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FINANCIAL
DEVELOPMENT
AND
ECONOMIC
GROWTH IN
NIGERIA

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Abstract

This paper examines the impacts of financial development on Nigeria's economic growth between 1981 and 2018. There are broadly two views on the impacts of financial development on economic growth in the literature. The views are supply leading and demand following hypotheses.

However, the study adopts supply leading view and the ARDL bound testing approach is employed to test the hypothesis. The key variables are per capita GDP and financial development measured by the ratio of broad money to GDP (DEPTH), ratio of private credit to GDP (PRIVY) and the ratio of commercial bank asset to the sum of commercial bank asset and the Central Bank asset (BANK). Investment is used as the control variable and the effects of the global economic meltdown on the Nigeria's economy are captured by a dummy variable. The results of the bound test cointegration show that there exists a long-run relationship among the variables and the long-run model shows that BANK and PRIVY have positive effects on Nigeria's economic growth while DEPTH has a negative effect on economic growth. This indicates that the effect of financial development on economic growth in Nigeria is sensitive to measurement of financial development. As expected, investment has a positive effect on economic growth while the meltdown as measured by the dummy has a significant negative effect on the economic growth.

It is therefore recommended that the government should look inward and diversify the economy in order to mitigate the effect of external shocks on Nigeria's economy.

1.   Introduction

Ever since the work of Schumpeter (1911), a number of studies have been done on the role of financial development on economic growth. In the literature, some studies support the findings of Schumpeter (1911) that financial development has a positive effect on economic growth (Goldsmith, 1969; McKinnon, 1973; Shaw, 1973 and King and Levine, 1993). However, some Authors believe that financial development takes place as a result of economic growth. Irrespective of the views, it has been emphasized that finance plays an important role in the economic development of a country. This can be found in the study by Levine (2004) where he highlights that the financial system provides five main functions. First, developed financial systems provide information about possible investment and allocate capital; second, monitor investment and exert corporate governance; third, facilitate trading, management and diversification of risk; fourth, mobilize and pool savings; and fifth, ease the exchange of good and services (Levine, 2004). It is in the process of performing this functions that the financial systems influence savings and investment decision and, hence growth.

It is as a result of these important functions of financial systems in promoting growth that has motivated the Nigeria's government to embark on various financial reforms. Before the financial reforms was initiated in Nigeria in 1987 as part of Structural Adjustment Programme (SAP), Nigeria's financial sector was faced with interventionist policies. There were statutory interest rate ceiling, directed credits, accommodation of government borrowing, exchange rate controls and informal modes of intermediation (Ifeoma, 2011). However, as part of the steps to kick-start the financial reforms, lending, and deposit rates were liberalized, entries barriers into the banking sector were removed and there was partial removal of credit ceiling on banks. Furthermore, since return to democracy in 1999, there has been enormous financial reform among which

are pension fund, 2004, bank consolidation policy, 2005, insurance and capital market reform, 2007 (Ogwumike and Salisu, 2012).

In spite of the financial reforms, the financial institutions in Nigeria have not performed up to expectation in terms of mobilizing savings for financing long-term investment in the real sector (Ogwumike and Salisu, 2012). Therefore, this study seeks to re-examine the impact of financial development on economic growth in Nigeria by capturing the effect of economic meltdown on the Nigeria's economy using bound test cointegration approach developed by Pesaran et al. (2001). The remainder of the paper is organized as follows: the next section discusses literature review, which includes stylized facts on financial development in Nigeria. The next is the discussion of the methodology and data while results and interpretation are presented just before the conclusion.

2. Literature Review

2.1 Stylized Facts

Considering the role financial development plays in any economy as pointed out in Levine (2004), it will be of practical importance to look at the structure of financial system in an emerging economy like Nigeria. The Nigerian financial system is one of the largest and most diversified in sub-Saharan Africa (World Bank, 2000). The financial system can be divided into two sub-sectors – the informal and the formal sectors. The informal sector has no formalized institutional framework and no formal structure of rates. This includes the local money lenders, thrift collectors, savings and loan associations (Maduka and Onwuka, 2013). The sector is poorly developed and not integrated into the formal financial system and therefore, its exact size and effects are not known and subject to speculation.

The formal sector, on the other hand, comprises bank and non-bank financial institutions. Bank financial institutions are the deposit-taking institutions. As financial intermediaries, they channel funds from surplus economic units to

deficit units to facilitate trade and capital formation. They include commercial banks, development banks and co-operative banks, etc. The non-bank financial institutions include the money markets, capital markets, insurance companies, pension funds, etc. These institutions are not deposit-taking institutions, but some of them perform intermediation functions of channeling funds from surplus to deficit units for economic activities (Maduka and Onwuka, 2013).

The regulatory and supervisory institutions include the Central Bank of Nigeria, the Ministry of Finance, the Nigeria Deposit Insurance Corporation (NDIC), the Securities and Exchange Commission (SEC), National Insurance Commission (NAICOM) and the National Board for Community Banks (NBCB). There is also a Financial Service Regulation Coordinating Committee (FSRCC), charged with coordinating the activities of these regulatory institutions (World Bank, 2000).

The financial market comprises the money and the capital markets. The money market consists of market for inter-bank funds and market for instruments such as treasury bills, treasury certificates, certificate of deposit, bank acceptances, commercial papers and short-dated eligible development stocks. The Nigerian capital market is one of the oldest in sub-Saharan Africa and the participating institutions in the market include the Securities and Exchange Commission as the regulatory body, the Nigeria Stock Exchange (NSE), Issuing Houses, stock brokers, unit trust and company registrars (World Bank, 2000). The Nigerian financial system is strongly bank-based and the stock market was not well developed until recently (Gries et. al., 2009). Figure 1 displays financial development indicators and real GDP in Nigeria.

Figure 1: Financial Development Indicators and GDP in Nigeria (1981-2018)
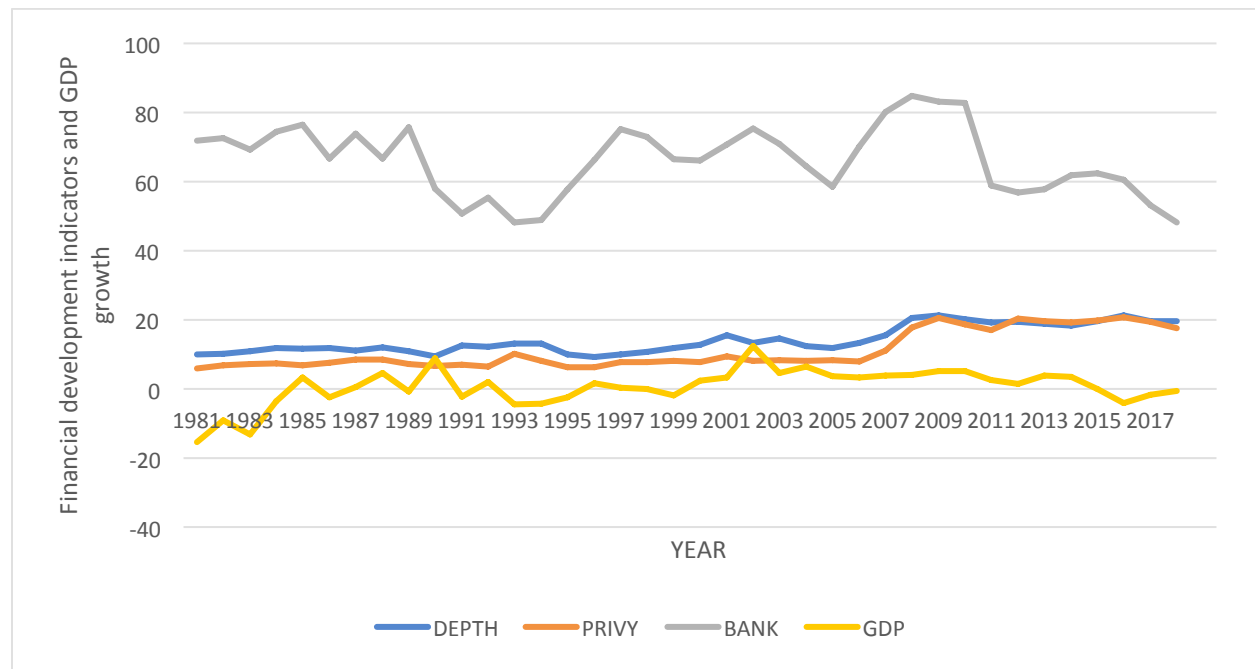
Source: Author's computation from World Bank (2019) and CBN (2019).

2.2. Review of Theory

Despite the fact that a number of studies have been done on the relationship between financial development and economic growth, the results have been mixed. The links between finance and growth can be traced back to early last century when Schumpeter pioneered the study (Kar, Nazlioglu and Agur, 2011). And ever since, there has been growing body of literature on the study. With regards to theoretical literature, there are broadly two schools of thought. The first is rooted in the work of Schumpeter (1911) who highlights the role of financial development on economic growth. Schumpeter (1911) argues that through innovation, determination and funding of productive investment, financial institutions promote future economic growth and development. The second view is attributed to Robinson (1952) who considers the role of finance in economic growth as relatively unimportant. Robinson (1952) opines that the demand for financial services increases as output grows and this has a positive feedback effect on financial development and not the other way round.

These two views are formalized by Patrick (1966). Patrick (1966) identifies the situation where financial development promotes economic growth as supply leading. This means that the creation of financial institutions, supply of their financial assets, liabilities and other financial services ahead of demand for them, induce economic growth. This stimulates growth by transferring resources from traditional (non-growth) sector to modern (growth-promoting) sector. In addition, economic growth is further induced by promoting and stimulating entrepreneurial response in this modern sector. However, the second view which originates from the work of Robinson (1952) is tagged demand following. This means that the demand for financial assets, liabilities, and related services by savers and investors in the real economy stimulates provision of these services by financial institutions (Kar et al., 2011). Therefore, the increase in economic growth promotes the expansion of financial development.

However, both Monetary Keynesian growth models and Mackinnon and Shaw model support the supply leading hypothesis even though the two differ in the role of government and interest rates in the financial market. The Keynes argued that interest rate has a natural tendency to be above full employment equilibrium level and hence, there is the need for government to intervene. This is asserted in the work of Tobin (1965) that low and regulated interest rate has a growth-enhancing implication on the economy. This is because households have two types of assets- money and productive capital. If the return on productive capital increases relative to money, households will hold less money and more of productive capital. This will, therefore, increase capital-labour ratio which improves labour productivity. Higher labour productivity yields increased economic growth. Hence, a fall in interest rate which is the return on money increases the pace of economic growth by making holding money unattractive (Ang, 2008).

Conversely, Mackinnon and Shaw's view is on financial repression, which emanates from controlled interest rate and high reserve requirement. They argue that the policy is harmful to long-term growth by limiting availability of funds to productive investment. Mackinnon (1973) and Shaw (1973) contend that financial liberalization that ensure deepening of financial sector savings (deposit liabilities) through a positive interest rate will promote financial allocation of credit from unproductive use to productive sectors of the economy. This is termed complementarity hypothesis between real money balances and investment. This hypothesis illustrates that an exogenous liberalization reforms will lead to positive interest rate which will, in turn, bring about increased saving liabilities and efficient credit allocation that will transform to real investment and increased output and economic growth (Ogwumike and Salisu, 2012). In addition, the support for supply leading hypothesis can also be found in the endogenous growth model. The model conclude that financial intermediation affects steady-state growth positively and that government intervention in the financial system has a negative effect on growth rate (Levine et al., 2000 and Ang, 2008).

2.3. Review of Empirical Evidence

A large number of empirical studies have been carried out to test the relationship between financial development and economic growth, but no consensus has been reached. Some studies support supply leading hypothesis while some others are in favour of demand following hypothesis. There are even others that show bi-directional relationship.

Starting with De Gregorio and Guidotti (1995) who examine the relationship between long-run growth and financial development in 100 countries from 1960 to 1985 using Ordinary Least Square (OLS). They proxy financial development with the ratio of bank credit to private credit and bank credit to GDP. Their

conclusion is that financial development leads to improved growth performance, even though this effect varies across countries and over time. Similarly, Shan and Jianhong (2006) investigate the impact of financial development on Chinese economic growth using vector autoregression approach. While measuring financial development by the ratio of broad money (M2) to GDP, they find out that financial development in China is a second force (after the contribution of labour) affecting economic growth and the swift reform and change in Chinese financial system have brought about significant credit resource to the economy.

Moreover, Akinlo and Egbetunde (2010) examine financial development and growth in ten countries of Sub-Saharan Africa for the period between 1980 and 2005 while measuring financial development by the ratio of M2 to GDP. Using multivariate cointegration analysis and error correction modelling, they find out that financial development Granger causes economic growth in Central African Republic of Congo, Gabon and Nigeria while economic growth causes financial development in Zambia. However, a bi-directional relationship between financial development and economic growth exists in Kenya, Chad, South Africa, Siera-Leone and Swaziland. In addition, a study by Estrada et al. (2010) in 116 economies with four non-overlapping 5 years period from 1987 to 2008 using liquid liabilities relative to GDP, private credit by deposit money bank relative to GDP and stock market capitalization relative to GDP as measures of financial development find a significant and positive effect of financial development in real per capital GDP.

A study on financial development and economic growth in Nigeria by Ibrahim (2012) between 1970 and 2010 adopting error correction and Engle-Granger cointegration technique, finds out that financial intermediation has a significant impact on economic growth. In a like manner, Onwumere et al. (2013) examine

the impact of financial deepening on economic growth in Nigeria and measure financial development by money velocity, money stock diversification, market capitalization and market liquidity. They use multiple regression model and find out that financial development has a positive non-significant impact on GDP. Also, Ogwumike and Salisu (2012) examine short-run, long-run and causal relationship between financial development and economic growth in Nigeria from 1975 to 2008 using credit to private sector, stock market and financial intermediation as a measure of financial development. They adopt bound test approach and show that a positive long-run relationship exists between financial development and economic growth in Nigeria.

Conversely, Demetriades and Hussein (1996) conduct a causality test between financial development and real GDP in 16 countries using Granger causality test. The study shows that economic growth systematically causes financial development and on balance, most of the evidence seem to favour the view that the relationship between financial development and economic growth is bi-directional. Further, Osuji and Chigbu (2012) examine the impact of financial development on economic growth in Nigeria using   Granger Causality test, Co-integration and Error Correction Method (ECM). The Granger tests indicate a bi-directional causality between Money Supply (MS) and Economic Growth (GDP). Also, Torruam et al. (2013) examine the impact of financial deepening on economic growth in Nigeria from 1990 to 2011 and measure financial deepening by stock of money supply, domestic real credit and foreign real credit. The Johansen approach of cointegration used in the study shows that there is uni-directional causality running for economic growth to financial deepening.

Baliamoune-Lutz (2008) investigates the linkages between financial liberalization and economic growth in Morrocco from 1972 to1999 employing vector error

correction model. Financial development is measured by liquid liabilities and the result supports demand following view of financial reform. Moreover, Ndlovu (2013) examines the causality between growth and financial development while measuring financial development by liquid liabilities, stock market capitalization and domestic credit relative to private sector. Multivariate Granger causality test is employed and the result is consistent with demand following hypothesis.

However, there are some studies which show that the relationship between financial development and economic growth depends on indicators of financial development. For example, Kar et al. (2011) examine the nexus between financial development and economic growth in the MENA countries using panel causality test approach developed by Konya (2004). Six indicators of financial development are used and they include the ratio of narrow money to income, quasi-money, broad money (M2), the ratio of deposit money bank liabilities to income, private sector credit and domestic credit relative to income. They find out that the direction of causality between financial development and economic growth is sensitive to the measures of financial development in the MENA countries. The findings support evidence on both demand following and supply leading hypotheses. Therefore, the direction of causality seems to be country and financial development indicator specific.

Also, Odhiambo (2008) considers a dynamic test of finance-led growth hypothesis in Kenya using annual time series from 1968 to 2002. The ratio of M2 to GDP, the ratio of bank claims on the private sector to nominal GDP and the ratio of currency to narrow definition of money are the measure of financial development. The dynamic Granger causality test reveal that the causality between financial development and economic growth in Kenya is sensitive to the choice of measurement for financial development. The ratio of M2 to GDP shows bi-directional causality while the ratio of currency to narrow definition of money and the ratio of bank claims on the private sector to nominal GDP shows a distinct demand following response.

Finally, some studies do not see any link between finance and growth. One of them is the study by Gries et al. (2009). They examine the linkages between financial deepening, trade openness and economic development in 16 Sub-Saharan African countries. Financial development is measured by the ratio of broad money to GDP and Hsiao Granger causality test is employed. They detect only limited supports for causal interaction of financial depth and economic development. In particular, there is only sparse support for the hypothesis of finance-led growth and for most of the study there is insignificant relationship between finance and growth.

3. Methodology and Data

The model employed in this study is derived from supply leading hypothesis, which states that financial development causes growth. This hypothesis is deeply rooted in the work of McKinnon (1973) and Shaw (1973), which stress that a regulated interest rate and government intervention in the financial market lead to financial repression. Low interest rate discourages saving and promotes inefficient investment and, hence hinders economic growth and development in the developing countries. However, financial liberalization through deregulation of interest rate ensures efficient allocation of funds to productive investment. Also, high interest rate will attract savings from the household in the form of bank deposits, which will increase the supply of loanable funds. This, in turn, will lead to greater investment and hence high economic growth.

McKinnon (1973) and Shaw (1973) construct a theoretical link between financial liberalization and economic growth and implicitly highlight how finance leads to economic growth (Kar et al. 2011). In order to show the link between financial development and economic growth, it is useful to consider the following production function, which expressed output as a function of capital stock:

$$y_t = f(k_t) \tag{1}$$

Where y_t and k_t denote output and capital stock at time t respectively. Taking the total differential of equation and divide through by y, we have:

$$\frac{dy_t}{y} = \frac{dk_t}{y_t} f'(k_t) \tag{2}$$

$\frac{dy_t}{y_t}$ is the growth rate of output, $\frac{dk_t}{y_t}$ is the savings rate and $f'(k_t)$ is the marginal product of capital. Let us represent the output growth by $\widehat{Y_t}$, the savings rate by S_t and the marginal product by Ψ_t. This therefore yields the equation:

$$\widehat{Y_t} = S_t \Psi_t \tag{3}$$

Equation 3 means that the growth rate of output is the product of savings rate and marginal productivity of capital.

In the traditional growth literature, emphasis is placed on the dynamic process of capital where output converges to a steady-state equilibrium. This is possible because of decreasing marginal productivity of capital. At the steady state, output per capita and all variables that determine it grow at a constant rate. In the context of equation (3), as k_t grows over time, marginal productivity of capital tends to zero and hence, growth rate of output becomes zero. However, the new growth theory (endogenous growth theory) considers a situation where marginal productivity of capital does not converges to zero as capital grows over time. Here, emphasis is placed on the situation where output grows endogenously in the absence of exogenous productivity growth (De Gregorio and Guidotti, 1995).

Financial development affects economic growth in two ways: (i) the development of domestic financial market will enhance the efficiency of capital accumulation which will lead to increasing marginal productivity of capital (Ψ_t). (ii) Financial intermediation can lead to increase in savings rate (S_t) through high interest rate and, thus raising investment (DeGregorio and Guidotti, 1995). The first effect was first considered by Goldsmith (1969) where he finds out that financial development has a positive correlation with real per capita GNP. He attributes this positive effect to efficient use of capital accumulation brought about by financial development. On the other hand, McKinnon (1973) and

Shaw (1973) supports the second effect that financial liberalization through high interest rate increases household's savings (hence S_t) which bring about high level of investment. The focus of McKinnon (1973) and Shaw (1973) is on the effect of public policy on interest rate. They argue that financial repression that occurs as a result of low interest would serve as a disincentive to savings. Lower savings would translate to lower investment and growth.

Based on this hypothesis and following the work of Khan et al. (2005), the relationship between financial development and economic growth can be specified as:

$$GDP_t = f(DEPTH_t, BANK_t, PRIVY_t, INV_t) \tag{4}$$

Where:

GDP = Gross domestic product per capita

DEPTH = the ratio of liquid liabilities to GDP

BANK = the ratio of domestic money bank asset to domestic money bank assets plus the Central bank domestic assets

PRIVY = the ratio of claims on the non-financial private sector to GDP

INV = Investment, as measured by gross fixed capital formation.

In this study, the effects of the global economic meltdown of 2008 are considered. Thus equation 4 is modified to include a dummy variable in order to capture the effect of the financial crisis. This is thus specified below:

$$GDP_t = f(DEPTH_t, BANK_t, PRIVY_t, INV_t, DUM_t) \tag{5}$$

Where:

DUM = dummy variable for global economic meltdown

To estimate the model, I take the natural logs of equation (5) and this yields equation (6) below:

$$lnGDP_t = \alpha_0 + \alpha_1 lnDEPTH_t + \alpha_2 lnPRIVY_t + \alpha_3 lnBANK_t + \alpha_4 lnINV_t + \alpha_5 DUM_t + \epsilon_t$$
$$\tag{6}$$

$$lnDEPTH > 0, lnPRIVY > 0, \text{lnBANK} > 0, \text{and lnINV} > 0$$

The dummy variable captures the effects of global economic meltdown on the financial system. DUM = 0 for 1981-2007 and 2010-2018 and DUM = 1 for 2007-2009. ϵ_t is the error term where α_0 is the constant and α_1 to α_6 are parameter coefficients. With the exemption of the dummy, all other variables are expressed in logarithmic form. Moreover, all coefficients are expected to be positive.

3.1   Data Description

It is very difficult to capture financial development with a single indicator (King and Levine, 1993). From the work of King and Levine (1993), there are four ways to measure financial development. First is the ratio of liquid liabilities to GDP labelled as DEPTH which measures the financial depth; second, the ratio of domestic money bank domestic asset to domestic money bank assets plus the Central bank domestic assets (BANK) which measures relative importance of specific financial institution; the third and the fourth financial development indicators measure the domestic asset distribution. These include the ratio of claims on the non-financial private sector to total domestic credit (excluding credit to money banks, PRIVATE) and the ratio of claims on the non-financial private sector to GDP (PRIVY). However, in this study, I only make use of three indicators since PRIVATE and PRIVY measure the same aspect of financial system. Economic growth is measured by GDP per capita and gross fixed capital formation is used as a proxy for investment. The analysis is based on annual time series data from 1981 to 2018. All data are sourced from World Bank's World Development Indicator (WDI) and Central Bank of Nigeria Statistical Bulletin.

3.2   ARDL Bound Testing Approach

In order to estimate equation (6), the study adopts autoregressive distributed lag (ARDL) bound test approach proposed by Pesaran et al. (2001). Bound test approach is used because of its several advantages over other methods of cointegration analyses. For example, it does not require prior unit root testing since it does not impose restriction on the order of integration of the series. It is applicable irrespective of whether the series are I(0) or I(1) order of integration (Jalil et al., 2013). The ARDL estimator produces true parameters in comparison to Johansen and Juselius's cointegration technique. Also, it is super consistent in the case of small sample sizes. Furthermore, the ARDL approach takes care of endogeneity problem because it is free of residual correlation. Unlike the Johansen method, which has limited choices, the ARDL estimator permits the use of dummy variables in the estimation and diverse number of lags (Hoque and Yusop, 2010). Therefore, in the application of ARDL estimator, I include a dummy variable to capture the effect of global economic meltdown in Nigeria's financial system. The ARDL modeling of equation (6) is specified as follows:

$$lnGDP_t =$$
$$\alpha + \gamma_1 lnGDP_{t-1} + \gamma_2 lnDEPTH_{t-1} + \gamma_3 lnPRIVY_{t-1} + \gamma_4 lnBANK_{t-1} + \gamma_5 lnINV_{t-1} + DUM_t +$$
$$\sum_{i=1}^{p} \theta_i \Delta lnGDP_{t-i} + \sum_{i=0}^{p} \delta_i \Delta lnDEPTH_{t-i} + \sum_{i=0}^{p} \mu_i \Delta lnPRIVY_{t-i} + \sum_{i=0}^{p} \pi_i \Delta lnBANK_{t-i} +$$
$$\sum_{i=0}^{p} \tau_i \Delta lnINV_{t-i} + \varepsilon_t$$
$$(7)$$

In line with Pesaran et al. (2001), execution of ARDL bound test approach follows three steps: first, the existence of long-run cointegrating relationship among the variables has to be determined using the Wald-coefficient test or F-test. A joint significance test is performed on the null hypothesis that the coefficients of the one lagged level variables are equal to zero against the alternative hypothesis that the coefficients are statistically different from zero. In the present study, the

F-test is employed by setting $\gamma_1 = \gamma_2 = \gamma_3 = \gamma_4 = \gamma_5 = 0$, excluding the dummy variable. Then the estimated F-statistics is compared with the critical values enumerated by Pesaran et al. (2001) to know whether all the long run coefficients are jointly equal to zero. There are five cases regarding whether the model contains intercept and trend and the critical values are classified into upper and lower bounds. These bounds determine whether the variables are I(0), I(1) and mutually cointegrated. If the estimated F-statistics is below the lower bounds, then the null hypothesis of no cointegration cannot be rejected and if it falls in between the lower and the upper bounds, the test is inconclusive. However, if the estimated F-statistics lies above the upper bound, then the null hypothesis of no cointegration is rejected.

The second step involves the estimation of the long-run model. This is done if cointegration exists among the series in the first step and an error correction estimation is performed. However, if there is no cointegration, there will not be error correction representation and only short-run results will be reported. Finally, in the third step, the goodness of fit of the ARDL model is examined. Thereafter, relevant diagnostic and stability tests such as the normality test, serial correlation test, ARCH and heteroscedasticity associated with the model are conducted

Furthermore, in order to complement this study, a Granger causality test is conducted to find out the direction of causality between various indicators of financial development and economic growth in Nigeria. Specifically, this test is carried out to determine whether the relationship between financial development and growth in Nigeria follows supply leading hypothesis or demand following hypothesis or both.

As argued by Granger (1968), a variable say x, is said to Granger cause another variable say y, if both the past and present values of x predict y. This traditional Granger causality test is however based on bivariate relationship (i.e. a relationship between two variables). This forms part of its limitation. Gujarati and Porter (2009) point out that a Granger causality test that captures the link

between two variables and excludes the effects of other variables is subject to specification bias. Thus, the empirical results of two-variable Granger causality test may be bias. This study, therefore, employs VAR Granger causality test, which takes accounts of several endogenous variables in a model. The VAR Granger causality is specified as follows:

$$DEPTH_t =$$
$$\sum_{J=1}^{P} \varphi_{1j} DEPTH_{t-j} + \sum_{J=1}^{p} \varphi_{2j} GDP_{t-j} + \sum_{J=1}^{p} \varphi_{3j} PRIVY_{t-j} + \sum_{J=1}^{p} \varphi_{4j} BANK_{t-j} +$$
$$\sum_{J=1}^{p} \varphi_{5j} INV_{t-j} + \varepsilon_{1t} \quad (8)$$

$$GDP_t = \sum_{J=1}^{P} \theta_{1j} GDP_{t-j} + \sum_{J=1}^{p} \theta_{2j} DEPTH_{t-j} + \sum_{J=1}^{p} \theta_{3j} PRIVY_{t-j} + \sum_{J=1}^{p} \theta_{4j} BANK_{t-j} +$$
$$\sum_{J=1}^{p} \theta_{5j} INV_{t-j} + \varepsilon_{2t} \quad (9)$$

$$PRIVY_t =$$
$$\sum_{J=1}^{P} \alpha_{1j} PRIVY_{t-j} + \sum_{J=1}^{p} \alpha_{2j} GDP_{t-j} + \sum_{J=1}^{p} \alpha_{3j} DEPTH_{t-j} + \sum_{J=1}^{p} \alpha_{4j} BANK_{t-j} +$$
$$\sum_{J=1}^{p} \alpha_{5j} INV_{t-j} + \varepsilon_{3t} \quad (10)$$

$$BANK_t =$$
$$\sum_{J=1}^{P} \pi_{1j} BANK_{t-j} + \sum_{J=1}^{p} \pi_{2j} GDP_{t-j} + \sum_{J=1}^{p} \pi_{3j} \quad RIVY_{t-j} + \sum_{J=1}^{p} \pi_{4j} DEPTH_{t-j} +$$
$$\sum_{J=1}^{p} \pi_{5j} INV_{t-j} + \varepsilon_{4t} \quad (11)$$

$$INV_t = \sum_{J=1}^{P} \varphi_{1j} INV_{t-j} + \sum_{J=1}^{p} \varphi_{2j} GDP_{t-j} + \sum_{J=1}^{p} \varphi_{3j} PRIVY_{t-j} + \sum_{J=1}^{p} \varphi_{4j} BANK_{t-j} +$$
$$\sum_{J=1}^{p} \varphi_{5j} DEPTH_{t-j} + \varepsilon_{5t} \quad (12)$$

This multivariate causality test requires as a precondition, the estimation of a corresponding VAR model as specified in equations 8 –12.

3.3   Test of Unit Root

Even though the ARDL bound testing estimation technique does not require the pre-testing of the variables, the unit root testing is performed to confirm the other of integration of the series. Enders (1995) in Hoque and Yusop (2010) suggested that Augmented Dickey-Fuller (ADF) and Phillips Perron (PP) should be used as safer methods of testing unit roots. If the two methods corroborate

each other, then the results are more reliable. Therefore, ADF and PP tests are conducted on the variables of the model to test for their unit roots. The tests are performed at level and first difference for both the intercept and the trend term.

Table 1   **Unit Root Test Results**

	Augmented Dickey-Fuller (ADF)			**Phillip Perron (PP)**		
Variable	Level Constant with trend	First Constant with trend	I(q)	Level Constant with trend	First Constant with trend	I(q)
BANK	-3.8226**	-6.9399***	I(0)	-3.7352**	-13.8707***	I(0)
DEPTH	-3.3511*	-4.8094***	I(0)	-2.1865	-7.2682	I(1)
GDP	-2.0993	-4.3467***	I(1)	-2.0980	-4.8524***	I(1)
INV	-2.9945	-3.0947**	I(1)	-3.2186	-5.1625***	I(1)
PRIVY	-2.3305	-5.7537***	I(1)	-2.2024	-9.4545***	I(1)

Source: Author's computation from E-view 9. Note:***,**, and * imply significance at 1%, 5% and 10% respectively.

For Augmented Dickey-Fuller (ADF) test, BANK and DEPTH are integrated of order zero I(0) and the other variables (GDP, INV and PRIVY) are integrated of order one I(1). However, the result of the Phillip Perron (PP) shows that all the variables are I(1) except BANK that is I(0). Therefore, the results of the unit root test show that the bound test estimating technique is suitable for the analysis.

4.   Discussion of Results

The results for the existence of long-run relationship among the variables are presented in table 2. The test for cointegration shows that the computed F-statistic of 11.58 exceeds the lower and upper bound critical values of 3.74 and 5.06, respectively at 1 per cent significant level. This shows that the null hypothesis of no cointegration among the variables can be rejected. Thus, there exists a long-run relationship among GDP, BANK, DEPTH, PRIVY and INV.

Table 2　　　　　　**Bounds Tests for the Existence of Cointegration**

Dependent variable	Critical value	F-Statistic = 11.5880[a]	
		Lower bound	Upper bound
F_{GDP}(gdp bank, depth, privy, inv, dum)	1%	3.74	5.06
	2.5%	3.25	4.49
	5%	2.86	4.01
	10%	2.45	3.52

Sources: Author's computation from E-View9. Notes: Estimation period (1981–2018) and all calculations were made using E-view 9. F-test is the statistics for testing zero restrictions on the coefficients of the lagged level variables in the particular model. The superscript a, indicates that the statistic lies above the upper bound. Source of critical values: Pesaran et al. (2001).

4.2　Short-run and Long-run Dynamics

The short-run dynamics of the model show that most of the variables are statistically significant. $\Delta BANK_{t-1}$, $\Delta DEPTH_{t-2}$, $PRIVY_{t-2}$ and ΔINV_{t-2} are all statistically significant at 1 per cent. The estimated lagged error correction term (ECM_{t-1}) is negative and highly significant. This supports the cointegration among the variables represented by equation (1). The feedback coefficient of -0.18, suggests that, approximately, 18 per cent of the disequilibria from the previous year's shock converge or adjust back to the long-run equilibrium in the current year.

Table 3   Error Correction Representation of the ARDL (1,3,4,2,4) Selected on the Basis of AIC

Variable	Coefficient	Std. Error	t-Statistics
$\Delta BANK_t$	0.1069	0.0386	3.4541**
$\Delta BANK_{t-1}$	0.0828	0.0501	1.6509
$\Delta BANK_{t-2}$	-0.1122	0.0502	-2.2365**
$\Delta BANK_{t-3}$	-0.0787	0.0456	-1.7231
$\Delta DEPTH_t$	-0.0507	0.0607	-0.8357**
$\Delta DEPTH_{t-1}$	-0.1466	0.0576	-2.5426**
$\Delta PRIVY_t$	-0.1044	0.0417	-2.5012**
$\Delta PRIVY_{t-1}$	0.1180	0.0414	2.8489**
$\Delta PRIVY_{t-2}$	-0.0551	0.0361	-1.5283
$\Delta PRIVY_{t-3}$	-0.0648	0.0326	-1.9884
ΔINV_t	0.1483	0.0429	3.4541***
ΔINV_{t-1}	-0.0714	0.0398	-1.7954*
ΔINV_{t-2}	0.08480	0.0299	2.8361**
ΔDUM	0.0544	0.0244	2.2262**
ECM_{t-1}	-0.1776	0.0773	-2.2970**
R-squared	0.8715	F-statistic	4.9996
Adjusted R-squared	0.6972	Prob (F-statistic)	0.0018

Source: Author's computation from Eview 9. Notes: Δ means the first difference and ECM$_{t-1}$ is the error correction term. The superscripts ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

The long-run coefficients are presented in table 3. All the variables except DEPTH which is measured as the ratio of broad money to GDP do not conform to the a priori expectation. Four of the variables are statistically significant apart from DEPTH. BANK and INV are statistically significant at 5 per cent. While PRIVY is statistically significant at 10 per cent, DUM has a significant level of 1 per cent.

Table 4   Estimation of Long-run of ARDL (1,3,4,2,4)

Dependent Variable: GDP

Variable	Coefficient	Std. Error	t-Statistic	
Constant	-7.1883	8.5077	-0.8449	
BANK	1.9168	0.7941	2.4136**	
DEPTH	-0.2916	0.3295	-0.8850	
PRIVY	1.1772	0.5753	2.0460*	
INV	0.6977	0.3407	2.0477**	
DUM	-0.3062	0.1315	-2.3283**	
Diagnostic Test	RESET	JB	LM	ARCH
F-statistic	2.1887	1.6744	2.0124	0.7240
P-value	0.1628	0.4329	0.1795	0.4013

Source: Author's computation from E-View9. Notes: ***, ** and * denote statistical significance at 1%, 5% and 10 % level respectively. Δ means the first difference and F-test is the restriction test imposed on the parameter of the model. The test statistics are: LM = Lagrange multiplier test for autocorrelation; JB = Jarque–Bera test for normality of residuals; ARCH = Engle's autoregressive conditional heteroskedasticity test and RESET = Ramsey's test for functional form misspecification.

Noticeably, financial development measured by the ratio of private credit to GDP (PRIVY) contributes significantly to the economic growth of Nigeria. Its long-run coefficient indicates that one per cent increase in it will bring about 1.17 per cent rise in Nigeria's economic growth. This is actually in support of King and Levine (1993) that credit to the private sector contributes more to the economic growth than credit to the government. This is because productive resources are made used of more efficiently by the private sector and therefore is a good measure of financial development. Also, a one per cent rise in BANK increases economic growth by 1.91 per cent. Another variable that contributes positively and significantly to Nigeria's economic growth is investment (INV), measured by gross fixed capital formation. A one per cent rise in it will lead to 0.69 per cent increase in economic growth at 5 per cent significant level. Though this is contrary to the finding of Ogwumike and Salisu (2012) for Nigeria, it is conformable to the apriori expectation.

Contrarily, financial development measures by DEPTH contributes negatively to economic development of Nigeria. This is not a surprise, because previous studies on Nigeria have also found similar result. For instance, Ogwumike and Salisu (2012) have also found a negative relationship between financial depth and economic growth. Ogwumike and Salisu associate this poor performance of financial development and economic growth in Nigeria with three factors, namely macroeconomic instability due to high inflation; removal of foreign exchange control without appropriate measures to avoid rapid exchange rate depreciation; and the introduction of treasury bill (TB) auction which made TB rates more attractive to larger depositors who opted for TBs at the expense of time deposits. Furthermore, the coefficient of global economic meltdown dummy actually confirms that the economic meltdown affected Nigeria's economy negatively. This is in line with the a priori expectation. It worsens Nigeria's economic growth by 0.53 per cent and it is statistically significant.

Finally, a battery of diagnostic test is applied to the empirical model in order to ascertain the adequacy of the model. First, the F-statistics of Ramsey RESET test and ARCH test show that the residual of the model has constant variance. Moreover, the computed Breusch–Godfrey Lagrange multiplier (LM) tests of 2.0124 is not statistically significant. This shows that the null hypothesis of no serial correlation cannot be rejected and the Jarque-Bera for normality of residual indicates that the model is normally distributed. Therefore, despite the short span of the data, the outcome of the diagnostic tests indicates that the specification of the model is adequately specified and none suggest concern about the estimated model.

4.3   Granger Causality Test Result

As presented in table 5, the result reveals that at the individual level, two of the measures of financial development (BANK and PRIVY) Granger cause economic growth at 5 per cent while the other measure of financial development (DEPTH) Granger causes economic growth at 10 per cent. In terms of the joint significance, the result shows that all the measure of financial development has a causal effect on economic growth at 1 per cent significant level. However, there is evidence of reverse causation running from economic growth (GDP) to financial development. Overall, this result finds support for both supply leading and demand following hypothesis in Nigeria. Though this is against the findings of Ogwumike and Salisu (2012) for Nigeria who find support for supply-leading hypothesis, the results are in line with the findings of Osuji and Chigbu (2012) for Nigeria, who find a bi-directional causal relationship between economic growth and financial development.

Table 5   **Multivariate VAR Granger Causality Test Result**

Equation / Variable	Equation 8 DEPTH	Equation 9 GDP	Equation 10 PRIVY	Equation 11 BANK	Equation 12 INV	DUM
DEPTH	D.V	(4.8230) {0.0897}*	(0.4185) {0.4185}	(1.5722) {0.4556}	(4.0630) {0.1311}	(3.6087) {0.1646}
GDP	(6.9248) {0.0314}**	D.V	(5.6278) {0.0600}*	(0.1721) {0.9175}	(6.9248) {0.0314}**	(7.1313) {0.0283}**
PRIVY	(1.4004) {0.4965}	(7.4055) {0.0165}**	D.V	(0.3894) {0.8231}	(1.4004) {0.4965}	(5.0632) {0.0795}**
BANK	(0.4577) {0.7954}	(6.7806) {0.0510}**	(2.5399) {0.2808}	D.V	(0.4577) {0.7954}	(4.7495) {0.0930}**
INV	(2.7223) {0.2564}	(2.7096) {0.2580}	(0.4538) {0.7970}	(0.1601) {0.9231}	D.V	(2.0075) {0.3665}
DUM	(2.0780) {0.3538}	(0.7607) {0.6836}	(3.3144) {0.1907}	(3.4380) {0.1792}	(2.0780) {0.3538}	D.V
ALL	(24.2340) { 0.0070}***	(25.7057) {0.0068}***	(21.5218) {0.0177}**	(9.0869) {0.5239}	(24.2340) {0.0070}***	(19.4381) {0.0350}**

Source: Author's computation from E-View9. NOTE: ( ) = Chi-Sq, { } = Probability value, and D.V = Dependent Variable. ***, **, and * indicate significance at 1%, 5% and 10% respectively.

5. Conclusion and Policy Implication

This study empirically examines the impacts of financial development on Nigeria's economic growth from 1981 to 2018 using ARDL bounds test estimation technique. The results show a unique long-run relationship between financial development and economic growth in Nigeria. Therefore, financial development is an important determinant of economic growth in Nigeria. However, the impact of financial development on Nigeria's economic growth is

sensitive to financial development indicators. In the long run, while the ratio of private credit to GDP (PRIVY) and the ratio of commercial bank asset to the sum of commercial bank and the Central Bank assets (BANK) have positive effects on economic growth, financial depth measured by the ratio of broad money to GDP (DEPTH) has a negative effect on economic growth. Investment contributed positively to the growth of Nigeria's economy, but the global economic meltdown expectedly impacted the Nigeria's economic growth negatively as indicated by the dummy variable.

In the short run, most of the variables are statistically significant; thus, justifying evidence of lag effect between financial development and economic growth. Based on the foregoing, it is therefore recommended that the Central Bank should encourage effective means of improving credit channeling and liquidity to the private firms by banks since private credit contributes to the growth of the economy. Moreover, government policies should be geared towards promoting a more competitive environment that will enhance service delivery among financial institutions. Finally, the government should look inward and diversify the economy in order to mitigate the effect of external shocks on Nigeria's economy.

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