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BANKING SECTOR DEVELOPMENT AND ECONOMIC GROWTH IN NIGERIA (1981-2016)

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Abstract
The banking sector of a country provides the catalyst, through financial intermediation, for productive activities to ensure economic growth and development. The global financial crisis which manifested in form of liquidity and credit crunch has affected Nigeria financial system and economic growth. This study empirically examines the relationship between banking sector development and economic growth in Nigeria from 1981to2016. Secondary data used in this study were sourced from the publication of the Central Bank of Nigeria Statistical Bulletin and World Development Indicators from 1981to 2016. The Ex post factor research design was adopted. The key banking sector variables for which the data were sourced included Domestic Credit, Money Supply, Liquid Liability. Real Gross Domestic Product was used to proxy economic growth for the periods of study. Augmented Dickey Fuller (ADF) and Phillips Perron (PP) test of unit root were conducted to affirm the stationery of the series and guard against spurious regression outcomes from the times series data. The Bound co-integration test was also conducted to affirm the existence of co-integration among the variables in the long run while autoregressive distribution Lag model (ARDLM) was adopted to examine the short and long run effects of banking sector development on economic growth. Results showed that, in the long run, Money supply and Liquid liability recorded positive impact on RGDP while Domestic credit influenced RGDP negatively. In short run, the result revealed that Domestic credit and Money supply had positive impact while the impact of liquid liability was not established. The study recommends that government should formulate policies that will encourage banks to lend more to the productive sector (real sector). This will stimulate economic growth in Nigeria.

Keywords: *Banking Sector, Economic Growth*

JEL Classifications: *E8*

1. INTRODUCTION

At the time the Nigerian banks were mostly weak and unproductive, CBN started the banking sector development through bank consolidation which was to specifically, to strengthen the banking system and improve the operational productivity of the Nigerian banks. Based on CBN surveillance report, 62 banks out of 89 were classified as sound or satisfactory and 14 as marginal at the end of March 2004. The number of weak banks had risen from 9 as at end of the year 2003 to 11 in May, 2004. A very high over reliance on public sector funds and CBN credits as well as income from foreign exchange trading

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emerged on the part of the banks. Besides being grossly under capitalised, the banking industry was characterised with several faults which includes; poor corporate governance, poor asset quality, imprecise reporting and non-submission to regulatory requirements, falling ethics and de-marketing of other banks in the industry, gross insider abuses resulting in a very high non-performing insider related credits, oligopolistic structure with 10 of the 89 banks controlling over 50 percent of the industry's assets and liabilities, lack of capacity to support the real sector of the economy, and lack of competition by banks in saving mobilization to boost the level of deposit. The situation was such that weak banks were paying greater interest rates so as to attract more deposits. Banks indebtedness to the CBN was about ₦71.36 billion at the end of May, 2004. The reason behind the bank consolidation exercise was to address the weaknesses in the banking system through recapitalisation of banks with minimum paid up capital of ₦25 billion. This was aimed at ensuring minimal reliance on public sector for funds, adoption of risk focused and rule based regulatory frame work, adoption of zero tolerance in regulatory framework. (Sanusi, 2010).

The consolidation exercise had some positive impacts on the banking sector beyond reasonable doubt. Through the regulatory merger and acquisition, the banking system was transformed from 89 banks to 25 through and latter to 24 through market-induced merger and acquisition. The banks in the system increased from 2,900 in 2005 to almost 5,500 in mid-2009. Apart from deepening of the capital market, the banks were strategically positioned to be actively involved in a wider range of activities, including financing of infrastructure and the oil sector. However, during the consolidation exercise, some development in the economy as well as within the banking system itself put the banking sector at serious risk. Between 2004 and 2008, Nigeria enjoyed exceptional increase in oil price which resulted in enormous in-flow of foreign exchange and robust economic growth.

This, alongside with significant level of foreign direct investment inflows, amounts to huge liquidity in the economy which the real sector of the economy could not absorb. The surplus liquidity found its way into the stock markets. This is shown in the unprecedented rally in the stock prices on the Nigerian Stock Exchange between 2006 and March 2008. The excess liquidity also allowed banks to raise capital. Fresh capital raised between 2006 and the first quarter of 2008 amounted to ₦1603 billion. The increase in capital supported banks' balance sheet growth with banking sector assets as percentage of GDP increasing rapidly to 60 percent from about 30 percent in 2004. With significant capital and greater liquidity, banks were increasingly under pressure to create risk asset amidst limited product innovation and diversification. This, coupled with poor risk management practices, ultimately resulted in a concentration of assets in certain areas, in particular margin lending and oil trading or marketing. At the end of December 2008, banks total exposure to the oil industry stood at over₦754.0 billion, representing over 10.0 percent of the banking sector and over 27.0 percent of the shareholders 'funds.

The global financial and economic crisis set in mid-2008. At this time, the domestic financial system was submerged by numerous codependent factors that resulted in the re-occurrence of an exceedingly insubstantial financial system closely related to pre-consolidation era. These factors included; macroeconomic unsteadiness triggered by huge and abrupt inflow of capital, major setbacks in corporate governance at banks, absence of financier and consumer sophistication, deficient release and transparency about financial position of banks, critical gaps in regulatory framework and procedures, uneven administration and implementation, unstructured governance and management processes at the CBN weaknesses within the CBN, and weaknesses in the business environment. When, that when the global crisis eventually hit Nigeria, it is therefore clear that the banking sector was not well equipped to accommodate the storm irrespective of recapitalisation. The crisis in finance had an adverse effect on both the oil and gas sector, capital market, and banking

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sector. This resulted in a sharp decline in the quality of banks assets which immediately led to worries over banks' liquidity. Indeed, the Nigerian banking sector experienced crisis in which many of the banks became distressed. (Sanusi 2010).

There has been no widely accepted fundamental relationship between Banking sector development and economic growth in Nigeria in spite of the contributions of the numerous existing studies on banking sector development and economic growth. This is probably because most of these studies have used majorly one or two variables once to examine economic growth. The empirical proofs from such studies on the impact of banking sector development on economic growth in Nigeria have so far generated diverse results that are inconclusive and contradictory. This means that there is a significant gap in literature which calls for attention. The gap that must be filled centers on some problems that this study sets out to provide innovative and empirical solution to. One of such needful solutions involves examining the relationship between Banking Sector Development variables and economic growth variables.

On account of the contradictions in the available facts from earlier studies, the question of whether banking sector development has positive or negative impact on economic growth is still worthy of further investigation, and this will be one of the focal points of this study. This study attempts to fill this gap by studying the situation of the Nigerian Banking sector development on economic growth. The main objectives of the study is to examined the relationship between banking sector development and economic growth in Nigeria. The key banking sector indicator considered in this study are domestic credit, money supply, and liquid lability and their individual effect on economic growth in Nigeria were investigated.

2. LITERATURE REVIEW

2.1 Conceptual Framework

2.1.1 The Nigerian Banks

The first bank to operate in Nigeria was the "African Banking Corporation in 1892, whose primary aim was to facilitate the transmission of funds from the colony (Nigeria) back to the home country (United Kingdom). This bank was taken over by the Bank for British West Africa in 1894 (now First Bank of Nigeria Ltd). Thereafter, many expatriate banking organizations were established" (Uzoaga, 1981). In 1912, however, the West African Currency Board was established, to maintain parity between the West African Currency and the British Pound. The Currency Board was not a monetary authority (CBN 2007).

A review of the present structure of the Nigerian banking sector by the Central Bank of Nigeria as of September 2009 showed that there were 104 community and 21 commercial banks in Nigeria and that they accounted for 93 percent of the value of private assets of the financial sector, indicating a large banking sector relative to the financial sector. According to the Central bank of Nigeria's draft Annual Report for the year ended 31 December 2008, the Nigerian banking sector is dominated by four banks, which account for 58 percent of the value of the assets and 65 percent of the total deposits held by the banking sector. Only two of Nigeria's banks have some measure of control by foreign banks with only a 4% stake of total assets.

It is noted by the Central Bank of Nigeria that the significant growth and expansion noted above in the Nigerian banking sector is not without challenges. This is highlighted by the significant expansion from 41 banks before 1986 to 120 by 1994; the stiffness of the

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competition and other associated challenges facing the sector resulted in a fall from 120 banks to 89 banks by 2004 fall to 24 by 2009 and then 21 by 2015 (CBN 2015). While some of these changes were market instigated and due to capitalization, as noted by Soludo (2004), others were outcomes of the federal government's earlier proposals to introduce an indigenization policy in the sector, allowing Nigerian citizens to have total control of the sector.

The financial sector boom, therefore, was, however, accompanied by financial disintermediation. "This tragic situation led to the continued foreclosure and technical insolvency of many banks and finance houses" (Eke 2003,) and "the latest assessment shows that while the overall health of the Nigerian banking system could be described as generally satisfactory, the state of some banks is less cheering" (Soludo 2004,). Access by the Nigerian banking sector to the stock market as a source of long term capital to finance its activities has been and may continue to be a major catalyst for any future growth of the banking sector (NSE 2009).

2.1.2 The Concept of Economic Growth

The concept of economies with intent to improve the welfare of citizens is a desirable goal. This explains why economic literature is replace with theories and studies investigating variables required by economies to achieve sustainable growth. It also explain why governments are interested in such variables. Garba (2014) confirmed that economic growth is one of the macroeconomic goals of government; since most government work hard at growing their economies in order to stem unemployment, increase output, improve industrial capacity utilization. The concept of economic growth has been viewed by expects from many perspective. The Wikipedia defines it as '' a term used to indicate the increase in per capital gross domestic product (GDP)''. Further buttressing this economic growth is said to refer to sustained increase in a country's output of goods and services. The definition by Global oneness is much in line with those above. It states that economic growth refers to an increase in the real output of goods and services which leads to increased income, savings and investment.

A close look at these definitions of economic growth reveals their emphasis on quantitative increases in the productive output (Ekpenyong and Acha 2011). The qualitative dimension which incorporate individuals welfare improvement (in health care, poverty reduction, increased employment etc) is normally referred to as economic development(http;//massofa.wordpress.com/2010/02/13/concept of economic growth). It is further noted on this website that economic growth is concerned with expansion of an economy's ability to produce potential (GDP) over time. Such expansion can only occur when natural resources, human resources or capital increases or when technology improves. Increases alluded to above can be catalyzed by availability of funding, which is where banks come in.

2.1.3 Banks and Economic Growth

Writing on the role of banks in economic growth, Akpansung and Babalola (2012) opined that banks are important to the economy because they influence the level of economic activities in two ways, namely; by expansion and contraction of loans and investment. These activities alter the nation's money supply and by extension affect the size of loans, influence what is produced, how much is produced and where it is produced. Similarly, Ubom (2009) identified banks as agents of economic development. this is because they invest directly in

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the economy (e.g by buying the shares of other companies) and also grant loans to others for investment and purchase of securities.

Banks contribute to the economy by mobilizing savings from the surplus economic unit and making these funds available to the deficit economic unit. By so doing, banks are able to finance investments. Many scholars share in the opinion that savings mobilized by banks are utilized by the deficit economic unit for investment which improves capital accumulation, expand output and invariably leads to economic growth.

To explain the link between financial development and economic growth, Levine (1997) used a functional approach . He attributed the need for financial intermediaries to market frictions in form of information cost and transactions cost. He proceeded to identify five functions of financial institutions through which they aid economic growth, these are;

i. facilitating trading, hedging, diversifying and pooling of risks
ii. Allocating resources
iii. monitoring managers and exerting corporate control
iv mobilizing savings
v facilitating exchange of goods and services

He posited that these functions performed by these institutions affect steady-state growth by influencing the rate of capital formation. He further stated that financial system affects capital accumulation either by altering the savings rate or by reallocating savings among different capital producing technologies.

2.2 Theoretical Review

2.2.1 The Theory of Financial Intermediation

The theory of financial Intermediation advocates that financial intermediaries play a crucial role of intermediation in the growth process by transferring financial resources from the net savers to net borrowers, thus influencing investment and thereby economic growth. The theory suggests that financial intermediaries can overcome a market failure and resolve an information asymmetry problem by transforming the risk characteristics of assets. Theses asymmetries in credit markets arise because borrowers generally know more about their investment projects than lenders do. Information failures lead to specific forms of transaction costs and financial intermediaries appear to overcome these costs, at least partially. The notion of transaction costs encompasses not only exchange or monetary transaction costs (Tobin, 1963) but also searches, monitoring and auditing costs (Benston and Smith, 1976).

The work of Schumpeter (1911), supports the view that well –functioning financial intermediaries can promote the overall economic efficiency. By pooling and allocating funds, financial intermediation promotes entrepreneurship and innovation which are necessary components for economic development. Gurley and Shaw (1960) supported the view that financial intermediaries are an opportunity to enhance borrower's financial capacity in the savings and investment process. Thus, the higher the intermediation level in the financial sector, the higher the savings mobilized and higher would be investments, which in turn will increase the level of economic growth. In the same way , according to Goldsmith (1969), the financial structure of an economy accelerates economic performance to the extent that it facilitates the migration of funds to the best user, i.e, to the place in the economic system where the funds yield the highest social return. The opinion of Greenwood and Jovanovic (1990) is in line with this view; they argue that financial intermediation promotes growth because it allows a higher rate of return to be earned on capital, and growth in turn provides a means to implement costly financial structures.

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2.2.2 The Theory of Financial Liberalization

Financial Liberalization refers to the process to liberalize the financial sector of a country with an aim to create favourable environment to increase the money demand in the economy. This is assumed to take place in two ways;(i) By increasing the financial resources to lead the supply- induced demand for money (ii)By creating suitable environment to make investments in the economy. The theory of financial liberalization pioneered by Mac Kinnon (1973) and Shaw (1973) advocates for the liberalization of the financial sector as an effective way to accelerate growth. The theory suggests that the liberalization of financial markets allows financial deepening which reflects an increasing in use of financial intermediation by savers and investors as well as the monetization of the economy. In other words, by lowering financial market frictions, domestic savings are increased and foreign capital is attracted. The theory is based on the premise that the higher the real rate of interest, the greater the degree of financial deepening, the more saving, financial saving will be allocated and invested more efficiently than if saving is invested directly in the sector in which it takes place, without financial intermediation. The Mckinnon- Shaw theory of financial liberalization suggests a complementarity relationship between the accumulation of money balances (financial assets) and physical capital accumulation in developing countries, leading to economic growth.

2.3 Empirical Framework

Emmanuel, Abiola and Anthony (2015), examined the impact of private sector credit on economic growth in Nigeria using the cointegration test that accounted for structural breaks and edogeneity problems. The method was applied to quarterly data spanning 2000: QI to 2014: Q4, while the fully modified ordinary least squares procedure was employed to estimate the model coefficients. They found a cointegrating relationship between output and its selected determinants, Albeit, with a structural break in 2012 Q1. Among others findings from the error correction model confirmed a positive and statistically significant effect of private sector credit on output, while increased prime lending rate was inhibiting growth. Marlyse (2015), examined effects of financial deepening on economic growth in Kenya. The study reveal that liquid liabilities, credit to the private sector, commercial central bank assets and commercial bank deposit have positive and statistically significant effects on GDP

Akpansung and Babalola (2012) , examined the relationship between baking sector credit and economic growth in Nigeria over the period 1970-2008 using the two stages least square approach. They found evidence that private sector credit impacted positively on economic growth during the sample period while lending rate impeded economic growth. The study of Aliero (2013) examined the relationship between private sector and economic growth in Nigeria using auto regressive distributed lag (ARDL) approach and concluded that a long run equilibrium relationship exist between private sector credit and economic growth.

Aniekan and Mathew (2014), examined the implication of the reforms on sectoral credit allocating and economic growth using both analytical and ordinary least squares estimating techniques. The study show that, despite the drastic reduction in the number of commercial banks during the reforms period credit allocated to the activity sector (Agriculture, mining & quarrying, manufacturing, communication and oil & gas) improved.

Aliyu and Yusuf (2013), carried out a study on impact of credit to private sector (CPC) on the real sector of Nigeria with a view to assess the significant contribution of CPS to real sector growth in Nigeria. The study used aggregate time series data from 1986 to

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2010, the data was analyzed using multiple regressions and based on the coefficient of determination R square, the study reveals a 96.1% variation between the CPS and real sector growth in Nigeria. The study concludes that there is a statistically significant impact of credit to private sector on the real sector of Nigeria.

Oluwafemi, Akinlo and Elumilade (2014), examined the impact of bank credit to output growth on the manufacturing and agricultural subsectors of the economy over the period 1980-2010. Using the error correction modeling techniques, the result show that bank credit has significant impact on manufacturing output growth both in the short run and long run but not in the agricultural subsector. Inflation and exchange rate depreciation have negative effects on manufacturing output growth in both short run and long run. To boost output growth in the real sector, more bank credit should be made available to the real sector. Also inflation should be kept low while the value of the domestic currency should be strengthened.

On the other hand, some studies have failed to confirm a positive relationship between private sector credit and output growth. For instance, Dey and Flaherty (2005), examined the impact of bank credit and stock market liquidity on GDP growth using two stage least squares regression model and found that bank credit is not a consistent determinants of GDP growth. A number of studies have also found similar outcomes based on causality test. Shan and Jiahong (2006) examined the impact of financial development on economic growth in China by using a vector Auto regression (VAR) approach. They found that financial development come as the second force in leading economic growth in china. In addition, they found a two-way causality between financial development and economic growth, similar to the findings by Hondroyiannis (2004) for Greece.

Mushin and Eric (2000), found Unidirectional causality running from growth to financial sector development. The study of Mukhopadhyay and Pradhan (2010), examined the causal relationship between financial development and economic growth of Seven Asian developing countries (Indonesia, Malaysia, the Philippines, china, Thailand, india and Singapore), using multivariate VAR model. The study failed to reach any consensus on the finance growth relationship in the context of developing countries. In Nigeria, there are diverse opinions as to whether finance is the major constraint to economic growth and development. A number of studies have adopted the VAR – based grager causality test approach to investigate the phenomenon. Odedokun (1989), for instance, tested the causality between financial variables and economic development. Among others, he found a weak unidirectional causation running from Real gross domestic product to broad money.

Abubakar and Gani (2013), in their study on impact of banking sector development on economic growth, using Vector Error Correction Modeling (VECM) with data covering the period of 1970 – 2010, found a negative relationship between credit to the private sector and economic growth, due to unfavourable feat of credit going into real sector. The study emphasized on financial deepening towards real sector. Nwanyanwu (2010), investigated the role of bank credit on economic growth of Nigeria. The study found that bank credit did not exhibit positive relationship towards economic growth. The study claimed that this was due to apathy exhibited in lending to the private sector for productive purposes. The study recommended that the regulating body such as Central Bank of Nigerian (CBN) should adopt a direct credit control that will be beneficial to the real sector of the economy, which is the latest reform in the banking sector, where there is mandatory credit allocation to critical sector of the economy.

Ayadi (2013), explore the relationship between financial sector development and economic growth across the Mediterranean, using data covering the period of 1985 – 2009. The study found that credit to the private sector and bank deposits are negatively associated

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with growth, which in the authors opinion, portend deficiencies in credit allocation in the region and suggest weak financial regulation and supervision. Bhusal, (2012), investigates the impact of policy reforms on financial development and economic growth in Nepal, using exogenous break test, and time series data ranging from 1965 to 2009. The study could not establish positive relationship between bank domestic credit and economic growth. The study suggests that the finding might due to some problems which inhibit the banking sector in the country, such as inadequate expansion of commercial banks and their branches in the rural non – monetized sector, non – performing loans that discouraged credit allocation among others. This study intends to expand the frontiers of knowledge by investigating the relationship between banking sector credit and real gross domestic product in Nigeria.

3. METHODOLOGY

Secondary data used in this study were sourced from the publication of the Central Bank of Nigeria Statistical Bulletin and World Development Indicators from 1981to 2016. The Ex post factor research design was adopted. Augmented Dickey Fuller (ADF) and Phillips Perron (PP) test of unit root were conducted to affirm the stationery of the series and guard against spurious regression outcomes from the times series data. The Bound co-integration test was also conducted to affirm the existence of co-integration among the variables in the long run while autoregressive distribution Lag model (ARDLM) was adopted to examine the short and long run effects of banking sector development on economic growth.

This study employs the Autoregressive Distributed Lag (ARDL Bounds) testing approach to co- integration proposed by Pesaran and Shin (1999). The ARDL approach offers some desirable statistical advantages over other co-integration techniques. While other co-integration techniques require all the variables to be integrated of the same order, ARDL test procedure provides valid results whether the variables are I(0) or I(1) or mutually co-integrated and provides very efficient and consistent test results in small and large sizes.

3.1 Model Specification

The study employs a simplified econometric model to analyse the precise implications of Banking Sector development on economic growth in Nigeria. The model is formulated based on reviewed empirical and theoretical studies. It is worthwhile to note that the Solow version of the neoclassical theory indicates that the functional relationship between output and factor inputs, which can be expressed in a typical Cobb-Douglas production function as:

$$Y = f(AK, L) \qquad (3.1)$$

Where Y is production output; A is technological input; K is capital; and L is labour. The capital and labour constitute the factors inputs.

3.2 Empirical Modeling of Banking Sector Development and Economic Growth

From Equation (3.2), the empirical model indicating the relationship between banking sector development and output growth in Equation (3.2). The banking sector development indicators are domestic credit to private sector, money supply and liquidity liability, all as ratios of GDP.

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$$lnY_t = \rho_0 + \rho_1 lnK_t + \rho_2 lnLAB_t + \rho_3 lnDCPS_t + \rho_4 lnMS_t + \rho_5 lnLL + \rho_6 lnFDI_t + \rho_7 lnTOPEN_t + \mu_t$$
(3.2)

Where: *Y* is aggregate output measured by real GDP growth; *K* is capital measured by gross fixed capital formation; *LAB* is labour force; DCPS is domestic credit to private sector; *MS* is money supply; *LL* is liquidity liability; *FDI* is foreign direct investment; *TOPEN* is trade openness; $\rho_0, \rho_{1-7}$are parameters; *t* is time; μ is error term.

3.3 Estimation Technique

3.3.1 Augmented Dickey Fuller Test

The most popular strategy for testing the stationarity property of a single time series involves using the Dickey Fuller or Augmented Dickey Fuller test. The standard Dickey Fuller test is carried out by estimating the following;

$$y_t = \rho y_{t-1} + x_t'\delta + \varepsilon_t \quad (1)$$

After subtracting y_{t-1} from both sides of the equation:

$$\Delta y_t = \alpha y_{t-1} + x_t'\delta + \varepsilon_t \quad (2)$$

Where $\alpha = \rho - 1$

The null and alternative hypotheses may be written as: H_0: $\alpha = 0$ and $H_1 : \alpha < 0$

Based on these hypotheses, if the calculated t-statistic is below the Dickey and Fuller critical value, we reject the hypothesis that the time series has a unit root and conclude that the series is stationary. On the other hand, if the calculated t-statistic is above the Dickey and Fuller critical value, we fail to reject the hypothesis that the series has a unit root and conclude that the series is non-stationary. The simple Dickey-Fuller unit root test described above is valid only if the series is an AR (1) process. If the series is correlated at higher order lags, the assumption of white noise disturbances ε_t is violated. The Augmented Dickey-Fuller (ADF) test constructs a parametric correction for higher-order correlation by assuming that the *y* series follows an AR (*P*) process and adding *P* lagged difference terms of the dependent variable *y* to the right-hand side of the test regression:

$$\Delta y_t = \alpha y_{t-1} + x_t'\delta + \beta_1 \Delta y_{t-1} + \beta_2 \Delta y_{t-2} + \ldots \beta_p \Delta y_{t-p} v_t \quad (3)$$

The usual practice is to include a number of lags sufficient to remove serial correlation in the residuals and for this; Akaike Information Criterion is employed. Therefore, for the purpose of this study, the test to be carried out is the Augmented Dickey-Fuller unit test.

3.3.2 Phillips-Perron (PP) Test

Phillips and Perron propose a non-parametric alternative method of controlling for serial correlation when testing for a unit root. The P-P method estimates the non-augmented DF test equation (3), and modifies the t-ratio of the α coefficient so that serial correlation

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does not affect the asymptotic distribution of the test statistic. The PP test is based on the statistic:

$$t_\alpha = t_\alpha\left(\frac{\gamma_0}{f_0}\right)^{\frac{1}{2}} - \frac{T(f_0-\gamma_0)(se(\hat{\alpha}))}{2f_0^{\frac{1}{2}}s} \quad (4)$$

Where $\hat{\alpha}$ is the estimate, and t_α the t-ratio of α, $se(\hat{\alpha})$ is the coefficient standard error, and *s* is the standard error of the test regression. In addition, γ_0 is a consistent estimate of the error variance in equation (3) (calculated as $(T - K)s^2$ where *k* is the number of regressors). The remaining term, f_0, is an estimator of the residual spectrum at frequency zero.

3.3.3 Autoregressive Distributed Lag (ADRL) Bounds Test Approach

The idea of cointegration is that the linear combinations of two non-stationary series can be stationary. This implies the existence of a long run relationship between the variables. Thus, they can be modelled. In order to empirically analyze the short run dynamic interactions and the long run relationships among the variables of interest, the auto-regressive distributed lag (ARDL) bounds co-integration technique was used.

The co-integration techniques approach was developed by Pesaran and Shin (1999) . Comparatively, the technique has three advantages over other previous and traditional co-integration methods. Firstly, ARDL test is relatively more efficient in the case of small and finite sample data sizes. Secondly, Pesaran et al. (1999) advocated the use of the ARDL model for the estimation of level relationships because the model suggests that once the order of the ARDL has been recognised, the relationship can be estimated by OLS. Lastly and most importantly, the bounds test allows a mixture of I(1) and I(0) variables as regressors, that is, it does not need that all the variables under study must be integrated of the same order and it can be applied when the under-lying variables are integrated of order one, order zero or fractionally integrated. Summarily, by applying the ARDL technique according to (Harris and Sollis, 2003), unbiased estimates of the long-run model is obtained.

According to Pesaran and Shin (1999), the ARDL$(p, q_1, q_2, \ldots q_k)$can be written as:

$$\alpha(L,p)y_t = \alpha_0 + \sum_{i=1}^{k}\beta_1(L,q_i)x_{i,t} + \varepsilon_t \quad (5)$$

Where$\alpha_0$is a constant,$y_t$denotes the dependent variable, *L* is a lag operator,$x_{i,t}$is the vector of regressors (where $i = 1, 2, \ldots, k$) and$\varepsilon_t$is the disturbance term.

Nonetheless, to apply the bounds test, it is important to ensure that the variables under consideration are not integrated at an order higher than one. In the presence of I(2) variables, the critical values provided by Pesaran et al.(1999) are no longer valid. The following ARDL representation of equation (8) will be estimated in order to test the existence of long run relationship between economic growth and financial development.

The structural lags are established by using minimum Akaike's information criteria (AIC). From the estimation of UECMs, the long-run elasticities are the coefficients of one lagged explanatory variable (multiplied by a negative sign) divided by the coefficient of one lagged dependent variable (Bardsen, 1989).

After estimating the ARDL models, the Wald test (F-statistic) was computed to differentiate the long-run relationship between the concerned variables. The Wald test can be carried out by imposing restrictions on the estimated long-run coefficients of the variables. The null and alternative hypotheses are as follows:

$H_0 = \beta_1 = \beta_2 = \beta_3 = 0$ (no long-run relationship)

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Against the alternative hypothesis

$H_0 \neq \beta_1 \neq \beta_2 \neq \beta_3 \neq 0$ (a long-run relationship exists)

The computed F-statistic value will be evaluated with the critical values. The lower bound critical values assumed that the explanatory variables x_t are integrated of order zero, or I(0), while the upper bound critical values assumed that x_t are integrated of order one, or I(1). Therefore, if the computed F-statistic is smaller than the lower bound value, then the null hypothesis is not rejected and we conclude that there is no long-run relationship between the dependent variables and their determinants. Conversely, if the computed F-statistic is greater than the upper bound value, then variables share a long-run level relationship. On the other hand, if the computed F-statistic falls between the lower and upper bound values, then the results are inconclusive.

4. FINDINGS AND DISCUSSIONS

4.1 HO_1; Relationship between Banking Sector Development and Economic Growth in Nigeria

The sub-section first established the unit root test of the variables using two conventional approaches that is, Augmented Dickey Fuller (ADF) and Phillips Perron (PP) in order to find out the appropriate method to evaluate the nexus between banking sector development and output growth. Table 1 presents the results of the unit root for the indicators. The tau-statistic results for intercept and trend model were used to find the statistically significant of the variables at 1%, 5% and 10% critical point at levels and first difference. The lag length for ascertaining this stationarity level of our variables as well as unit-root test is automatic and optimally chosen by the Schwarz-Bayesian Information Criterion (SIC) while few were fixed. The results are presented in Appendix.

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Table 1: **Conventional Unit Root Tests**

Variables	Level		First Difference		*I*(d)
	ADF	PP	ADF	PP	
Y	-2.392(1)[-3.549]	-2.529(2)[-3.5443]	-3.616(0)[-3.549]	-3.907(3)[-3.549]**	*I*(1)
K	-3.692(0)[-3.544]**	-3.669(1)[-3.544]**	-	-	*I*(0)
LAB	-3.443(0)[-3.544]*	-3.749(0)[-3.549]**	-2.976(3)[-3.544]	-3.937(3)[-3.549]**	*I*(1)
DCPS	-2.117(0)[-3.544]	-2.334(1)[-3.544]	-4.187(0)[-3.549]**	-4.065(5)[-3.549]***	*I*(1)
MS	-2.028(1)[-3.549]	-1.971(3)[-3.544]	-3.558(0)[-3.549]**	-3.557(0)[-3.549]**	*I*(1)
LL	-1.770(1)[-3.549]	-1.798(3)[-3.544]	-3.496(0)[-3.549]**	-3.482(1)[-3.207]*	*I*(1)
FDI	-2.039(0)[-3.544]	-1.717(1)[-3.544]	-9.377(0)[-3.549]***	-9.785(4)[-3.549]***	*I*(1)
TOPEN	-0.938(1)[-3.544]	-1.788(2)[-3.544]	-5.478(6)[-3.581]***	-8.812(3)[-3.549]***	*I*(1)

Note: **** significant at 1%; ** significant at 5%; * significant at 10%. Calculated at trend and intercept and lag lengths selected automatically using the Schwarz Info Criterion (SIC).*

Source: **Author's Computation (2019)**.

The two unit root tests under the conventional methods follow the same decision on stationary level of variables of interest at varying significant levels except for capital investment (K) which was stationary at levels at 5%. The unit root test results of other indicators, that is output growth measured by real GDP growth (Y), labour force (LAB), foreign direct investment (FDI), trade openness proxy by total trade as a ratio of GDP (TOPEN), domestic credit to private sector (DCPS), money supply (MS), and liquidity liability (LL) were found not to reject the null hypothesis "not stationary at level" at 5% McKinnon significance level. They were further tested at first differences which were found significant 5% significance level. Thus, it implies that at first difference, the time series of the variables were stationary and integrated of order one and therefore suggests that after differencing at first levels the series, they converge to their long-run equilibrium or true mean. As a result of the findings in regards to the unit root tests, the ARDL estimation approach is found appropriate since this is most suitable for variables at different order of integration.

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Table 4.2: Long-Run Relationship Using ARDL Bound Test (2, 2, 3, 2, 2, 0, 3, 3)

Test Statistic	**Value**	**K**
F-statistics (*Y* | *K LAB DCPS MS LL FDI TOPEN*)	8.2243	7
Critical Value Bounds		
Significance (*Y* | *K LAB DCPS MS LL FDI TOPEN*)	**I0 Bound**	**I1 Bound**
10%	1.92	2.89
5%	2.17	3.21
2.5%	2.43	3.51
1%	2.73	3.9

Note: Extracted from Appendix.
Source: Author (2019).

Table 2 presents the F-statistics estimate for testing the existence of long-run relationship between banking sector development and output growth. The estimated F-statistics of the normalized equations (F_{arb} = 8.2243) was greater than the lower and upper critical bound at 1% significance level. It implies that the null hypothesis of no long-run relationship is rejected at 5% significance level. The implication of the above estimation is that there is existence of long-run relationship between banking sector development variables and economic growth measured by real GDP growth in Nigeria. The model has equilibrium condition that keeps the variables together in the long-run. The short-run and long-run estimates are reported in Table 4.10 for the relationship between banking sector development variables and economic growth measured by real GDP growth since the long relationship among the variables has been established.

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Table 3: Results of Estimated ARDL Model of Bank Sector and Output Growth

Dependent Variable: Real GDP (Y)				
Selected Model: ARDL(2, 2, 3, 2, 2, 0, 3, 3)				
Sample: 1981 2016				
Included observations: 33				
Short-Run Estimates				
Variable	**Coefficients**	**Std. Error**	**t-Statistic**	**Prob.**
Δ(Y(-1))	0.311055	0.056600	5.495664	0.0000
Δ(K)	0.109226	0.011968	9.126346	0.0000
Δ(K(-1))	-0.067004	0.009444	-7.094845	0.0000
Δ(LAB)	1.564802	0.140028	11.17496	0.0000
Δ(LAB(-1))	0.377760	0.084357	4.478100	0.0000
Δ(LAB(-2))	0.296512	0.076663	3.867717	0.0003
Δ(DCPS)	-0.046805	0.018297	-2.558089	0.0015
Δ(DCPS(-1))	0.143246	0.022830	6.274557	0.0000
Δ(MS)	-0.165553	0.029132	-5.682774	0.0000
Δ(MS(-1))	0.057365	0.027817	2.062229	0.0381
Δ(FDI)	-0.026485	0.004529	-5.848213	0.0000
Δ(FDI(-1))	-0.030731	0.005652	-5.437186	0.0000
Δ(FDI(-2))	-0.008977	0.004203	-2.135870	0.0343
Δ(TOPEN)	-0.000637	0.000204	-3.118635	0.0018
Δ(TOPEN(-1))	-0.001499	0.000240	-6.254161	0.0000
Δ(TOPEN(-2))	-0.000556	0.000187	-2.964162	0.0030
ECT(-1)	-0.363359	0.029864	-12.16705	0.0000
Long-run Estimates				
K	0.380458	0.137298	2.771048	0.0036
LAB	0.131693	0.285558	0.461177	0.6456
DCPS	-0.794085	0.393874	-2.016089	0.0451
MS	0.287147	0.272072	1.055408	0.2892
LL	0.429175	0.238239	1.801446	0.0711
FDI	-0.011953	0.057239	-0.208836	0.8236
TOPEN	0.000882	0.003380	0.260992	0.7948
Constant	5.866044	5.036499	1.164707	0.2440
R-squared	0.8881	**F-stat**	36.0025 (0.000)	
Adj. R-squared	0.8162	**D-Watson**	2.0055	

Source: Author (2019).

The ARDL approach choose the lag length on all variables automatically as the model was set at three to ensure sufficient degree of the freedom based on automatic selection of Akaike Information Criterion. The coefficient of the ECM is found to be negative and statistically significant at the conventional level. The ECM value (-0.3634) implied that the model corrects its short-run disequilibrium by 36.34% speed of adjustment in order to return to the long run equilibrium. In Table 3, the short-run parameters of lag one of domestic credit

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to private sector and money supply have positive and significant relationship with real GDP while the current value of their coefficients in short-run was negative. This implies that the first lag of domestic credit to private sector and money supply contribute to the overall output growth. The short-run of the first lag of real GDP has positive and significant association with its current values. This further indicates that the real GDP growth is sustainable. The short-run coefficients of capital and labour force were positive, indicating that they influenced growth positively. However, the parameters of foreign direct investment and trade openness are negative signifying indirect impact on real output growth.

The long-run estimates from Table 4.3 indicate that money supply, liquidity liability, capital, labour force and trade openness positively influence output growth in Nigeria. The result shows that the indicators were in tandem with the theoretical expectations. In magnitude terms, 10% increase in money supply, liquidity liability, capital, labour force and trade openness influence real output growth by 2.87%, 4.29%, 3.81%, 1.32% and 0.001% correspondingly. However, the table reported that domestic credit to private sector by bank (DCPS) and foreign direct investment (FDI) had indirect effects on real output growth, which all do not conform to a'priori expectations. A 10% increase in domestic credit to private sector by bank (DCPS) and foreign direct investment (FDI) reduced real output growth by 7.94% and 0.12% respectively. In terms of partial significance, capital, domestic credit to private sector by bank and liquidity liability were significant at 1%, 5% and 10% respectively, whereas others were found to be insignificant during the reviewed periods.

The coefficient of determination (Adjusted-R^2) is high (81.62%) indicating that about 81.62% of the total variations in real output growth was explained by the variables in the model. It simply indicated that the variation of changes in real output growth was explained by 81.62% variations in banking sector development indicators, capital, labour, FDI and trade liberalization. The overall test using the F-statistic (36.003) is statistically significant at 5% level of significance showing that model is well specified and statistically significant. The Durbin Watson statistic (2.0055) shows that there is absence of serial autocorrelation in the model.

Table 4: Diagnostic Tests

Model (*Y* | *K LAB DCPS MS LL FDI TOPEN*)	
Serial Correlation: 1.6516 [0.1629]	**Normality Test:** 0.5946 [0.7428]
Functional Form: 0.6633 [0.5284]	**Heteroskedasticity Test:** 0.3597 [0.9750]

Source: Author (2019).

The estimated ARDL model is tested for heteroskedasticity, serial correlation, functional form misspecification, parameter stability and normality. The results from these tests are shown in the Table 4. The estimated ARDL model revealed that the models passed the serial correlation test indicating that the error terms are not correlated up to order 4. At the conventional rate, the null hypothesis of normality and heteroskedasticity tests were not rejected. It implies that the error terms are normally distributed and have same variance. Similarly, the functional form test using the Ramsey RESET tests were also satisfactory indicating that the ARDL model is not mis-specified. The cumulative sum and cumulative sum of square tests presented in Figure 1 showed that the residual and its variance are stable during the sample period respectively.

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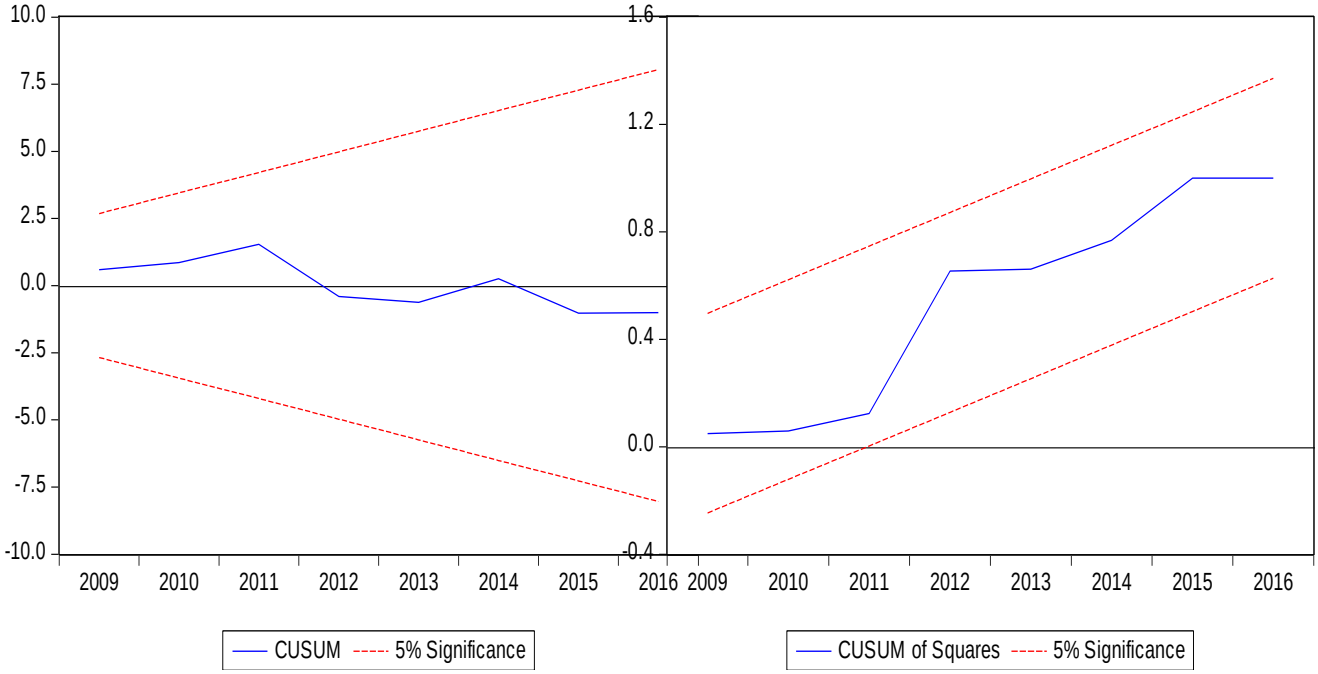

Figure 1: CUSUM and CUSUM of Squares Tests

Discussion of findings

The study discovered empirically on average that banking sector development contributed significantly to the overall output growth in Nigeria. The money supply measure of bank development has significant impact on growth both in short-run and long-run. The short-run of liquidity liability was not reported because it has a long-run implication on growth was found to be positive and significant. Unlike the earlier two indicators of banking sector indicators, domestic credit to private sector by bank only has short-run impact on growth while it failed to sustain growth in the long-run. This indicates the behavioural nature of the Nigerian banks who are more interested in providing credit facilities within short period of time and their unwillingness traits to finance long-term projects. The result is similar to the findings of Dey and Flaherty (2005), Nwanyanwu (210), Abubakar and Gani (2013), Akpansung and Babalola (2012), Aliyu and Yusuf (2013) and Emmanuel, Abiola and Anthony (2015) for the whole economy, likewise, the one reported by Oluwafemi, Akinlo and Elumilade (2014) for Nigerian agriculture sector. In the study of Nwanyanwu (2010), he claimed that it is as a result of apathy exhibited in lending to the private sector for productive purposes. With other banking development indicators and control variable, the result of the long-run relationship with output growth were in tandem with past studies like Dey and Flaherty (2005), Nwanyanwu (2010), Abubakar and Gani (2013), Akpansung and Babalola (2012), Aliero (2013), Aliyu and Yusuf (2013), Oluwafemi, Akinlo and Elumilade (2014) and Emmanuel, Abiola and Anthony (2015). The result of Aniekan and Mathew (2014) stressed the benefit the financial sector most especially the banking industry derived from the consolidation policy as they found that in spite of the drastic reduction in the number of commercial banks during the period, credit allocated to the activity sector (agriculture, mining & quarrying, manufacturing, communication and oil & gas) improved.

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5. CONCLUSION AND RECOMMENDATIONS

Credits and economic growth policy implication of the banking sector relate to the necessity of re-evaluating the minimum capital requirements of N25 billion so as to have banks that will concentrate on specific areas such as real sector of the economy instead of having few banks operating businesses that invest more of their funds in trading and less productive sectors of the economy as mostly practice by banks hiding under provision of the existing universal banking license. The appraisal of the existing minimum capital requirement downward to a more practical level which depends on the type of the banking business a specific bank will want to specialized on and its associated risks. This will enhance bank lending to the most productive sectors of the economy while curtailing their tentative activities in other sectors in the name of universal banking. The total credits received by the economic growth from the bank is likely to be increased. The following recommendations are made base on the finding of study;

The recent establishment of Asset Management Corporation of Nigeria (AMCON) has the function of efficiently resolving the toxic assets (non-performing loans) of banks in order to free the banks statement of financial position which will in turn enable them resume better lending is a good step toward enhancing the capability of banks to lend more to the economy. However, its activities should be monitored by the supervisory bodies that are relevant (e.g. Federal Ministry of Finance and the CBN) to warrant efficient delivery of its mandate. An effective operation of this corporation will resolve the current banking problems of low appetite to lending more importantly to the real sector. Government should urgently address the infrastructural challenges of the country especially concerning energy availability and power supply. Banks should be encouraged to lend more to the productive sector (real sector) if their impact on economic growth is to be felt. The decadence in the education sector should be paid immediate attention to improve the quality of human resource in the economy (Garba 2014).

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