*

Economic growth being one of the macroeconomic goals of any country has studies that has a wide range of years, yet there has not being a unified thought on how it is accounted for.

#### *2.1.2.1. The neoclassical growth model (Solow–Swan model of economic growth)*

The neoclassical growth model of Solow and Swan (1957) provide a conventional framework for analyzing economic growth as it seeks to understand the determinant of long-term economic growth rate through accumulation of factor inputs such as physical capital and labour. According to this model, the role of technological change is very crucial, even more important than the accumulation of capital.

The neo-classical model of economic growth assumes an aggregate production function which exhibits constant returns to scale in labour; reproducible capital; one composite commodity is produced; output is regarded as net output after allowance for capital depreciation; labour and capital are paid according to their marginal physical productivities; flexibility of prices and wages; full employment of the available stock of capital; diminishing returns as capital and labour increases. It implies that economies will conditionally converge to the same level of income, given that they have the same rates of savings, depreciation, labor force growth, and productivity growth. The model is given as:

$$Y = f(K, L)$$

$$Y = AK^{\alpha} L^{(1-\alpha)}$$

Where, $K$ = Capital, $L$ = Labour

The model shows that with variable technical coefficient, there will be tendency for capital - labour ratio to adjust itself through time in the direction of equilibrium ratio. It posits that a long run per capita growth rate depends entirely on the exogenous rate of technological progress. Increase in savings rate will lead to a temporary increase in per capital K/L and per capita output. However, both would return to a steady-state of growth at higher level of per capita output. Increase in savings rate will lead to a temporary increase in per capital K/L and per capita output. Savings has no impact on long-run per capita output growth rate but has an impact on long-run level of per capita output.

The sources of growth measurement highlights the different importance of capital accumulation and technological change in economic growth. An obvious limitation of the Neoclassical model is its failure to account for the cause of technological progress; although the model regards technology as a driver of economic growth, the rate of technological progress is however exogenously determined.

#### *2.1.2.2. Harrod–Domar model*

Harrod (1939) and Domar (1946) viewed development as product of the real sector development. Their model is used to explain economic growth rate in terms of the level of savings and productivity of capital especially in economies with large and rapidly growing population. The principal strategy for development according to the Harrod–Domar model is mobilization of saving and generation of investment to accelerate economic growth. In this model, economic growth rate ($g$) is viewed as direct function of savings ratio ($s$) and an inverse function of the capital-output ratio ($r$). Thus

$$g = \frac{s}{k}$$

According to this model, they are three types of growth: warranted growth (rate of growth at which producers would be compensated with what they are doing i.e., that satisfies the profit taste), actual growth (this is the actual rate an economy grows) and natural rate of growth (this is the rate of growth at full employment which is determined and allowed by the increase in population and rate of technological progress).

The model depicts that an economy does not find full employment and stable growth rates naturally. It concludes that while savings and investment is a necessary condition for accelerated economic growth, it is not a sufficient condition. However, like the neo classical model, while savings is the driver of the economy, it fails to explain what determines savings as it is treated as an exogenous variable.

#### *2.1.2.3. Endogenous growth theory*

The limitation of the neoclassical growth model and the Harrod–Domar growth model was improved upon by the endogenous growth model developed in the 1980s which emerged primarily as an attempt to encompass the sources of technological progress and hence of sustained productivity growth within the general

equilibrium framework of neoclassical growth theory (Ogujiuba and Adeniyi, 2005). It holds that economic growth is primarily the result of endogenous and not exogenous factors. It holds that investment in human capital, innovation, and knowledge are significant contributors to economic growth. The endogenous growth model is mostly due to Romer (1986) who observed the classical and neoclassical theories as an over simplification of what is really a complex process. The endogenous growth model holds that investment in human capital, innovation and knowledge are significant determinants of economic growth. In addition to this, the model focuses on positive externalities and spillover effects of a knowledge-based economy which can lead to economic growth. The model can be written as:

$$Y = A(R) f\left(R_j K_j L_j\right)$$

Where $Y$ = Output growth

$K_j$= Stock of physical and human capital

$R$ = Aggregate stock of knowledge

$L_j$= Stock of labour

$R_j$= Stock of research and development expenditures

A country with initial higher level of $K$, experiences a higher rate of growth as human capital has increasing returns to scale, leading to a higher level of growth of capital income. The rate of growth depends on the type of capital a country invests in.

*2.1.2.4. Schumpeterian growth (1912)*

Schumpeterian growth named after a 20th century Austrian economist Joseph Schumpeter explains growth by innovation as a process of creative destruction that captures the dual nature of technological progress i.e., in the process of creation new products, they make old technologies and products obsolete. This is the destruction referred to by Schumpeter, which could also be referred to as the annulment of previous technologies, which makes them obsolete.

*2.1.2.5. Financial development and economic growth theory*

This theory is of the view that financial development is a major determinant of economic growth. The advocates for this view which include McKinnon (1973), Shaw (1973), Kapur (1976) and Fry (1978) maintained that financial development play a key role in the process of economic growth. Specifically, they advocated for a liberal financial system in order to mobilize increased volume of financial saving and allocate it to productive investment, thereby contributing to economic growth. They proposed that a repressed financial sector will hamper development in ways such as: low savings rate, inefficient financial intermediaries, and restrictive financial policies for credit facilities and investment hence retarding economic growth.

While a contrasting view point proposed by economists like Keynes (1936), Singh (1997) and Krugman (1998) state that financial development is an obstacle to economic growth because of the inherent instability in the financial system. This school of thought argued that there is a role for government intervention in the working of financial markets which is in sharp contrast to the work of McKinnon and Shaw (1973) where it was argued that state intervention in formal markets leads to their repression and therefore, stunts economic growth.

## 2.2. Review of Empirical Literature

### *2.2.1. Review of empirical literature on interest rate liberalization and economic growth*

Several strands of literature have emerged with mixed conclusions and results on the impact of financial liberalization and financial sector reforms on economic growth in various economies. In this section we shall review some of those studies and their major findings.

Bashar and Khan (2007) in their econometric study of Bangladesh evaluated the impact of liberalization on the country's economic growth by analyzing quarterly data from 1974Q1 to 2002Q2 using co-integration and error correction method. The results showed that the real interest rate is negative and significant, implying that Bangladesh's economic growth had experienced the negative effect of liberalization. Hence, refute the McKinnon–Shaw hypothesis.

Ozturk (2008) reviewed the literature on finance-growth nexus and investigate the causality between financial development and economic growth in Turkey for the period 1975-2004. The empirical investigation is carried out in a vector autoregression framework based on the theory of cointegration and error-correction representation of cointegrated variables. Empirical findings in the paper show two-way causality (bidirectional) between financial development and economic growth.

Asamoah (2008) examined financial liberalization and its impact on savings, investment and the growth of GDP in Ghana. The study made use of monthly data on savings and interest rates, as well as seasonal and yearly dummy variables. Using the ordinary least square (OLS) regression analysis, the results showed that the increase in interest rate over the post-liberalization years of the financial sector had led to a corresponding increase in savings which in turn had a positive impact on the growth of GDP. It showed that financial liberalization has increased the rate of capital accumulation and improved efficiency in capital utilization which is both essential for economic growth.

Acaravci et al. (2009) review the literature on the finance-growth nexus and investigate the causality between financial development and economic growth in sub-Saharan Africa for the period 1975-2005. Using panel co-integration and panel generalized method of moments estimation for causality, the results of the panel co-integration analysis provide evidence of no long-run relationship between financial development and economic growth. The empirical findings in the paper show a bi-directional causal relationship between the growth of RGDP per capita and the domestic credit provided by the banking sector for the panels of 24 sub-Saharan African countries. The findings imply that African countries can accelerate their economic growth by improving their financial systems and vice versa.

Banam (2010) analyzed the impact of financial liberalization on economic growth in Iran and also investigated the determinants of economic growth. The results showed that financial liberalization has positive and statistically significant impact on economic growth measured by the GDP in Iran. And hence support the financial liberalization theory.

Adamopoulos (2010) investigated the relationship between financial development and economic growth for Ireland for the period 1965-2007 using a vector error correction model (VECM). The results gotten implied that economic growth has a positive effect on stock market development and credit market development taking into account the positive effect of industrial production growth on economic growth for Ireland.

Bouzid (2012), tested for empirical evidence to verify the complementarity hypothesis for the Arabic Maghrebean countries from 1973 to 2003. The money demand and investment function were estimated in static long-run formulations (cointegration regression) as well as in the dynamic formulation (VECM). The coefficient of the investment ratio in the money demand function (M2/P) were positive only for Algeria. Their findings supported Laumas (1990), Thornton (1990), Thornton and Poudyal (1990). In conclusion, the hypothesis only checked for Algeria, but did not check for Morocco and Tunisia. Thus, the study concluded that the hypothesis are valued if the financial system is well developed and structured.

Muhammad and Malarvizhi (2014) examined the linkage among financial liberalization on economic growth and poverty reduction in six sub-Saharan African countries using panel unit root and panel vector error correction tests over the period of 1980-2010. The results showed that poverty reduction was positively related to economic growth and financial liberalization coefficients are positively related to economic growth. Thus, it implies that financial liberalization causes economic growth. The coefficients of financial liberalization was found to be insignificant to poverty reduction suggesting that financial liberalization does not have direct impact on poverty reduction in the six Sub-Saharan African countries, hence, implying that the financial liberalization effects of poverty are dependent on the distributional changes made possible by the growth and the existence of good governance and strong institutions.

Other studies that use different indicators to measure impact of financial liberalization and financial sector reforms on some macroeconomic variables include; Faria et al. (2009) for Brazil; Fry (1980) for seven Asian countries; King and Levine (1992) for cross-section of 80 countries; Laurenceson and Chai (1998) for China; Sinha and Macri (2001) for eight Asian countries; Pentecost and Moore (2004) for India; Rehman and Gill (2005) for Pakistan; Abu-Bader and Abu-Qarn (2005) for Egypt; Tokat (2005) for Turkey andj India.

In Nigeria, Akpan (2004) conducted a study to theoretically and empirically explore the effect of financial liberalization in the form of an increase in real interest rates and financial deepening (M2/GDP ratio) on the rate of economic growth in Nigeria using the endogenous growth model. The finding showed that although interest rate liberalization has a positive impact, it is unlikely to expedite economic growth alone. Fowowe (2008), conducted an empirical evaluation of the impact of financial liberalization on Nigeria's economic growth and found out that liberalization has exerted a significant positive effect on growth in the long run, thus lending credence to the views that even though financial liberalization might result in financial fragility in the short run, it is growth-enhancing in the long run.

Obamuyi (2009) examined the relationship between interest rates liberalization and economic growth in Nigeria. Using annual data from 1970 to 2006 while applying a co-integration and error-correction model, he showed that the real lending rates have a significant effect on economic growth and there exists a long-run relationship between economic growth and interest rate liberalization. He also confirmed a positive relationship between interest rates and investment and between investment and economic growth. Hence confirming the results of Fowowe (2009) that interest rate is growth enhancing in the long-run.

Okpara (2010) also investigating the effect of financial liberalization on some macroeconomic variables in Nigeria; RGDP, financial deepening, gross national savings, foreign direct investment and inflation rate were selected and given pre/post liberalization comparative analysis using the discriminant analysis technique. The pre-liberalization period covers 1965-1986 while the post-liberalization period continued from 1987 to 2008. The findings show that the variable that impacts most on the economy owing to financial liberalization is the RGDP which recorded the highest contribution. Thus confirming previous studies that financial liberalization has a positive effect on the growth of the economy of Nigeria.

Obamuyi and Olorunfemi (2011) investigated the implications of financial reforms and interest rate behavior on economic growth in Nigeria. Making use of cointegration and ECM data from 1970 to 2006, they found out that financial reform and interest rates have significant impact on economic growth in Nigeria which implies that the behaviour of interest rate is important for economic growth. This is similar to the finding of Orji (2012).

Sulaiman et al., (2012), investigated the effect of financial liberalization on the economic growth in Nigeria using financial deepening (M2/GDP) and degree of openness as financial liberalization indices, the findings showed that there exists a long-run equilibrium relationship among the variables. The study concluded that financial liberalization has a growth-stimulating effect on Nigeria and recommended that economic stability should either be maintained or pursued before implementing any form of financial liberalization measures and the regulatory and supervisory framework for the financial sector should be strengthened.

Omankhanlen (2012), examined the financial sector reforms and its effect on the Nigerian Economy. Employing the OLS method and covering the period 1980-2008, it showed a positive impact on the economy of Nigeria even though the lending rate

is still so far unstable. Hence, the author concluded that the financial sector reforms in the financial sector are not solely responsible for the sector being better off. Also, Owusu and Odhiambo (2013) employed the autoregressive distributive lag-Bounds testing approach to study the impact of financial liberalization on economic growth in Nigeria, between 1969 and 2008. They found long-run relationship between economic growth and financial liberalization represented by an index calculated using principal component analysis. They substantiated the results from Omankhanlen (2012), that financial liberalization policies have a positive and significant effect on economic growth in Nigeria – both in the short run and in the long-run.

## 3. RESEARCH METHODOLOGY

### 3.1. Theoretical Framework

McKinnon (1973) argues that complementarity links the demand for money directly and positively with the process of physical capital accumulation because the conditions of money supply have a first order impact on the decisions to save and invest. McKinnon also argues that positive and high interest rates are necessary for the accumulation of money balances and complementarity with physical capital accumulation will exist as long as real interest rate does not exceed real return on capital. The McKinnon model can be represented as

$$(\frac{M}{P})d = f(Y, r, d\text{-}\pi^*) \quad (1)$$

$$(\frac{I}{Y})p = f(r, d\text{-}\pi^*) \quad (2)$$

Where,

$(\frac{M}{P})d$ = demand for real money balances

$Y$ = Real GDP

$\frac{M}{P}$ = Real money balances

$(\frac{I}{Y})p$ = Ratio of private investment to GDP

$d\text{-}\pi^*$ = Real deposit rate

$r$ = Real return on physical capital

$\pi^*$= Expected inflation rate

McKinnon's complementarity hypothesis requires the partial derivatives

$$\frac{\partial(\frac{M/P}{P})}{\partial(\frac{I}{Y})} > 0 \quad (3) \text{ and}$$

$$\frac{\partial(\frac{I}{Y})}{\partial(d - \neq^*)} > 0 \quad (4)$$

Equations (3) and (4) suggest that it is not the cost of capital but the availability of finance that constrains investment in financially repressed economies. When the real deposit rate increases, investment increases as well because the financial constraint is relaxed. However, the traditional theory suggests the reverse, that is, that an increase in interest rate reduces investment.

### 3.2. Model Specification

#### *3.2.1. Model*

From the above theoretical framework, we present the econometric model of the impact of financial liberalization on economic growth in Nigeria as:

$$LRGDP_t = \gamma_0 + \gamma_1 LDR_t + \gamma_2 PINV_t + \gamma_3 REXR_t + \gamma_4 INFL_t + \gamma_5 FINDEX_{it} + \mu_t$$

The ECM is given as:

$$\Delta LRGDP_{t-1} = \gamma_0 + \gamma_1 \Delta LDR_{t-1} + \gamma_2 \Delta PINV_{t-1} + \gamma_3 \Delta REXR_{t-1} + \gamma_4 \Delta FINDEX_{it-1} + \gamma_5 \mu_{t-1} + \varepsilon_t$$

Where, $LRGDP_t$ = Log of RGDP, a proxy for economic growth

REXR = Real exchange rate

PINV = Private investment as a ratio of GDP

LDR = Real lending interest rate

$\Delta$ = Difference operator

$FINDEX_i$ = Financial liberalization index

Financial liberalization index is used to show the effect of the financial liberalization on the various endogenous variables studied. Nigeria started its financial sector liberalization in 1987, hence we assign 0 to each of the eight financial sector variables prior to the liberalization and 1 as value for the post-liberalization years of each of the individual sectors. FINDEX is gotten via the addition of the various values for the financial sector variables liberalized in each year. This can also be seen in Fowowe (2008).

$\varepsilon_t$ = Error term

$\mu_{t-1}$ = Lagged error term

### 3.3. Estimation Technique

This research employed the OLS method of estimation attributed to a German philosopher, Carl Friedrich Guass. This method is adopted because of the best linear unbiased estimators properties of the estimators i.e., the estimators are linear, unbiased and efficient (Gujurati and Damodar, 2009). The analysis was done with Stata 11 and Microsoft Excel.

### 3.4. Nature and Sources of Data

The data employed in this study are secondary data. The study employed annual time series data from 1981 to 2012. The data series were gotten from The CBN statistical bulletin of various years and the World Bank development indicators.

## 4. ANALYSIS, PRESENTATION AND INTERPRETATION OF RESULTS

### 4.1. Unit Root Test Results

From the Table 1, all the variables are integrated of order 1 apart from LDR.

### 4.2. Cointegration Test Result

To test for cointegration, the augmented Engle–Granger test which is simply applying augmented-Dickey fuller (ADF) to the residual of the regression was used to determine whether there exists a long-run relationship between the dependent variable (PS) and the independent variables.

Test of hypothesis: $H_0$: δ=0 (there is no co integration)

Decision rule: Reject $H_0$ if $|ADF_{cal}|>|ADF_{tab}|$, do not reject otherwise at 5% level of significance.

According to the results obtained (Table 2), we find evidence of the existence of long run relationship among the variables.

### 4.3. Presentation of Regression Results

According to the results in Table 3, we can see the direct impact of the various variables (real lending rate, credit to private sector, private savings, real exchange rate (REXR) and financial index) on economic growth in Nigeria.

The intercept or constant is 12.2961. This suggests that if all other variables remain constant, private investment will increase by 12.2961%. The coefficient of real lending rate (LDR) is 0.0013723, indicating that an increase in the real lending rate by 1% will lead to a 0.0014% decrease in economic growth in the long run. This conforms to the a priori expectation. Private investment (PINV) has a coefficient of 0.1788219. This shows that 1% increase in private savings will lead to a relative increase of 0.1788% in economic growth in the long-run, this conforms to the a priori expectation which suggests that an increase in private savings will lead to an increase in economic growth. The coefficient of REXR is 0.0016198 implying that a 1% increase in exchange rate will lead to a relative increase of 0.0016% in economic activities in the country in the long run. This can only be gainful if the increase favours the local currency, otherwise it will be harmful to the economy. Financial liberalization index (FINDEX) coefficient is 0.061917. This means that the liberalization exercise has a positive impact on economic growth in Nigeria in the long run model. That means that 1% increase in FINDEX causes economic growth to increase by 0.0619% within the period under review. This supports the priori expectation of the McKinnon–Shaw hypothesis.

**Table 1: Unit root test results**

| Variable | ADF-statistic | 5% critical value | Level of integration | Decision |
|---|---|---|---|---|
| LRGDP | −4.083 | −2.986 | I (1) | Stationary |
| LDR | −5.691 | −2.983 | I (0) | Stationary |
| PINV | −5.683 | −2.986 | I (1) | Stationary |
| REXR | −4.457 | −2.986 | I (1) | Stationary |
| FINDEX | −5.363 | −2.986 | I (1) | Stationary |

ADF: Augmented Dickey-fuller

**Table 2: Cointegration test results**

| Variable | ADF-statistic | 5% critical value | Level of integration | Decision | Conclusion |
|---|---|---|---|---|---|
| Model Residual | −3.696 | −2.983 | I (0) | Stationary | Co-integrated |

ADF: Augmented Dickey-fuller

**Table 3: Regression results**

| Dependent variable - LRGDP | | | | |
|---|---|---|---|---|
| Variable | Coefficient | Newey-West STD. ERROR | t-statistic | *P* |
| LDR | −0.0013723 | 0.0045334 | −0.30 | 0.764 |
| PINV | 0.1788219 | 0.0172678 | 10.36 | 0.000 |
| REXR | 0.0016198 | 0.0003772 | 4.29 | 0.000 |
| FINDEX | 0.061917 | 0.0087047 | 7.11 | 0.000 |
| Constant | 12.2961 | 0.0306314 | 401.42 | 0.000 |
| $R^2$=0.9448 | | | *F*-stat=310.77 | |
| Adjusted $R^2$=0.9366 | | | *P* (*F*-stat)=0.0000 | |

#### *4.3.1. Adjusted $R^2$ (co-efficient of determination)*

The $R^2$ is 0.9366. This means that the explanatory variables account for 93.66% of the variations in the dependent variable. Thus, the model possesses a very good fit.

### 4.4. Error Correction Test

The coefficient of the error term lag (1) which is the ECM shows the speed at which the dependent variable adjust to equilibrium in the short run. According to a priori expectations, the ECM should be significant and negative to show that the error in the previous period has been corrected and the model has returned back to equilibrium.

From the results in Table 4, the ECM coefficient is negative as required and significant. This implies that the model adjusts to equilibrium in the short run. Hence, it shows that the financial liberalization exercise adjusts in the short-run to correct the discrepancies and disequilibrium in economic growth. The speed of adjustment is 36.97% within each period.

## 5. CONCLUSION AND POLICY RECOMMENDATIONS

This research was carried out to investigate the impact of financial liberalization on economic growth in Nigeria using the framework of the McKinnon–Shaw hypothesis. Using annual data series from 1981 to 2012 and the OLS technique, the models were estimated and results obtained.

**Table 4: Error correction test results**

| Model: Dependent variable – dLRGDP | | | | |
|---|---|---|---|---|
| **Variable** | **Coefficient** | **Standard error** | ***t*-statistic** | ***P*** |
| dLDR | −0.0026211 | 0.0037774 | −0.69 | 0.494 |
| dPINV | 0.0359135 | 0.0246978 | 1.45 | 0.158 |
| dREXR | 0.0008096 | 0.0004467 | 1.81 | 0.082 |
| dFINDEX | −0.0218909 | 0.0200174 | −1.09 | 0.285 |
| ECM | −0.3696731 | 0.0136513 | −3.25 | 0.003 |
| Constant | 0.0445525 | 0.013333 | 3.26 | 0.003 |

ECM: Error correction model

From the ADF test, all the variables were found to be stationary either at level form or at first difference and all the variables were also found to be co-integrated while using the Engel–Granger co-integration test. The *F* test showed that the variables were jointly significant, while the $R^2$ adjusted were good showing that the variables could explain most of the variation in the dependent variables. Hence, we conclude that the financial liberalization exercise in Nigeria has impacted significantly on the Nigerian economy.

Having investigated the impact of the financial liberalization exercise on economic growth in Nigeria, it is imperative to draw some policy lessons from our results and findings. From our study it is obvious that the McKinnon–Shaw hypothesis holds true for Nigeria but the magnitude of impact still leaves much to be desired. In the light of the above finding we therefore recommend that;

i. To encourage investment in the domestic economy, real lending rates should be kept at a level that will not scare genuine borrowers. This is important because when lending rates are too high, it discourages investors from accessing credits from the banks, and subsequently decreases productive activities in the economy. Also some of those who take the loans at such outrageous rates simply abscond with the money and never invests it. That is why we have several cases of loan defaults in Nigeria today
ii. Government should evolve policies to maintain sound macroeconomic stability and create environment that will help business investments to thrive. A conducive environment is a sine qua non for private investments that will contribute meaningfully to economic growth (Orji et al., 2014)
iii. The monetary authorities should support the liberalization exercise by evolving complementary financial sector reforms. This is a way to ensure that the benefits of the liberalization exercise are maximized.

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