



Effect of Financial Deepening on Economic Growth in Nigeria: A Time Series Appraisal (1986-2018)

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Authors' contributions

This study was carried out in collaboration among all authors. Author PCN conceptualized the study, wrote the first draft of the manuscript and critically reviewed it thereafter. Author DCO sourced and managed relevant literature. Author ACA sourced the data, performed the analysis and interpreted the result of the analysis. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/AJARR/2019/v7i330181

Editor(s):

(1) Dr. Azizur Rahman, Department of Chemical and Physical Sciences, University of Toronto, Davis Building, Canada.

Reviewers:

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Complete Peer review History: <http://www.sdiarticle4.com/review-history/52016>

Original Research Article

**Received 16 August 2019
Accepted 22 October 2019
Published 12 December 2019**

ABSTRACT

The influence of financial deepening on the economic growth of any nation cannot be underestimated. To this end, the study evaluated the effect of financial deepening on economic growth in Nigeria over a period of thirty three (33) years: 1986 to 2018. Data were collected from statistical bulletins of the Central Bank of Nigeria (CBN) and factbooks of the Nigerian Stock Exchange (NSE). The model estimation followed the Auto-regressive Distributive Lag (ARDL) approach with the effect estimated in line with the Granger Causality analysis. We found that economic growth in Nigeria is not affected by financial deepening. The study also stated that the level of growth in the economy is what influences the level of development in the banking sector. The implication is that the Central Bank of Nigeria and the Security and Exchange Commission (SEC) should formulate and implement policies geared toward the deepening of the banking sector

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and the capital markets to help in the efficient and effective mobilization of resources to accelerate the growth of the Nigerian economy. The insurance sector should not be left out in this regard even though citizens seem not to embrace the need for insurance policies. Impediments to the competition in the banking, insurance and capital market activities should be removed by strict legislation in line with international best practices and participants in the markets be protected as well.

Keywords: Financial deepening; economic growth; ARDL; Nigeria.

1. INTRODUCTION

Financial deepening and economic growth nexus as a subject matter have gained recognition in finance literature owing to the irrefutable role of financial sector development in economic growth. The level of development in the financial system undoubtedly determines the magnitude of funds that can be mobilized from surplus economic units and channel to deficit units for production. The financial system vigorously seeks out and attract the reservoir of savings and idle funds and allocate same to entrepreneurs, businesses, households and government for investments projects and other purposes with a view of returns and this forms the basis for economic development [1]. In a deepened financial system, the cost of fund is normally low due to the availability of varieties of financial instruments and effective intermediation functions of the financial intermediaries compared to a less deepened financial sector. Deepening the financial sector helps in reducing risks faced by firms and businesses in their productive processes, improvement of portfolio diversification and the insulation of the economy from the vicissitudes of international economic changes [2]. Financial deepening enhances economic performance through improved competitive efficiency within financial markets which indirectly is of benefit to non-financial sectors of the economy [3]. In an attempt to deepen the financial system to accelerate the pace of economic growth in Nigeria, monetary authorities over the years have initiated and implemented various policies geared towards stability in the financial system. Nzotta and Okereke [2] observe that the reforms in Nigeria's financial system with special reference to the introduction of Structural Adjustment Programme (SAP) in 1986, affected the level of financial deepening of the country and the level relevance of the financial system to economic development.

With financial deepening, wealth would be created and economic growth sustained, the poor will have greater access to financial

services which in turn reduces the rate of poverty. Access to financial services tend reducing income inequality in the economy and encourage entrepreneurial growth. With repute to entrepreneurial growth, Paramaditha [4] is of the view that financial deepening is needed to provide financing to the small and medium enterprises as a result of crowding out by large corporations, and that with a deeper financial sector, larger corporations can raise funding more easily through bonds and equity, so that banking can lend to small and medium enterprises. John and Ibenta [5] empirically proved that entrepreneurial growth in Nigeria would be positively affected by deepening the financial sector. Results from empirical studies across the globe as stated by Paramaditha [4] have shown that financial deepening has a significant function in supporting economic growth, mitigating systemic risk, sustaining financial stability and trimming down poverty and inequality levels. Also, when global volatility occurs, financial deepening can help to slow the effect and prohibit it from falling into a deeper crisis, as the market has a better structure and is built with better defence mechanisms.

Emerging economies need to deepen the financial sector to mobilize the necessary resources needed to attain a viable level of growth and development. Financial markets development via the creation of a variety of financial instruments should complement banking sector reforms to complete deepening of the financial sector to significantly affect economic growth and development. The existence and development of the financial markets bring about a higher level of saving and investment and enhance the efficiency of capital accumulation [6]. The opportunities that sustain growth in an economy is lubricated by the handiness of liquid money – financial deepening. The intermediation functions of the financial superstructure have the capability to enhancing efficiency in the economy, create and expand liquidity, mobilize resources from surplus economic agents and transfer same to deficit units, improves gross

fixed capital formation, and consistent with Tin [6], transfer resources from tradition (non-growth) sectors to the more modern growth-inducing sectors and also promote a competent entrepreneur response in the modern sectors of the economy. Efficient intermediation functions of the financial superstructure would stimulate financial intermediaries in the economy to do more to generate efficient allocation which is growth-inducing.

In measuring financial deepening in Nigeria, emphases have been on the banking sector development proxies [7-18], while few focused on stock market deepening. To best of my knowledge based on empirical literature reviewed in the Nigerian situation, the insurance sector development has been ignored, hence the gap this study sought to fill by using recent data on the variables of interest and following a superior methodological approach by means of Autoregressive Distribute Lag (ARDL) model by specifically ascertaining the effect of banking sector, stock market and insurance sector deepening on economic growth in Nigeria.

2. RELEVANT LITERATURE REVIEW

In this section: relevant literature review, we tried as much as possible to make it to be very precise by going straight to the basic definition of the terms in the subject matter. In the words of Nzotta [19] who is a prominent academic scholar in the field of banking and finance in Nigeria, financial deepening is simply put as an increased ratio of the money supply to Gross Domestic Product. Adigwe, Nwanna and Ananwude [20] are of the perspective that economic growth is a positive change in the output or production of a country or an economy, and this description involves all aspects of an economy, from profits to taxes and wages, to such things as production rates. With regard to theoretical consideration, we are of the view that finance is necessary for economic growth as well as the development of our dear country Nigeria despite several odds such as embezzlement of the public fund (by those in corridors of power), corruption and ethnicity issues by government in the realm of affairs among others. Our assertion is a follow up of the supply leading hypothesis that financial development promotes economic growth, because the creation of financial instruments, institutions and markets improve the supply of financial services, which enhance economic growth even though there is contrasting view to this regard via the demand following hypothesis

and feedback hypothesis. The demand following hypothesis states that it is the level of economic development that determines the level of economic growth, while the feedback hypothesis believes that finance propels the growth of the economy on one hand, while on the other hand, the level of growth of the economy enhances the availability of financial instrument which determines or is a gauge to the level of financial development or deepening in an economy. With this exploration, we reviewed relevant empirical studies in this subject area in subsequent paragraphs.

Aye [21] investigated the role of financial development on economic growth in Nigeria. Since a causal link may evolve over time, a bootstrap rolling window approach was used to account for potential time variation in the relationship with annual Nigerian data on money supply as a ratio of nominal GDP and real GDP per capita from 1961-2012. Starting first with a full sample bootstrap Granger causality, the results indicated no causality between the two series. The relevant VAR was unstable for the full sample which undermines the confidence in the bootstrap full sample Granger causality tests.

Modebe and Ezeaku [11] evaluated the relationship between financial development and economic growth in Nigeria, taking exception from existing literatures by integrating broad distinctive indicators of financial development into their model and using different econometric techniques to assess the finance-growth link between 1987 and 2014. The findings indicated that financial development and economic growth move along together in the long run. It was revealed that credit to the private sector, stock market capitalization and inflation have a negative impact on the economy, while broad money supply, trade openness and foreign direct investment exerted a positive influence on the economy.

Nwanna and Chinwudu [7] examined financial deepening and economic growth in Nigeria from 1985 to 2014. The study adopted the supply leading hypothesis. The study used annual time series data for 1985 to 2014 obtained from the Central Bank of Nigeria statistical bulletin. The Ordinary Least Square (OLS) econometric technique was employed in which variations in the dependent variable, economic growth, measured by gross domestic product growth rate was regressed on money supply ratio to gross domestic product, private sector credit ratio to

gross domestic product, market capitalization ratio to gross domestic product and financial saving ratio to gross domestic product. The result of the analysis revealed that both bank-based and stock market financial deepening proxies have a significant and positive effect on economic growth.

Alenoghena [14] investigated the contributions of capital market and financial deepening to economic growth in Nigeria over the period of 1981 to 2012. The analysis involved examining the stochastic characteristics of each time series variable by testing their stationarity using Augmented Dickey-Fuller (ADF) test and estimated the error correction mechanism model. The study revealed that Stock Market Capitalization, Narrow Money Diversification (involving credit to the private sector) and Interest Rate significantly impacted on the promotion of economic growth.

Nwafor and Aremu [3] focused on the economic impact of financial deepening in Nigeria. Obtained data spanning from 1997 to 2016 was presented and analysed in a line chart and with Two-staged Least Squares Regression method respectively. After subjecting the hypothesis under testing, the result showed that financial deepening has a significant impact on economic growth.

Yildiz and Atasaygin [22] assessed the relationship between financial deepening and economic growth in the Turkish economy for the period from 1984:01-2014:12. The industrial production index was used as a representative of economic growth. The variables of the stock index of Istanbul, bonds and stocks were used as financial development indicators. They concluded that there is a co-integration relation among variables. According to the results, the demand-pulling hypothesis was valid for the Turkish economy. They found that there was evidence that the growth of the economy was as a result of financial development.

Alrabadi and Kharabsheh [23] investigated the dynamic relationship between financial deepening and economic growth in Jordan over the period (1992-2014). Vector autoregressive regressions, Granger causality and Johansen-Juselius cointegration tests were employed. Using quarterly data, the results indicated no statistically significant effect of financial deepening on economic growth in the short run. However, the co-integration tests showed a

statistically significant long-run equilibrium relationship between the two variables regardless of the proxy used for financial deepening. Moreover, the Granger causality test shows a bi-directional causality between economic growth and financial deepening when the latter is measured by the amount of credit granted to the private sector.

Best, Francis and Robinson [17] empirically examined the question of whether bank liquid reserves to bank assets ratio and domestic credit to the private sector as a percentage of GDP strengthens financial deepening on the real sector and hence catalyses economic growth in Jamaica. A Granger causality approach was employed within a multivariate framework. The empirical evidence suggested a 'supplying-leading' relationship in both the short and long run.

Igwe, Edeh and Ukpere [24] determined the impact of financial deepening on economic growth in Nigeria. The supply leading hypothesis was adopted as the theoretical framework of the study. Data for analysis was for the period 1981-2012 were obtained from the Central Bank of Nigeria Statistical Bulletin. The explanatory variables were logged values of broad money supply/GDP and Credit to the private sector/GDP. The time series data were tested for stationarity using the ADF unit root tests of stationarity and were found to be stationary at first difference. The Engle-Granger Co-integration technique and Error correction model was used for the test of long-run relationship. Findings revealed that money supply (MS) was positive and weakly significant in determining economic growth.

Torruam, Chiawa and Abur [18] investigated the impact of financial deepening on economic growth in Nigeria. The stationarity properties of the data and the order of integration of the data were tested using both the Augmented Dickey-Fuller (ADF) test and the Phillip-Perron (PP) test. The Johansen approach of co-integration was applied to test for the long-run relationship among the variables. The result indicated four (4) co-integrating relations between the variables; the Granger-causality suggested that there was unidirectional causality running from economic growth to financial deepening in Nigeria.

Ohwofasa and Aiyedogbon [25] assessed the level of development of financial deepening in the banking sector and the extent it has impacted

on economic growth. Vector autoregressive (VAR) methodology and its derivatives, impulse response function and variance decomposition, were employed. The findings showed that the series are co-integrated and that long run relationship existed between the variables. The results of the VAR estimates revealed among other things that a one year lag of economic growth, gross national saving as a ratio of GDP (lag 1) and exchange rate (lag 1) have significant positive impact on current economic growth while the impact of GCF (lag 1) on the current level of economic growth was negative and statistically significant. It was also empirically discovered that PSC/GDP (lag 2) and GNS/GDP (lag 2) happened to be key determinants of M2/GDP. Similarly, the key determinants of PSC/GDP include its year 1 and 2 lagged values and GNS/GDP (lag 2) with GNS/GDP (lag 2) and PSC/GDP (lag 2) exhibiting negative impact. Finally, on the current level of GNS/GDP, it is observed that M2/GDP (lag 1) and PSC/GDP (lag 2) exhibit significantly negative determining influence while PSC/GDP (lag 1) and the past value of GNS/GDP (lag 2) were also seen as its key determinant.

Safdar [26] examined the long run relationship between financial deepening (FD) and economic growth (GDP) for Pakistan with inclusive of foreign direct investment (FDI) and inflation (INF). Stationarity among variables was examined through ADF which showed that all the variables were stationary at level $I(0)$. Using Johansen's Co-integration test, the study found that financial deepening; foreign direct investment, inflation and economic growth are co-integrated. Results of VECM showed the existence of short run relationship among variables and error correction model for GDP and FD showed the adjustment effect back towards long run. The Granger causality test showed the presence of unidirectional relationship among variables.

Karimo and Ogbonna [27] examined the direction of causality between financial deepening and economic growth in Nigeria for the period 1970–2013. The study adopted the Toda–Yamamoto augmented Granger causality test and results showed that the growth-financial deepening nexus in Nigeria follows the supply-leading hypothesis. This means that it is financial deepening that leads to growth and not growth leading financial deepening.

Ademola and Marshal [28] investigated the effect of financial deepening on the performance of

manufacturing firms in Nigeria from 1970 to 2016. The data were sourced from the Central Bank of Nigeria Statistical Bulletin and the National Bureau of Statistics. The model was specified and the hypotheses were tested with the Autoregressive Distributed Lag model and Mann-Whitney U Test test. The Augmented Dickey-Fuller, Phillips-Perron and Breusch-Pagan-Godfrey tests were carried out to ensure robust regression results. Results obtained from the study revealed that broad money supply has direct and significant impact on index of manufacturing production (p -value= 0.0039) in Nigeria, credit to private sector has indirect and statistically insignificant impact on index of manufacturing production (p -value= 0.1167) in Nigeria and market capitalization has an indirect and statistically significant impact on index of manufacturing production (p -value= 0.0051) in the long-run and a direct and statistically insignificant impact (p -value= 0.1596) in the short-run.

Okafor, Onwumere and Ezeaku [29] ascertained the causality and impact study on financial deepening and economic growth in Nigeria for a 33-year period covering 1981 – 2013. The study used the Phillips-Peron test for unit root to ascertain whether the variables are stationary or not. Test for a long run relationship was conducted with the aid of the Johansen co-integration test. The findings revealed that there is a long run relationship between economic growth, broad money supply and private sector credit, with high speed of adjustment towards long run equilibrium.

Conventionally, the kind of development in the financial system determines the degree of financial deepening in the economy. From the literature, there abound evidence that financial sector deepening has significant effect on the growth and development of the economy thus financial sector deepening is necessary to attain a desired level of development in the economy. However, we used relevant data to re-examine this assertion in the context of Nigeria.

3. METHODOLOGY

3.1 Empirical Estimation

Fully aware of the fact that the data on the variables concerned were purely secondary in nature, we employed the granger causality approach in estimating the effect of financial deepening on the growth of Nigerian economy.

We are econometrically convinced beyond a reasonable doubt that the granger causality estimation portrays the ability of one variable to predict another and when a variable cannot cause another to move, then effect estimation would seem difficult to be realized. We disaggregated financing deepening into: Banking Sector Development (BSD) measured by private sector credit to RGDP, Stock Market Deepening (SMD) reflected by market capitalization to RGDP and Insurance Sector Deepening (ISD) defined in term of total insurance assets to RGDP, while economic growth was defined in term of Real Gross Domestic Product (RGDP). Stated clearly, we estimated the short-run relationship between the variables of interest using the Auto-regressive Distributive Lag (ARDL) regression model on the fact that most time series are not stationary at the same level (some may be stationary at level, while other at first difference or second difference). Taking cognizance of the aim of this study, we developed a model as:

$$RGDP = f(BSD, SMD, ISD) \quad (1)$$

The econometric transformation of Equ. (1) by ensuring equal numerical base of the dependent and independent variables to aid easy interpretation of coefficient values thus:

$$\text{LogRGDP}_t = a_0 + a_1 \text{LogBSD}_t + a_2 \text{LogSMD}_t + a_3 \text{LogISD}_t + u_t \quad (2)$$

Where, BSD = Banking sector development measured by private sector credit to RGDP SMD

= Stock market deepening reflected by market capitalization to RGDP ISD = Insurance sector deepening defined in term of total insurance assets to RGDP

a_0 is constant-coefficient

a_1, a_2 and a_3 are the coefficients of the explanatory variables

u is a random error term and

t is the time trend; normally included in standard time-series specifications to account for the omitted variables in the model.

4. RESULTS OF EMPIRICAL ESTIMATION

4.1 Test for Stationarity

Our empirical estimation began with the determination of the stationarity properties of the data via the Augmented Dickey-Fuller (ADF) Test and Phillips Perron (PP) approach. The result of the stationarity test in Tables 1 – 2 prove that the data have no stationarity defect that might act as a peril to the output of the regression.

4.2 Residual and Stability Tests

We performed three sensitivity analysis: serial correlation, heteroskedasticity and Ramsey Reset Specification. The p-values of the f-statistics for serial correlation, heteroskedasticity and Ramsey Reset Specification in Table 3 are greater than 0.05 (insignificant at 5% level of significance). With this, we deduce that the model pass the three sensitivity analysis stated.

Table 1. ADF test result at first difference

Variables	Intercept	Trend and intercept	None	Remark
RGDP	-5.845965 (0.00)*	-5.817428 (0.00)*	-5.783277 (0.00)*	Stationary
BSD	-3.083678 (0.04)**	-4.058895 (0.01)*	-2.386734 (0.01)*	Stationary
SMD	-4.945138 (0.00)*	-4.892688 (0.00)*	-4.697761 (0.00)*	Stationary
ISD	-6.108815 (0.00)*	-5.971154 (0.00)*	-6.216342 (0.00)*	Stationary

Source: Output data from E-views 10.0

Note: The optimal lag for ADF test is selected based on the Akaike Info Criteria (AIC), p-values are in parentheses where (*) and (**) denote significance at 1% and 5%, respectively

Table 2. PP test result at first difference

Variables	Intercept	Trend and intercept	None	Remark
RGDP	-5.845965 (0.00)*	-5.818222 (0.02)**	-5.783141 (0.00)*	Stationary
BSD	-2.801516 (0.05)**	-3.108861 (0.04)**	-2.256340 (0.03)**	Stationary
SMD	-10.19266 (0.00)*	-9.867158 (0.00)*	-10.40025 (0.00)*	Stationary
ISD	-13.19974 (0.00)*	-12.51882 (0.00)*	-13.36257 (0.00)*	Stationary

Source: Output data from E-views 10.0

Note: In determining the truncation lag for PP test, the spectral estimation method selected is Bartlett kernel and Newey-West method for Bandwidth, p-values are in parentheses where (*) and (**) denote significance at 1% and 5%, respectively

Table 3. Sensitivity analysis

	F-statistic	P-value
Serial Correlation LM Test	0.326590	0.6581
Heteroskedasticity Test	0.532103	0.7736
Ramsey Reset Specification	0.927712	0.4447

Source: Output data from E-views 10.0

Table 4. ARDL regression of financial deepening and economic growth

Variables	Coefficient	Prob.
RGDP(-1)	1.701646	0.0000
RGDP(-2)	-0.740983	0.0002
BSD	31.48370	0.7788
BSD(-1)	163.1216	0.1473
SMD	20.98392	0.3168
ISD	-34.75861	0.8670
C	213.6594	0.7924
Adjusted R-squared	0.996493	
F-statistic	1374.314	
Prob(F-statistic)	0.000000	
Durbin-Watson stat	1.820238	

Source: Output data from E-views 10.0

4.3 ARDL Regression Estimation

The relationship in the short run between the regulatory environment and financial intermediation was appraised by the ARDL estimation. The different order of integration of the data guided the choice of ARDL. Adjusted R-squared, F-statistic and Durbin Watson statistic are three global model utility employed. Similarly, the relative statistics of the variables were not ignored. Table 4 provides evidence of a positive relationship between economic growth, banking sector and stock market development, while a negative relationship was observed for insurance sector development and economic growth in Nigeria. A unit rise in banking sector and stock market development lead to 31.48 and 20.98 factor appreciation in the real gross domestic product, whereas a percentage increase in insurance sector development results in 34.76 factor decrease in real gross domestic product. When financial deepening is held constant, economic growth would worth ₦213.66 million. With respect to the adjusted R-square, financial deepening significantly explained 99.65% of the variation in Nigeria's economic growth (f-statistic of 0.00 is significant at 5% level of significance). From the Durbin Watson value of 1.80, there is no issue of autocorrelation in the model.

4.4 Granger Causality Analysis

In testing the effect of financial deepening on economic growth in Nigeria, the Granger Causality analysis was employed. Evidence from

Table 5 shows that financial deepening measured by the banking sector, stock market and insurance sector development has no significant effect on economic growth in Nigeria. There is no causality flow from financial deepening to economic growth at 5% significance level. However, it is worth to note that Table 5 shows that there is causal relationship between real gross domestic product and banking sector development. Causality runs from real gross domestic product to banking sector development as 5% significance level. In other words, it is the rate of growth in the economy that determines the level of banking sector development. This does not support the evidence of the fact that Nigeria economic activities depend on the funds from the banking sector compared to the stock market and insurance sector.

4.5 Concise Discussion of Our Major Finding

The ARDL result in Table 4 provides the existence of a positive relationship between banking sector development, stock market and economic growth in Nigeria. This is an indication that the level of development in the financial system is necessary for the realization of growth and development in an economy. This supports the findings of Modebe and Ezeaku (2016) and Nwanna and Chinwudu (2016). The Granger Causality test in Table 5 suggested that financial deepening has no significant effect on economic

Table 5. Granger causality analysis

Null hypothesis	Obs	F-Statistic	Prob.	Remarks
BSD does not Granger Cause RGDP	31	0.28212	0.5995	No Causality
RGDP does not Granger Cause BSD		6.85411	0.0141	Causality
SMD does not Granger Cause RGDP	31	0.51172	0.4803	No Causality
RGDP does not Granger Cause SMD		0.11256	0.7398	No Causality
ISD does not Granger Cause RGDP	31	0.47368	0.4970	No Causality
RGDP does not Granger Cause ISD		3.83276	0.0603	No Causality

Source: Output data from E-views 10.0

growth in Nigeria. This is to say that Nigeria's economic growth has not been significantly influenced by the level of financial sector development. This may be attributed to the fragmented nature of the financial system. This is an affirmation of the result of Aye (2015) and Nwafor and Aremu (2016) on the idea that economic growth is not determined by the level of development in a country's financial system.

5. CONCLUSION AND POLICY IMPLICATION

In this study, we evaluated the extent to which economic growth in Nigeria is influenced or affected by financial deepening. In the course of this, we found that economic growth in Nigeria is not affected by financial deepening. We found also that the level of growth in the economy is what influences the level of development in the banking sector. The implication is that the Central Bank of Nigeria and the Security and Exchange Commission (SEC) should formulate and implement policies geared toward the deepening of the banking sector and the capital markets to help in the efficient and effective mobilization of resources to accelerate the growth of the Nigeria economy. The insurance sector should not be left out in this regard even though citizens seem not to embrace the need for insurance policies. Impediments to the competition in the banking, insurance and capital market activities should be removed by strict legislation in line with international best practices and participants in the markets be protected as well.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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