


HAS FINANCIAL LIBERALISATION PROMOTED ECONOMIC GROWTH IN NIGERIA? EVIDENCE FROM AUTO-REGRESSIVE DISTRIBUTED LAG (ARDL) APPROACH



 **Aniekan Okon Akpansung**^{1*}

^{1,2}Department of Economics, Modibbo Adama University of Technology, Yola, Nigeria

¹Email: akpansungani@yahoo.com

 **Shall Erinus Waziri**²



(+ Corresponding author)

ABSTRACT

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This study attempted to ascertain whether or not financial liberalisation policies promoted economic growth in Nigeria for the period spanning 1986 –2014, using Auto-regressive Distributed Lag (ARDL)-bounds testing approach and unrestricted error correction model (UECM) to cointegration analysis. Macroeconomic time series data were obtained from Central Bank of Nigeria (CBN) Annual Statistical Bulletins, National Bureau of Statistics (NBS) Bulletins, and World Bank Development Indices. Three alternative measures of financial liberalisation (FINDEX₁, FINDEX₂, FINDEX₃) and six intervening variables were incorporated into the study. The empirical findings show that the impact of financial liberalization on economic growth varied for different measures of financial liberalization undertaken; and were significant both in the short run and the long run: FINDEX₁ promoted economic growth significantly, and corroborates the growth-stimulating effect of financial liberalization; while FINDEX₂ and FINDEX₃ exerted significant negative impacts on economic growth. Real exchange rate, degree of openness, consumer price index, increase in life expectancy of labour, and debt service ratio significantly influenced economic growth in the short run and long run. None of the measures of financial liberalisation Granger-caused economic growth, but a one-way causation ran from FINDEX₂ to FINDEX₁, and from FINDEX₃ to FINDEX₁. The study recommends increased financial deepening, reduction of lending rates, removal of bottlenecks in the banking and stock markets institutions in Nigeria.

Contribution/Originality: This study contributes to the existing literature by using Auto-Regressive Distributed Lag (ARDL) bounds testing approach and unrestricted error correction model (UECM) to cointegration analysis; and it is the first to incorporate three alternative measures of financial liberalisation to determine their relative impacts on economic growth in Nigeria.

1. INTRODUCTION

Financial liberalization was an appealing policy especially in the 1980's when the less developed counties were pressed by the leading multilateral funding institutions (namely; International Monetary Fund and the World Bank) to abandon their centrally controlled systems and transform them into liberalized entities. Financial liberalisation denotes giving banks and other financial intermediaries more freedom of action, and can be described

in three principal ways, as: (i) domestic financial sector reforms such as privatisation and increases in credit extension to the private sector; (ii) stock market liberalisation, when a country opens up its stock markets to foreign investors, at the same time allowing domestic firms access to international financial markets (Bekaert *et al.*, 2001) and (iii) the liberalisation of the capital account, where special exchange rates for capital account transactions are relaxed (Loots, 2003) where domestic firms are permitted to borrow funds from abroad (Schmukler and Vesperoni, 2006) and where reserve requirements are lowered (Kaminsky and Schmukler, 2003). Generally, the policy involves deregulating interest rates, eliminating or reducing credit controls, allowing free entry into the banking sector, giving autonomy to commercial banks, removing restrictions on foreign financial transactions, permitting ownership of private banks, and removing entry barriers for foreign financial institutions (Odhiambo, 2011; Bumann *et al.*, 2012; Akingunola and Adekunle, 2013; Precious and Asrat, 2014).

Prior to discussion on liberalising the financial markets, government policies, which were focused on restricting and controlling financial markets (i.e., financial repression), consisted of establishing interest rate ceilings, and government directed credit and subsidies to banks, leading to excess demand and inefficient allocation of capital. Both McKinnon (1973) and Shaw (1973) argued in favour of liberalising financial markets on the grounds that this would lead to more saving as well as more efficient investment which, in turn, would lead to higher economic growth rates. Following its large-scale acceptance and adoption by many less developed countries, the Nigerian Government adopted financial liberalization policy under the Structural Adjustment Programme (SAP) of 1986.

However, the global integration, deregulation and improvements in technology, financial systems in world economies, and financial crises have stimulated rethinking on financial liberalization. The US government unveiled a historic rescue plan for bank recapitalization amounting USD 250 billion, of which half of the total were to be injected into 9 major banks including Bank of America, JP Morgan Chase, Wells Fargo, Citi group (Guha and Politi, 2008). Several governments have also nationalized their banks: The Netherlands, Belgium and Luxemburg each bought 49% of 'Fortis' local banking subsidiaries for combined EUR 11.2 billion (Steen and Larsen, 2008) the Swedish government took over Carnegie, the largest investment bank in the Nordic region in order to protect financial stability and to preserve the value of the collateral (Anderson, 2008). All these developments around the world, have further raised question marks regarding the wisdom of the deregulation process of the financial sector and hence the need to reexamine the outcome of financial liberalization in a developing country like Nigeria, which has been affected directly or otherwise by the above global events.

Although the Nigerian financial system experienced radical structural and institutional changes such as phenomenal increase in the number of institutions operating in the sector and the addition of some innovative types during the implementation period (Akpanung and Gidigbi, 2014) it is doubtful whether the financial system showed a significant improvement in its ability to mobilize saving; as the level of savings in the country was rather fairly low. The failure of the financial sector to finance the long term investment required in the real sector of the economy has also been the bane of the nation's economic growth and development. Growth rate of the economy also followed the dwindling behaviour of saving and investment during the period under review. In 1987; GDP growth rate was -0.57% while in 1991 GDP growth rate stood at -0.81%. By 1998; GDP growth rate stood at 0.42% while by 2005 and 2011, it improved to 6.51% and 7.40%, respectively (Alehile, 2014). Output growth in the third quarter of 2014 was 6.23% down from 6.54% in the second quarter (Central Bank of Nigeria (CBN), 2014).

Since McKinnon (1973) and Shaw (1973) prognostications, numerous studies have attempted to document the effects of financial liberalisation on, *inter alia*, economic growth, financing constraints, market integration, capital flows and capital structure. From a theoretical perspective, the nature of the relationship between financial liberalisation and economic growth is ambiguous. Given this theoretical ambiguity, many empirical studies have been undertaken to investigate this contending issue. The general picture that emerges from the empirical literature is that the empirical evidence is still inconclusive (Bumann *et al.*, 2012). For instance, Chile and Argentina in the early 1980s experienced the negative effects of financial liberalisation. The same held for Mexico (in 1994–95) and

the countries affected by the Asian crisis (1997–98). More so, a number of empirical studies that have been conducted on the link between financial liberalization and economic growth had concentrated mainly on Asia and Latin American countries (see (Tokat, 2005; Pentecost and Moore, 2006; Chaudhry *et al.*, 2012)). Less attention was given to sub-Saharan African (SSA) countries. However, the few countries studied had inconclusive results as to the impact of financial liberalization. Some of those studies equally led to disappointing results and in some cases even to economic and financial crises (see, (Diamond and Dybvig, 1983; Demirgüç-Kunt and Detragiache, 1998; Stiglitz, 2000)). Bakare (2011) observed that despite the adoption of financial liberalization, the Nigerian economy has not experienced impressive performance as envisaged; whereas Ujunwa *et al.* (2012) noted that after over two decades of reforms in the financial sector, Nigeria is not one of the countries that may have a success story of financial sector reform positively influencing real macroeconomic activities. Even so, most of the studies focused on the quantity effects of liberalization, while others concentrated on the quality effects of liberalization. These studies use firm-level, as well as cross-country data (Hermes and Lensink, 2005). Some studies also focused more on the use of a bivariate causality test to assess the causal relationship between financial development and economic growth. Here, the fallacy of combination cannot be ruled out. Furthermore, it is now evident that the method of lumping together data on countries that are at different stages of financial and economic development may not adequately solve the country-specific effects.

The specific objectives of this study are threefold: (i) to assess the relationship between financial liberalisation and economic growth in Nigeria (ii) to find out whether the relationship between financial liberalization and economic growth in Nigeria differ for different measures of financial liberalization undertaken; and (iii) to ascertain the direction of causation between financial liberalisation indicators and economic growth in Nigeria for the period spanning from 1986 to 2014.

Apart from contributing to the existing body of knowledge on the impact of financial liberalisation policies on economic growth, the results and recommendations of the study would no doubt help Government policy makers and implementers to be abreast with latest happenings in the Nigerian financial sector. The study uses Auto-Regressive Distributed Lag (ARDL) bounds testing approach and unrestricted error correction model (UECM) to cointegration analysis, which are the recent econometric tools for empirical analysis, and it is also the first to incorporate the three alternative measures of financial liberalisation to determine their relative impacts on economic growth in Nigeria.

The remaining part of this paper is arranged as follows. In Section 2, we present the theoretical framework and empirical literatures review. In section 3, we describe the methodology of the paper while in Section 4 we present and discuss the empirical results. In Section 5, we draw conclusions, and finally present some policy options in Section 6.

2. THEORETICAL FRAMEWORK

Two main economic approaches have been put forward to explicate the relationship between financial liberalisation and overall economic growth, namely; the prior-saving approach and the investment-led approach. The prior-saving approach argues that financial liberalisation encourages economic growth by increasing the amount of loanable funds, increasing credit, and thus increasing investment (McKinnon, 1973; Shaw, 1973). This model stresses the significance and necessity of rules leading to increase saving levels, which would help find investment outlets. This approach also stressed the importance of a liberalized financial system as a means of increasing saving, investment and the productivity of investment. It strongly opposed any kind of government intervention in the financial system and criticized the argument that market forces do not work in less developed countries (Shaw, 1973).

In the investment-led approach, a post-Keynesian argument concerning the financial liberalization model is that investment is not supply-determined but, on the contrary, the level of investment is what determines savings

via the income multiplier effect (Davidson, 1986; Burkett and Dutt, 1991). They argue that high real interest rates negatively affect economic performance by discouraging both aggregate consumption and investment, therefore reducing the level of aggregate demand. The Neo-Structuralist approach, which remains within the prior-saving analytical framework, argues that financial liberalization might reduce the amount of loanable funds for the whole financial system, including those of the unofficial money and capital markets (World Development Report, 1989). From the Washington consensus' perspective, financial repression was understood as a situation in which government and Central Bank regulations tend to distort financial markets. These regulations mainly refer to reserve requirements on commercial banks, interest rates ceilings and compulsory credit allocations with or without subsidized interest rates. It was argued that the consequences of financial repression constrained the growth of savings, investment and economic performance (García-Páez and Dela-Cruz, 2012).

However, some studies have opined certain conditions on the effects of financial liberalisation on economic growth, some of which include; Macroeconomic stability (Edison *et al.*, 2002a) Deepening of capital markets (Loayza and Rancière, 2004) Well-functioning financial markets and competition among financial institutions, which in turn leads to the efficient allocation of resources and faster economic growth (Eichengreen and Leblang, 2003) Institutional development (Bonfiglioli and Mendicino, 2004).

2.1. Empirical Literature Review

There are a number of empirical studies that have concentrated more specifically on the impact of financial liberalization on economic performance (Bayoumi, 1993; Bekaert *et al.*, 2000; Henry, 2000). As confirmed by Loizos (2017) the literature on financial liberalisation remains controversial on its theoretical conclusions and policy implications. Sulaiman *et al.* (2012) explored the effect of financial liberalization on the economic growth in developing nations with particular focus on Nigeria with annual time series data from 1987-2009. The study employed co-integration and error correction model (ECM) by making Gross Domestic Product as a function of lending rate, exchange rate, inflation rate, financial deepening (M2/GDP), and degree of openness as its financial liberalization indices. Co-integration result confirmed the existence of long run equilibrium relationship while the ECM results showed a very high R-squared in both the over-parameterized model (95%) and parsimonious model (91%). The study hence concluded that financial liberalization has a growth-stimulating effect on Nigeria.

In their study, Ranciere *et al.* (2006) decomposed the impact of international financial liberalization on growth into two effects: a positive direct effect and a negative indirect effect through a higher propensity to crisis. They found that the direct growth gain of financial liberalization significantly outweighs the growth loss associated with more frequent financial crises. On average, the effect of financial liberalization on growth was found to be economically sizeable: around 1% increase in per-capita annual growth rate.

Tswamuno *et al.* (2007) asserted that after liberalization in South Africa, doubt on the part of foreign investors owing to lack of a credible macroeconomic framework led to increased volatility of capital flows; evidenced by huge capital inflows and subsequent capital flight. They found no positive effect on economic growth. Worthy to note was that increased post-liberalization stock market turnover had a negative effect on economic growth. In comparison to this scenario, evidence indicated that foreign portfolio investment and increase in turnover contributed positively to economic growth in a government more controlled pre-1994 South African economy. They agreed that liberalization of the capital account was vital but not enough for the expected economic growth. Rather, countries ought to adopt and implement credible macroeconomic policies aimed at stabilizing foreign capital flows so as to enjoy the benefit fully from liberalization.

Lee and Shin (2008) dissected the effects of financial liberalisation into direct and indirect effects. The direct effects are clearly the benefits that arise in terms of the removal of frictions in the markets, thus leading to lower borrowing costs. The indirect effects are the negative impacts leading to crises. Although they found that the probability of crises occurring is two percentage points, the net effect, which combines the direct and indirect

effects, leads to positive economic growth. Nyawata and Bird (2004) warned that the liberalisation of domestic interest rates could lead to excessive borrowing, which may jeopardise profitable investment opportunities.

Singh and Weisse (1998) studied two major aspects of financial liberalization, stock market development and portfolio capital flows in the light of less developed countries (LDCs). Microeconomic and macroeconomic perspectives were considered on their roles for long-term development and economic growth. Their concentrations were on: (a) the role of stock markets in financing corporate growth; (b) the consequences of stock market volatility for resource allocation and productive efficiency; and (c) the relationship between the foreign exchange and stock markets in the light of economic shocks. Recommendations were made that LDCs should promote bank-based systems, motivate the scale and composition of capital inflows, and block a market for corporate control from emerging.

Khan and Qayyum (2006) carried out empirical investigation on the impact of trade and financial liberalization on economic growth in Pakistan. They used annual observations over the period 1961 - 2005. Their analysis hinged on the bound testing approach of cointegration proposed by Pesaran *et al.* (2001). The empirical results indicated that both trade and financial policies had an important role in aiding growth in Pakistan in the long-run. The feedback coefficient signified a sluggish rate of adjustment towards long-run equilibrium. However, estimation of the short-run dynamics was stable, as shown by CUSUMQ test.

Hermes and Lensink (2005) investigated the relationship between financial liberalization on the one hand and saving, investment and economic growth on the other hand, for a sample of 25 developing economies over the period 1973-96. They found that financial liberalization is positively associated with private investment, as well as with per capita GDP growth. Their results suggest that financial liberalization leads to a substitution from public to private investment, which may contribute to higher economic growth. Roubini and Sala-i-Martin (1992) demonstrated that a fraction of weak growth experience in Latin American countries could be explained by financially repressive policies. Eichengreen and Leblang (2003) utilised data set for 21 countries ranging from 1887 to 1997, and they found weak evidence that financial liberalisation leads to growth.

Tokat (2005) assessed the impact of financial liberalization on some macroeconomic variables in two emerging countries (Turkey and India) for the period 1980-2003. Variables used were the changing dynamics of domestic industrial production index, domestic interest rate, and trade-weighted average foreign industrial production index. Multivariate Granger - causality test was carried out. The findings suggested that there was an increased interdependency among the variables following the financial liberalization process. The study provided evidence on the increasing impact of foreign economies on both countries macroeconomic variables which implied that financial liberalization had been beneficial to both countries.

Okpara (2010) posited that investigation on the effect of financial liberalisation on some macroeconomic variables in Nigeria revealed a positive impact on the real GDP because of the financial liberalisation. Macroeconomic variables used (such as real GDP, 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 period for pre-liberalization was 1965 to 1986 while 1987 to 2008 was the post-liberalization period.

Using Johansen Co-integration test and time series data from 1965 through 2005, Banam (2010) examined the impact of financial liberalization on economic growth in Iran. The financial liberalization index was represented by the financial restraints index that included interest rate controls, reserve requirements and directed credit multiplied by -1. The empirical results suggested that financial liberalization had positive and statistically significant impact on economic growth measured by the gross domestic product in Iran. The results supported McKinnon (1973) and Shaw (1973) proponents of financial liberalization.

Bashar and Khan (2007) in their study of Bangladesh to evaluate the impact of liberalisation on the country's economic growth used an econometric diagnosis and analyzed quarterly data from 1974Q1 through 2002Q2. They

used Co-integration and Error Correction Method, using per capita GDP, gross investment as a share of GDP, labour force as a share of population, secondary enrolment ratio, trade openness indicator, real rate of interest and net capital inflows as variables. Their empirical results revealed that the coefficient of the financial liberalization policy variable (real interest rate) was negative and significant; suggestive that financial liberalisation had negative effect on Bangladesh's economic growth.

According to Munir *et al.* (2010) financial liberalization had no positive effects on private credit and investment in Pakistan because interest rate had been negative for some years due to the high inflationary situation. These results were obtained after having examined the short and long run relationship among investment, savings, real interest rate on bank deposits and bank credit to the private sector. These were accompanied with the assignment of the impact of financial liberalization on key macroeconomic variables for the period 1973 through 2007. Co-integration test and Error Correction Method was used to analyze the annual time series data. Financial liberalization was proxied by a dummy variable, taking value 1 for the years of liberalization, i.e., 1990 to 2007; and zero for non-liberalization years, 1973 through 1989. Recommendation for the deregulation of interest rate to mobilize savings to promote capital formation was advocated. There was no evidence to show that financial liberalization made significant impact; despite this, their results positively agreed with the McKinnon-Shaw hypotheses.

Kaminsky and Schmukler (2003) after conducting a cross-country regression analysis on five MENA countries (Egypt, Jordan, Morocco, Tunisia and Turkey) over the period 1970 to 1998 to examine the effect of financial liberalization on growth, found that the result was in agreement with Keynesian view. Estimated growth equation related real GDP to a set of financial depth measures, real interest rate, private investment rate, external debt/GDP ratio, annual change of terms of trade and real exchange rate overvaluation; all proxies for financial liberalization. The fixed-effects estimation was employed which permits each country to have its own intercept. Results obtained suggested that financial liberalization was responsible for further distortion of credit allocation in favour of consumption at the expense of productive activities. This led the financial depth indicators failure to explain growth experience in these countries. The work showed that financial liberalization was in agreement with the Keynesian view and averse to financial development.

Pentecost and Moore (2006) empirically investigated the impact of financial liberalization on economic growth in 10 new European Union countries and Turkey between 1995 and 2007, using panel data for different types of financial flows, like foreign direct investment, other investments, portfolio investments, trade openness index and other control variables. Employing the Ordinary Least Square (OLS) method, their static robust and dynamic panel data estimates indicated clear evidence between the long-run growth and a number of financial liberalization indicators, which confirmed the anticipations of the 'new growth theory'. Their findings took cognizance of financial liberalization as a policy tool, because of its possibility to promote economic growth.

Asamoah (2008) examined financial liberalization and its impact on savings, investment and the growth of GDP in Ghana, using monthly data on savings and interest rates, and yearly seasonal dummy variables instead of post and pre-liberalization. The Ordinary Least Square (OLS) regression analysis was used. The results showed a positive impact on the growth of GDP which was seen in the rise in interest rate over the years after liberalization of the financial sector

Using panel data, Fowowe (2008) assessed the effects of financial liberalization policies in the growth of 19 countries in Sub-Sahara Africa for the period 1978 to 2000. Two indexes and a dummy variable for financial liberalization (assigning value of zero prior to liberalization and 1 after liberalization) were constructed. The control variables were initial income per capita, investment, life expectancy, degree of openness, and the debt service ratio. The study employed both the Fixed Effects and Dynamic Panel Estimator and also Ordinary Least Square Method and Random Effects estimations to assess the sensitivity of the results. Significant positive

relationship between economic growth and financial liberalization policies was observed. The result is an evidence to corroborate the growth-stimulating effect of financial liberalization.

Akpan (2004) theoretically and empirically carried out an investigation to explore the effect of financial liberalization (specifically, 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. He used time series annual data covering the period from 1970 to 2002. For the purpose of both the short and long run impact of the variables in the model, the error correction model (ECM) was used. Low coefficient of the real deposit rate was the result, which meant that interest rate liberalization alone was not enough to expedite economic growth. However, on the whole, the results revealed a positive impact on the economy of Nigeria.

Using meta-analysis as a tool to investigate the financial liberalisation-growth nexus, and based on 441 t-statistics reported in 60 empirical studies, Bumann *et al.* (2012) noted that financial liberalisation policies carried out during the 1970s seemed to have had a stronger negative relationship with growth. Their results also show that studies that took into account a measure of the level of development of the financial system reported lower t-statistics for the relationship between liberalisation and growth.

Owusu and Odhiambo (2013) examined the relationship between financial liberalization policies and economic growth in Ivory Coast. They employed the autoregressive distributed lag (ARDL)-bounds testing approach. Economic growth was measured by real GDP per capita while financial liberalization was represented by an index – calculated, using principal component analysis (PCA). The empirical findings showed that the effects of financial liberalization policies on economic growth were negligible in the short run as well as in the long run. This finding, though contrary to the expectation of the study, was consistent with a number of previous studies in which negative or inconclusive results regarding the effects of financial liberalization on economic growth have been reported.

3. METHODOLOGY

3.1. Definition of Variables

Empirical studies on the effects of financial liberalisation use different measures of this phenomenon, which indicate that there are different views of what captures financial liberalisation. In this study, the primary variables of interest are the three (3) measures of financial liberalisation ((FINDEX1, FINDEX2, and FINDEX3), which we included in the growth equation to measure the impact of financial liberalisation on economic growth. Theoretically, we expect these variables to exert positive impacts on economic growth. The variables required for this study were drawn from the empirical literature on the impact of financial liberalisation on economic growth. The data are defined as follows:

(i) GDP_t = growth rate of real GDP (proxy for economic growth) at time t;

(ii) **FINDEX1** = the first index of financial liberalisation, proxied by private sector credit/GDP ratio ($\frac{PSC}{GDP}$). This

indicator measures financial deepening (the quantity and quality of investment financed by the banking sector). This measure has been used by many researchers as a proxy for financial sector development (King and Levine, 1992; Levine, 1997; Cobbina, 1999; Abu-Badar and Abu-Qarn, 2005; Akerlof, 2007; Gounder, 2007; Akpansung and Babalola, 2012); Pill and Pradhan (1995) and Agu and Chukwu (2008).

(iii) **FINDEX2** = the second index of financial liberalisation is financial depth or financial intermediation ratio or

the size of the financial sector, proxied by banking sector liquidity/GDP ratio ($\frac{M2}{GDP}$). This ratio had been used

by Levine (1997); King and Levine (1993); Calderon and Liu (2003); Demirguc-Kunt and Maksimovic (1998); Serieux (2008) etc.

- (iv) **FINDEX3** = the third index of financial liberalisation is assets with the Central Bank to GDP ratio, demonstrating the importance of all financial services and the strength of financial system of a country. This is proxied by Average Stock Market Capitalisation/GDP; and is used as an indicator of development of stock exchange market.

Based on the reviewed literature, our control variables are: Real Exchange Rate (REX) - the Naira/US dollar exchange rate; Lending rate (LENR); Life expectancy (LFEX), to measure human capital; ratio to measure the

degree of openness (DOP), $\frac{\text{import} + \text{export}}{\text{GDP}}$; ratio to measure macroeconomic uncertainty (DSER),

$\frac{\text{debt service}}{\text{Export}}$; and Consumer price index (CPI).

3.2. Method of Data Analysis

The study adopted the Auto-Regressive Distributed Lag (ARDL) bounds testing approach developed by Pesaran *et al.* (2001) because it yields consistent estimates of the long-run coefficients that are asymptotically normal irrespective of whether the underlying regressors are I(1) or I(0).

3.3. Model Specification

There has been general recognition that financial liberalisation is difficult to measure in a form suitable for econometric analysis and any approach will be less than ideal (Groenewold *et al.*, 2008). The general functional form of the linear regression model adopted in this study is stated as follows:

$$Z_t = \mu_0 + \sum_{i=1}^p \alpha_i Z_{t-1} + \varepsilon_t \quad t = 1, 2, \dots, T \quad (3.1)$$

Where: μ_0 = vector of intercepts; $Z_t = Z_t$ is a vector of X_t and Y_t variables, respectively; α_i = Coefficient factor of X_t variables; ε_t = stochastic error term.

The corresponding Vector Error Correction Model (VECM) for equation (3.1) is derived as expressed in equation 3.2 below; assuming unrestricted intercepts and no trends, Equation 3.1 becomes an unrestricted error correction model (UECM) as:

$$\Delta Z_t = \mu_0 + \beta_i Z_{t-1} + \sum_{i=1}^p \delta_i Z_{t-1} + \varepsilon_t \quad (3.2)$$

Where; Δ represent the first difference operator, γ and δ represents vector matrices that contain the long-run multipliers and short-run dynamic coefficients of the VECM respectively. Z_t is a vector of X_t and Y_t variables respectively, ε_t is a stochastic error term.

Incorporating the variables of interest, the UECM of Equation 3.2 becomes:

4. RESULTS AND DISCUSSIONS

The empirical results of the study obtained from Eviews 8.0 output are presented and discussed in this section as follows:

4.1. Results of the ADF and PP Unit Roots Tests

Stationarity test was conducted using both the ADF and the Phillips–Perron (PP) techniques. The tests were performed at levels and first difference for the intercept and trend term, respectively. A summary of the ADF unit root test result as presented in Table 4.1 showed that FINDEX1, FINDEX2, REX, LENR, LFEX, DOP, CPI, and DSER variables were stationary at level $I(0)$, while RGDP and FINDEX3 variables were first difference-stationary, or integrated of order 1 (or $I(1)$).

Table-4.1. Augmented Dickey Fuller Unit Root Test at Level and 1st Difference

Variable	Level	1 st Difference	5% Critical Value	Order of Integration
LOG(RGDP)	-	-6,794469	-2.918778	I(1)
LOG(FININDEX1)	-4.378900	-	-3.595026	I(0)
LOG(FININDEX2)	-3.588011	-	2.976263	I(0)
LOG(FININDEX3)	-	-6.150351	-2.998064	I(1)
LOG(REX)	-3.192591	-	-2.971853	I(0)
LENR	-3.197680	-	-2.971853	I(0)
LFEX	-4.630215	-	-2.986225	I(0)
DOP	-6.986588	-	-2.971853	I(0)
LOG(CPI)	-4.388852	-	2.991878	I(0)
DSER	-4.555947	-	-2.971853	I(0)

Source: Authors' Computation using E-views 8.

The Phillips–Perron unit root test in Table 4.2 also confirmed the ADF test result. The Phillips–Perron unit root test showed that REX, LENR, LFEX, DOP, CPI, and DSER variables were stationary at level, $I(0)$ whereas FINDEX1, FINDEX2 and FINDEX3 were integrated of order 1. Hence, the PP result corroborated the ADF stationarity test. The results from the stationarity tests indicated that the variables were not integrated of the same order, hence the specified model could be implemented as an ARDL model using bounds testing approach as in Pesaran *et al.* (2001).

Table-4.2. Phillip-Perron Unit Root Test at Level and 1st Difference

Variable	Level	1 st Difference	5% Critical Value	Order of Integration
LOG(RGDP)	-	6-.791688	-2.918778	I(1)
LOG(FININDEX1)	-	-4.564683	-2.976263	I(1)
LOG(FININDEX2)	-	-4.471173	2.976263	I(1)
LOG(FININDEX3)	-	-6.294586	-2.998064	I(1)
LOG(REX)	-3.383419	-	-2.971853	I(0)
LENR	-3.260088	-	-2.971853	I(0)
LFEX	-2.177648	-	-1.374494	I(0)
DOP	-6.091464	-	-2.971853	I(0)
LOG(CPI)	-3.496716	-	-2.971853	I(0)
DSER	-4.549863	-	-2.971853	I(0)

Source: Authors' Computation using E-views 8.

4.2. Bounds Tests Result for Cointegration

The ARDL -Bounds Tests result for Cointegration was extracted in Table 4.3. The null hypothesis of non-existence of cointegration among the variables was rejected, since the calculated F-statistics = 3.106937 at an optimum lag of 9 was higher than the upper bound critical value of 2.99 at 10% significant level. This implies that that there was a long run cointegration relationship amongst economic growth and the variables used in the model.

Table-4.3. ARDL Bounds Test Result for Cointegration

Test Statistic	Value	K (lag length)
F-statistic	3.106937	9
Critical Value Bounds		
Significance level	I(0) Bound	I(1) Bound
10%	1.88	2.99
5%	2.14	3.3
1%	2.65	3.97
Decision:	Cointegration	

Source: Authors' computation from Microfit version 4.

4.3. Estimated Long Run Effects

The long run estimated output as contained in Table 4.4 reveals that all the variables with the exception of lending rate significantly impacted on economic growth in the long run. The signs of the estimated coefficients are summarized as FINDEX1(+), REX (+), DOP (-), CPI (+), DSER (-), FINDEX2(-), FINDEX3(-), LFEX (+). The result implied that there was a significant long run positive relationship between FINDEX1 and economic growth, while FINDEX2 and FINDEX3 significantly impacted economic growth negatively in Nigeria during the study. Specifically, 1% rise in FINDEX1 increased GDP by approximately 0.28 or 28%; 1% rise in FINDEX2 would equally reduce GDP by 0.28 significant point, while, a 1% rise in FINDEX3 would decrease GDP by about 5% significant point.

On the other hand, LENR exerted a negative insignificant effect on GDP. DOP exerted a significant inverse effect, as a 1% rise in degree of openness significantly reduced GDP by 0.67 or 67%. Furthermore, a 1% rise in DSER decreased GDP by 0.001 or less than 1% significant point.

Table-4.4. Long run ARDL Estimated Output

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(FININDEX1)	0.277356	0.073137	3.792271	0.0030
LOG(REX)	0.586384	0.230480	2.544190	0.0273
LENR	-0.015718	0.010192	-1.542215	0.1513
LOG(DOP)	-0.670754	0.250039	-2.682594	0.0213
LOG(CPI)	0.051249	0.009655	5.307883	0.0002
DSER	-0.000896	0.000241	-3.720603	0.0034
LOG(FININDEX2)	-0.280664	0.058651	-4.785314	0.0006
LOG(FININDEX3)	-0.048561	0.013948	-3.481690	0.0051
LOG(LFEX)	7.521587	0.340032	22.120225	0.0000
C	17.075382	1.647853	-10.362200	0.0000

Source: Authors' Computation Using E-views 8.

4.4. Estimated Short-Run Effects Determination

A similar behaviour of the variables of interest in the short run are contained in Table 4.5. It showed that all the variables significantly impacted economic growth in the short run at 1% and 5% levels of significance: 1% rise in FINDEX1 increased economic growth by 0.17 or 17% significant point. FINDEX2 and FINDEX3 impacted negatively on economic growth, as 1% rise in each measure reduced GDP by 0.10 or 10% and 0.03 or 3% significant points, respectively.

Contrary to the long run output; a 1% rise in REX significantly improved economic growth by 0.35 or 35%; a 1% increase in CPI significant reduced GDP by 0.06 or 6%, while a 1% rise in LFEX significantly raised GDP by 4.5 or 450%. On the other hand, LENR exerted a negative significant effect on GDP; a 1% rise in LENR reduced GDP by 0.01 or 1% significant point. DOP exerted a significant inverse effect on GDP, as a 1% rise in DOP reduced GDP by 0.40 or 4%. Furthermore, a 1% increase in DSER reduced GDP infinitesimally by 0.001 (less than 1%).

The coefficient of ECM (-1) was statistically significant and rightly signed, implying approximately 59.9% of disequilibria from a previous year's shock converged back to the long-run equilibrium in the current year.

Table-4.5. Short run ARDL Estimated Output

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLOG(FINDEX1)	0.166195	0.036591	4.542008	0.0008
DLOG(REX)	0.351369	0.122492	2.868497	0.0153
D(LENR)	-0.013370	0.005407	-2.472655	0.0310
DLOG(DOP)	-0.401924	0.131918	-3.046772	0.0111
DLOG(CPI)	-0.056733	0.020179	-2.811459	0.0169
D(DSER)	-0.000537	0.000135	-3.983649	0.0021
DLOG(FINDEX2)	-0.100069	0.023950	-4.178195	0.0015
DLOG(FINDEX3)	-0.029098	0.008518	-3.415913	0.0058
DLOG(LFEX)	4.507029	0.415673	10.842720	0.0000
ECM(-1)	-0.599213	0.068897	-8.697185	0.0000

Source: Author's Computation Using E-views 8.

4.5. Stability of Model Parameters

The stability of model parameters was examined using statistics of Cumulative Sum of Recursive Residuals (CUSUM) and Cumulative Sum of Squares of Recursive Residuals (CUSUMSQ). The former test was used for investigating systematic changes in the estimated coefficients and the latter test was used for examining sudden and accidental changes in stability of the coefficients. Both the CUSUM and CUSUMSQ plots indicated stability in the coefficients over the sample period as both graphs fall within the critical region (see Figures 4.1 and 4.2). The finding corroborates (Khan and Qayyum, 2006) who found a stable short-run dynamics for Pakistan using CUSUMQ test.

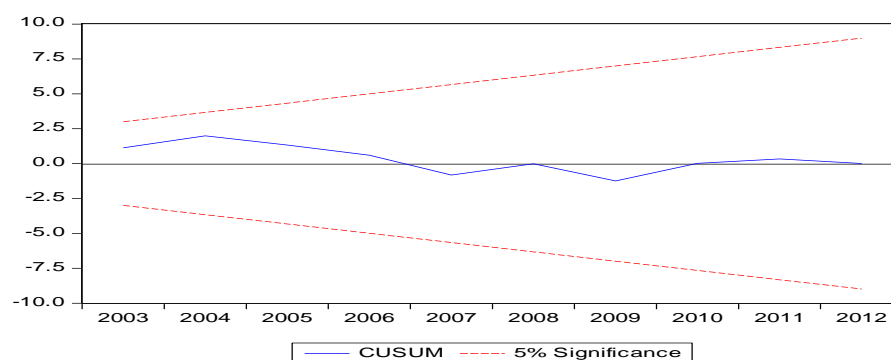


Figure-4.1. Cumulative Sum of Recursive Residuals (CUSUM).

Source: Computer Output from Eviews 8.

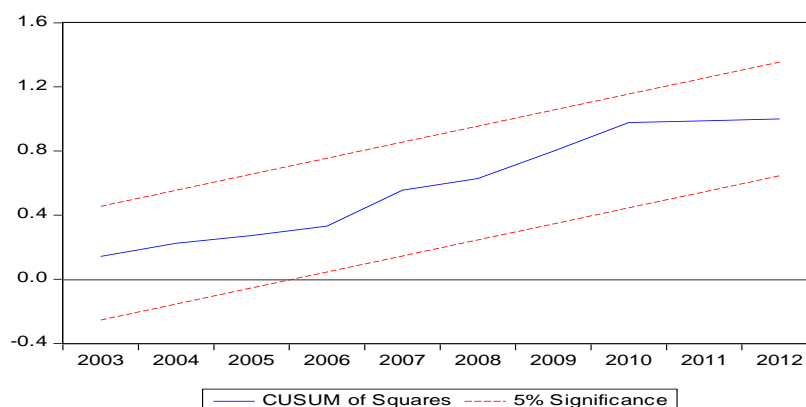


Figure-4.2. Cumulative Sum of Squares of Recursive Residuals (CUSUMSQ).

Source: Computer Output from Eviews 8.

4.6. Granger Causality Test Result

The Granger causality test result is presented in Table 4.6. The decision on the presence or otherwise of causality was reached based on the significant probability values.

Table-4.6. Granger Causality Estimated Result.

Variables	F-statistics	p-ratio
FINDEX ₂ → FINDEX ₁	3.01096	0.0699
FINDEX ₁ → FINDEX ₂	0.45702	0.6390
FINDEX ₃ → FINDEX ₁	3.82196	0.0414
FINDEX ₁ → FINDEX ₃	0.82461	0.4543
GDP → FINDEX ₁	0.81488	0.4626
FINDEX ₁ → GDP	0.14423	0.8670
FINDEX ₃ → FINDEX ₂	0.89047	0.4278
FINDEX ₂ → FINDEX ₃	0.91388	0.4188
GDP → FINDEX ₂	0.25702	0.7769
FINDEX ₂ → GDP	0.76229	0.4850
GDP → FINDEX ₃	0.54913	0.5913
FINDEX ₃ → GDP	0.01065	0.9894

Notes: FINDEX is the financial liberalisation index described in the text. The F-statistics are for a test that the first variable does not Granger-cause the second and the p-value is the corresponding marginal probability.

The result shows the causal relationship between financial liberalization and economic growth; the third objective this study was meant to accomplish. Obvious from the result is the fact that the three different measures of financial liberalization used in this study did not granger cause GDP.

However, there appears to be causality between the measures of financial liberalization. A unidirectional causality from FINDEX₂ to FINDEX₁ at a 10% significant level is evident in the result. Likewise, there is a unidirectional causality from FINDEX₃ to FINDEX₁ at the 5% significant level.

5. CONCLUDING REMARKS

Attempt was made in this study to ascertain whether or not financial liberalisation policies adopted in Nigeria from 1986 to 2014 promoted economic growth in the country. The results from the ADF and PP stationarity tests indicated that the variables were not integrated of the same order, thereby justifying the use of ARDL-Bounds tests approach. Based on the empirical findings of the study, the following concluding remarks were reached: All the included variables significantly impacted economic growth in both the short run and long run, with the exception of lending rate, which was negatively significant in the short run and negatively insignificant in the long run. The impact of financial liberalisation on economic growth however varied according to the particular measure of financial liberalisation adopted. FINDEX₁ (financial deepening) significantly impacted economic growth positively. This finding is consistent with other studies, including; Bhaduri (2005); Agu and Chukwu (2008); Sulaiman *et al.* (2012); Akpansung and Babalola (2012); Adam (2011); Okpara (2010); Akpan (2004); Fredj and Schalck (2010). They found significant positive relationships between financial liberalisation and economic growth. The study deviates from Owusu and Odhiambo (2013) who found negligible effect of financial liberalization policies on economic growth in Ivory Coast in the short run as well as in the long run.

FINDEX₂ (financial depth) and FINDEX₃ (stock market development) exerted significant negative impacts on economic growth. The latter finding tallies with those of Tswamuno *et al.* (2007) who found that increased post-liberalization stock market turnover had a negative effect on economic growth in South Africa; and to those of Levine and Zervos (1998) who found that stock market size did not show robust correlation with economic growth. We infer also that any disequilibrium in the economy was restored within one year and seven months. Inflation (CPI) and economic growth were positively related, implying growth in the economy necessitated increases in level

of prices. The coefficient for debt service ratio, proxied by macroeconomic uncertainty, appeared negatively significant. This reveals that distortion in the business community as a result of unfavourable economic policies or speculations could hinder the growth of the economy.

The residual tests confirmed the normality of the residuals, the absence of serial correlation; as well as the homoscedastic nature of the residuals. Both the CUSUM and CUSUMSQ plots indicated stability in the estimated coefficients over the sampled period. The three different measures of financial liberalization did not Granger-cause economic growth, rather a unidirectional causality ran from FINDEX₂ to FINDEX₁ and from FINDEX₃ to FINDEX₁.

6. POLICY RECOMMENDATIONS

1. In strengthening the benefits of the financial liberalization reform process, government should focus on perfecting the existing policy measures which will not only ensure shrewdness of major operators in the financial market but also strengthen saving behaviour of all economic agents.
2. Stability in macroeconomic variables such as: inflation, total savings and investment should also be ensured by the Central Bank of Nigeria (CBN) and supported by the government. This would stimulate the growth of financial deepening in the system.
3. There is need to monitor and remove bottlenecks in the financial sectors of the economy through improved effectiveness of credit to private sector and efficient credit evaluation to realize its full potential indirect effects on economic growth.
4. Monetary policy on interest rate liberalization should be geared towards stimulating savings for investment growth. This means lending rates would have to fall to a level where lending-savings margin would be low; enough to stimulate significant growth in the volume of savings. Achieving the above goal would guarantee investors access to huge investment funds for business purposes. Thus, a continuous growth of the economy can be assured.
5. Finally, results of empirical findings suggest that the implementation of market determined interest rates and capitalization as against determined or pegged rates will continue to motivate significantly the realignment of financial deepening and the mobilization of savings in the country.

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