

A BOUND TEST ANALYSIS OF FINANCIAL INCLUSION AND ECONOMIC GROWTH: EVIDENCE FROM NIGERIA

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Abstract

Nigeria with a current population of 223.8 million people is faced with only 21 commercial banks, 860 Microfinance banks, 5 discount houses, 64 finance companies, and 5 development finance banks to care for all these people. The introduction of a universal banking system in Nigeria which enables the commercial banks in the country to offer all-inclusive financial services other than commercial banking brought a remarkable reform in the financial sector. However, the challenge of these 223.8 million people accessing these financial services at an affordable rate is a problem of concern in Nigeria. This study examined the relationship between financial inclusion and economic growth in Nigeria using annual time series data of some selected financial inclusion indicators in the Nigerian financial sector. It adopted the Granger causality test and an autoregressive distributed lagged model otherwise known as the Bound test to examine, both the short and long-run impacts of financial inclusion on economic growth in Nigeria. The causality results revealed that there is a unidirectional causal relationship flowing from loan to small and medium-scale enterprise to economic growth in Nigeria while loan of rural bank branches has a bidirectional causal relationship with economic growth in Nigeria. The result of the co-integration analysis revealed that there is a long-run relationship between financial inclusion and economic growth in Nigeria. Also, for the short-run impacts, deposits of rural bank branches, the number of bank branches, and loans to the agricultural sector have a significant positive impact on economic growth in Nigeria. Therefore, to achieve rapid economic growth in Nigeria, government and monetary authorities should ensure the promotion of banking services and the establishment of bank branches deeper in the rural areas to increase financial inclusiveness in the economy.

Keywords: *Financial Inclusion, Economic Growth, Bound Test, Causality*

1.0 Introduction

Financial inclusion has received increasing attention from both researchers and policymakers in the past two decades as a potential source of benefits to the economy. In Nigeria, for up to four decades, financial Inclusion has been an integral part of her financial industry reforms, from the rural banking scheme in 1977 to the establishment of community and microfinance banks in the 1990s and early 2000s. The government hoped that the rural banking scheme would help achieve the transformation through the following: Provide a platform for the mobilization of savings in the rural areas; encourage banking habits among the largely agrarian rural population; provide credit for the growth

of the small-scale industries and entrepreneurs and; promote balanced development and eventual reduction in the rural-urban migration (Okorie, 1990).

Nigeria with a current population of 223.8 million people is faced with only 21 commercial banks, 860 Microfinance banks, 5 discount houses, 64 finance companies, and 5 development finance banks to care for all these people. The introduction of the universal banking system in Nigeria which enables the commercial banks in the country to offer all-inclusive financial services other than commercial banking brought a remarkable reform in the financial sector. However, the challenge of these 223.8 million people accessing these financial services at an affordable rate is a problem of concern in Nigeria. Guarantying all adults in the society access to a broad range of financial services seamlessly, aimed at solving their needs, and delivered at affordable costs is the main aim of financial inclusion as studies show that financial exclusion leads to poverty. Available data shows that financial services are not made readily available to everyone that needs them for some reasons which could be a lack of awareness (financial illiteracy), an unfavourable regulatory environment, rigid product structure, etc. (Serrao, Sequira & Varambally, 2013). The banking sector in Nigeria has grown tremendously in the last decades and it has become the delight for the establishment of branches of multi-national banks and foreign direct investments. However, according to the Central Bank of Nigeria (CBN), only 18% of Nigerians in the North formally have accounts in the bank, the North-West has the lowest rate of population that keeps their money in the banks with only 13%. The North-East followed with 15% and the North Central with 27% of the formally banked population (CBN, 2017).

The worrisome reality is that most African economies including Nigeria are run by a small fraction of the citizens, as such, in any economy where the majority of the citizens are financially excluded and unbanked, the implication might be a threat to the economy. For instance, according to the (CBN 2019), about 83% of the total money in circulation in the country is completely outside the banking system, this could lead to stagnant economic growth and consequently hinder economic growth. There is no consensus on the relationship between financial inclusion and economic growth, hence the need for this study.

2.0 Literature Review

2.1 Conceptual Literature

2.1.1 Financial Inclusion

Financial inclusion is the provision of access to financial services to all members of the population, particularly the poor and the other excluded members of the population (Ozili, 2018). Financial inclusion can also be defined as the delivery of banking services at an affordable cost to the vast sections of the disadvantaged and low-income groups (Dev, 2006). Financial inclusion is also defined as the use of, and access to, formal financial services (Sahay, Čihák, N'Diaye, Barajas, Mitra, Kyobe & Yousefi (2015). These definitions have one thing in common which is that they emphasize that each member of

the population should have access to available financial services (Ozili 2020).

2.1.2 Economic Growth

Economic growth can be regarded as an increase in the capacity of an economy to produce goods and services, compared from one period of time to another. In simplest terms, economic growth refers to an increase in aggregate production in an economy, which is generally manifested in a rise in the national income of the country. Increases in aggregate production frequently correlate with increased average marginal productivity. That leads to an increase in incomes, inspiring consumers to open up their wallets and buy more, which means a higher material quality of life and standard of living. It can be measured in nominal or real terms, the latter of which is adjusted for inflation, while the former is the current year prices of goods and services.

2.1.3 Theoretical Framework

This study uses an eclectic approach that anchors on two theories; the Public good theory of financial inclusion and Harrod-Domar Growth theory. The public good theory of financial inclusion argues for two things. First, is the delivery of formal financial services to the entire population, and second, is ensuring that unrestricted access to finance for everyone should be treated as a public good for the benefit of all members of the population. As a public good, individuals cannot be excluded from using formal financial services and individuals cannot be excluded from gaining access to financial services. All individuals will enjoy basic financial services without paying for them. Access to financial services to one individual does not reduce its availability to others, which means that all members of the population can be brought into the formal financial sector and everyone will be better off. Under this theory, all members of the population are beneficiaries of financial inclusion and nobody is left out (Ozili 2020). The basic idea of the Harrod-Domar model is that economic growth depends on the amount of capital that is available for investment and that the rate of capital accumulation is proportional to the rate of savings. These two theories form the basis for this study.

2.2 Empirical Literature

Several studies have been carried out on the Financial Inclusion growth nexus by different researchers across the globe. Some of these studies are reviewed below;

2.2.1 Empirical Literature of Foreign Economies

Estrada, Park, and Ramayandiet (2010) examined the impact of financial inclusion on real per capita income growth in developing Asia using panel data from 1987 to 2008 of 125 developing Asian countries. It was found that overall financial development has a positive effect on real per capita growth. Also, financial inclusion positively affects more positively on economic growth of the selected countries. Both financial development and financial openness have a positive effect on growth for developing Asian countries.

For Prochniak and Wasiak (2017), this study analysed the impact of the

development and stability of the financial sector on the economic growth of 28 EU and 34 OECD economies from 1993 to 2013. According to the study, domestic credit provided by the financial sector, bank nonperforming loans, bank capital to assets ratio, market capitalization of listed companies, turnover ratio of stocks traded, and the monetization ratio were used to measure the financial sector. Using the Blundell and Bond's GMM estimation method, it was found that credit creation and its enhancement was an important determinant for output growth. The relationship between domestic credit and GDP growth was negative, especially for EU countries in the post-crisis period. Whereas, bank capital to asset ratio had a positive relationship with GDP growth for OECD countries while having a negative relationship for EU countries. It was also observed that non-performing loans in total gross loans were negatively related to GDP growth. The next variable market capitalization gives an interesting result that both positive and negative type of relationship is found with output growth. When the level of capital market development becomes excessively high, then output growth becomes low after some stage. This is true for countries that have well-stabled capital markets. On the other hand, in countries having capital markets in the initial stage of development, the development of capital markets leads to faster output growth.

Harley, Adegoke, and Adegbola (2017), conducted an empirical study on the relationships between Financial Inclusion, economic growth, and poverty reduction in developing economies. The study made use of financial inclusion indicators such as; the number of active automated teller machines (ATM) and bank branches selected from three African countries from 2006 to 2015. Their result ascertained that Financial Inclusion fosters economic growth and reduces poverty in these countries.

Gretta (2017), examined the relationship between Financial Inclusion and Economic Growth in the Middle East and North Africa (MENA) and the BRICS region, by adopting a Vector Autoregressive (VAR) Model. The findings showed that Financial Inclusion promotes economic growth in MENA and BRICS regions.

Dixit and Ghosh (2013) investigated if financial inclusion is an instrument for inclusive growth in Indian states by using secondary data. It was found that to achieve economic growth there is a need for equal distribution of financial inclusion opportunities. The study realized that financial inclusion is a very important tool for achieving inclusive growth in the Indian economy.

2.2.2 Empirical Evidence from Nigeria

Nwafor and Yomi (2018) examine the relationship between financial inclusion and economic growth in Nigeria using annual time series data from 2001 to 2016 and adopted the two-stage Least Squares (2SLS) technique. The study revealed that financial deepening, bank credit to GDP, commercial bank deposits (CBD) from rural areas, and commercial bank loans which were financial inclusion variables have a significant impact

on economic growth in Nigeria and that financial industry intermediation has not influenced financial inclusion within the period under review. It was recommended that Nigerian banks should develop financial products to reach the financially excluded regions of the country as this will increase the GDP per capita of Nigeria and consequently economic growth.

In a related study, Anyanwu, Ananwude, and Nnoje, (2018) evaluated the effect of available microfinance banks' products in rural communities via rent savings, child education, and newborn and daily savings accounts on women empowerment. A descriptive survey design was utilized to realize their objective. Two hundred (200) questionnaires were distributed to respondents, out of which one hundred and ninety (190) were fully completed and used for the analysis. The study recommended the creation of more women-tailored products by microfinance banks. This will allow them the opportunity to choose from a variety of products and services that specifically suit their needs.

Olubanjo (2017) studied income, education, age, gender, urban-rural classification, and access, as key drivers of financial inclusion and analysed their impact on the likelihood of being banked in Nigeria. The study used a survey of over 20,000 respondents in 37 states in Nigeria from 2008 to 2016. Being a woman, a youth, and living in a rural area, however, have significant negative effects on financial inclusion. Also, the lower the average travel time to the nearest branch of a bank, the more likely an individual will be financially included in Nigeria.

Okoye, Adetiloye, Erin, and Modebe (2017) investigated the effect of financial inclusion as a strategy for economic growth and development enhancement in Nigeria. Data used were M2/GDP, CPS/GDP, loan-to-deposit ratio (L/D), and liquidity ratio (LR). OLS estimation technique was adopted. Findings revealed that explanatory variables were statistically significant in explaining F/GDP (financial institutions as a ratio of GDP) which was the dependent variable. It was concluded that Financial Inclusion is a growth driver.

Onaolapo (2015) studied the effects of Financial Inclusion on economic growth in Nigeria using time series data from 1982 to 2012 such as; GDP, money supply as a ratio of GDP (M2/GDP), credit to private sector as a ratio of GDP (CPS/GDP). Ordinary Least Square (OLS) technique was applied. The result indicates, among others, a significant effect of financial inclusion on economic growth.

Aina and Oluyombo (2014) investigated the economies of financial inclusion in Nigeria. The study found that though access to bank accounts is high, a majority of the respondents operate savings accounts. However, the bank account ownership penetration ratio of 1.4 accounts to an adult including inactive accounts is very low. The use of bank accounts in receiving money from, and sending money to family members living far away

helps to service and maintain good family bonds typical of Africans where family ties are held in high esteem. Most adults use their accounts between one and five times in a month but 24% of the accounts are inactive in receiving deposits while about 6.9% are inactive for withdrawal in a month. The most popular non-cash payment methods are ATM/Debit card and wire transfer/online payment. 59.58% of those who saved used a bank account, 32.5% saved with cooperative societies, and 26.25% used daily contributors and rotational savings schemes.

Mbutor and Uba (2013) studied a simple model showing the impact of financial inclusion on monetary policy in Nigeria between 1980 and 2012. The result of the study supported the notion that growing financial inclusion would improve the effectiveness of monetary policy. However, the coefficient of the number of bank branches has the wrong sign and this was explained by the fact that, in opening branches, banks mainly pursue profits but not financial inclusion which is a policy objective, so there are clusters of branches that are under-utilized while numerous locations which are considered not favourable for balance sheets are under-branched.

2.2.3 Summary of Empirical Literature

Having empirically reviewed the studies carried out by other researchers both in other countries and in the Nigerian economy, it was observed that all the studies reviewed observed a positive impact of financial inclusion on economic growth. However, most studies done for Nigeria included ATM in their model, whereas the policy for ATM started in 2004, it actually started fully in Nigeria in 2014 which does not give a good degree of freedom in the estimated model. Also, some studies added variables like MS/GDP as a proxy for Financial Inclusion. This does not give the true picture of Financial Inclusion and how it impacts economic growth in Nigeria. This makes the result spurious. Some studies spanned from 1982 up to 2015 (Okoye, et.al 2017; Onaolapo, 2015) among others. The scope of these studies does not capture extensively the period of financial inclusion implementation. This study differs as it captures the pre-financial Inclusion (2004) and the period of full implementation of the strategy till 2021. Also, methodologically, this study intends to find the long-run relationship between financial inclusion and growth by using most of the financial inclusion variables in a growth model to capture the technological changes in the Nigerian economy with the presence of labour and capital (proxy by gross fixed capital formation). This is what no previous researcher from the studies reviewed so far, to the best of our knowledge, has ever done. These give the gaps that this study intends to fill.

3.0 Research Method

3.1 Research Design

This study is on the relationship between financial inclusion and economic growth in Nigeria. To achieve this, the study adopts an ex-post factor research design. Ex-post factor (after-the-fact) research implies that the cause of an event has already occurred.

According to Ndiyo (2003), it is research in which the scientist has no direct control of the independent variables as is undertaken after the events have taken place and the data are already in existence. In this type of research design, though the researcher cannot manipulate the independent variables, they can create a situation that will generate the requisite data for analysis, Ndiyo (2003). It is a systematic empirical study that is most suitable for studies that aim at finding the effect of one variable or group of variables (independent variables) on another (dependent variable) thus suitable for this study. Also, this study will make use of quantitative data, precisely time-series data, which will be macroeconomic indicators derived from the Nigerian economy for its empirical analysis, while the method of data analysis will be confirmatory. The confirmatory analysis uses econometric techniques to falsify or confirm the formulated hypotheses of this study.

3.2 MODEL SPECIFICATION

In economics, growth is commonly modelled as a function of physical capital, labour force, and technology. The Post-Keynesian growth model designed by Harrod (1939) and Domar (1946) gives the Two-Gap Models of economic growth. These two pre-conditions are essentially rooted in the Nigerian economy. An economic growth model is based on economic theory to establish basic fundamental assumptions that allow proposing an interaction between the factors of production to explain the determinants of economic growth, Cuenca and Penagos (2014). Based on exogenous and endogenous growth theories, different models have been proposed to explain economic growth including the human factor, capital accumulation, and technological change among other factors of production. In this sense, Romer (1986), and Lucas (1998), present theoretical works that explain endogenous growth. Lucas (1998) presents three models of economic growth to describe the production of a country based on its levels of physical and human capital and its level of technological acquis, using a production function of Cobb-Douglas. The first model emphasizes the accumulation of human capital and technological change as determinants of economic growth, and considers, like Solow, that the rate of change of technology is exogenous and determines the stock of capital to maximize utility over time.

In the second model, it assumes that technological change is endogenous and important to the rate of growth. Its purpose is to find the trajectories that must be followed by the variables of control, per capita consumption, and effort destined to production, as well as the variables of state, level of knowledge, and stock of capital, and find that the growth of capital must be equal to the sum of the growth of the population and technological stocks. The third model emphasizes international trade and the accumulation of human capital through learning in action as engines of economic growth. Nevertheless; even when Lucas states that in developing countries the elasticity of substitution between factors of production is less than 1, he develops his work based on Cobb-Douglas's production function.

Therefore, based on these premises, the model of this study is specified as follows;

$$Y = f(A, K, L) \quad 1$$

Where;

Y = rate of economic growth (measured by changes in gross domestic product, GDP)

A = technological changes (this is captured by financial innovation or inclusion measures)

K = capital (measured by gross fixed capital formation, GFCF)

L = labour, captured by labour force

A (technological change) in equation 1 which is captured by financial inclusion is split into different financial inclusion variables used by this study. These are; Loans to small-scale enterprises (LSE), Loans to the agricultural sector (LAS), Private sector credit (PSC), Number of Bank branches in the country (NBB), Deposits of rural branches (DRB), Loans of rural branches (LRB). Thus, equation 1 is expanded to become;

$$GDP = f(LSE, LAS, PSC, NBB, DRB, LRB, GFCF, LABF)^2$$

Equation 2 in its estimated form is written as;

$$GDP = \beta_0 + \beta_1 LSE + \beta_2 LAS + \beta_3 PSC + \beta_4 NBB + \beta_5 DRB + \beta_6 LRB + \beta_7 GFCF + \beta_8 LABF$$

Where;

β_0 is the intercept otherwise known as the constant term, while $\beta_1 - \beta_8$ are estimated parameters measuring the effect of the explanatory variables in the specified model.

3.3 Data and source

The study adopts a secondary annual time series macroeconomic data. All the variables in the estimated model were sourced from the Central Bank of Nigeria Statistical Bulletin of various years and the Central Bank of Nigeria Annual Report and Financial Reports.

3.4 Estimation Procedures

We approach the issue of the relationship between financial inclusion and economic growth from Nigeria's experience in the following four stages: the stationary test using the Augmented Dickey-Fuller technique, the causality test; using the Granger-causality technique, and the autoregressive distributed lagged (ARDL) Model.

4.0 Empirical Results and Discussions

4.1 Unit Root Results

Table 4.1: ADF Unit Root Result

S/N	VARIABLE	T-STATISTICS	1% CRITICAL VALUE	5% CRITICAL VALUE	10% CRITICAL VALUE	LEVEL OF INTEGRATION
1	CPS	4.414625	-3.661661	-2.960411	-2.619160	I(0)
2	DRBB	-3.700183	-3.670170	-2.963972	-2.621007	I(1)
3	GFCF	-10.04491	-3.679322	-2.967767	-2.622989	I(1)
4	LAS	5.015613	-3.724070	-2.986225	-2.632604	I(0)
5	LRBB	-4.269878	-3.724070	-2.986225	-2.632604	I(1)
6	LSME	-6.820252	-3.670170	-2.963972	-2.621007	I(1)
7	NBB	-3.436962*	-3.670170	-2.963972	-2.621007	I(1)
8	GDP	9.795455	-3.661661	-2.960411	-2.619160	I(0)
9	LABF	-8.023375	-3.724070	-2.986225	-2.632604	I(1)

Source: computed by the authors

There is a general tendency for time series data to contain a unit root. Consequently, an attempt has been made to render the data stationary before specification and estimation. Moreover, as the residuals of non-stationary time series are correlated with their own lagged values, a standard assumption of ordinary least squares (OLS) theory, that disturbances are not correlated with each other, is violated. Hence, OLS estimates of such series are biased and inconsistent, and standard errors computed with such random walk variables are generally underestimated. In view of this, OLS is no longer efficient among linear estimators (Ndiyo, 2003). From the unit root results presented in Table 4.1, it is revealed that the macroeconomic variables in the estimated model are not integrated in the same order of integration. This implies that the OLS technique is not suitable for the estimation of the specified model. Hence, this study employs an autoregressive distributed lagged (ARDL) technique that is commonly used for determining the long-run relationship between macroeconomic variables in a system of interrelated time series and for analysing the dynamic impact of random disturbances on a system of variables. To use the ARDL method, it is pertinent to determine the maximum lagged value for both the dependent and the independent dynamic variables in the estimated model. In achieving this, the lag length criteria were adopted. The results of the lag length criteria are shown in Table 4.2.

The result indicated a maximum lag length of two (2). This is evident from the Final Prediction Error (FPE); Akaike Information Criterion (AIC); Schwarz information criterion (SIC) and Hannan-Quinn information criterion (HQ) indicators.

Table 4.2 Lag Length Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-267.2948	NA	11274992	19.05481	19.47914	19.18771
1	-251.3180	20.93501*	4047152.	18.02193	18.49341	18.16960
2	-248.2590	3.797454	3548159.*	17.87993*	18.39856*	18.04236*
3	-247.4551	0.942526	3643108.	17.89345	18.45923	18.07065

* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Source: computed by the authors

4.2 Causality Test

In this study, we adopted the pairwise Granger causality test to check the direction of influence of the key variables; economic growth and financial inclusion indicators. The Granger causality assumes that the information relevant to the prediction of the respective variables, economic growth, and financial inclusion, is contained solely in the time series data on these variables. The test involves estimating the following pair of regressions:

$$GDP_t = \sum_{j=1}^n \alpha_j FIN_{t-j} + \sum_{j=1}^n \beta_j GDP_{t-j} + U_{1t} \quad 4$$

$$FIN_t = \sum_{j=1}^n \lambda_j FIN_{t-j} + \sum_{j=1}^n \gamma_j GDP_{t-j} + U_{2t} \quad 5$$

Where it is assumed that U_{1t} and U_{2t} are uncorrelated. Equation (4) postulates that current GDP is related to past values of itself as well as that of Financial Inclusion (FIN), and equation (5) postulates a similar behaviour for Financial Inclusion. Replacing financial inclusion (FIN) with each of the financial inclusion indicators in the estimated model, the result of this test, shown in Table 4.3, indicates that there is a unidirectional causal relationship between GDP and credit to the private sector (CPS) in Nigeria, flowing from GDP to CPS. This implies that economic growth influences credit to the private sector while credit to the private sector does not in turn influence economic growth in Nigeria's economy. Also, economic growth has a unidirectional causal relationship flowing from itself to other financial inclusion variables except for loans of rural bank branches (LRBB) and loans to small and medium-scale enterprises (LSME). For these variables, while the loan to small and medium-scale enterprises (LSME) has a unidirectional causal relationship with economic growth flowing from LSME, the loan of rural bank branches (LRBB) has a bidirectional causal relationship with economic growth in Nigeria. The result of the causality test indicates a feedback effect from the dependent variable then prompted the use of ARDL in this study as the use of the OLS technique will give a biased and inconsistent estimation because of the violation of a crucial assumption of the OLS (assumption 6): μ is independent of the explanatory variable(s). Symbolically;

$$Cov(X\mu) = E\{[X_i - E(X_i)] [\mu_i - E(\mu_i)]\} = 0 \quad 6$$

4.2 Causality Test Results

Table 4.3: Pairwise Granger Causality Results

Pairwise Granger Causality Tests

Lags: 2

Null Hypothesis:	F-Statistic	Prob.
GDP does not Granger Cause CPS	21.8928	3.E-06
CPS does not Granger Cause GDP	0.38143	0.6868
GDP does not Granger Cause DRBB	4.46407	0.0220
DRBB does not Granger Cause GDP	0.47634	0.6266
LAS does not Granger Cause GDP	0.61882	0.5466
GDP does not Granger Cause LAS	2.74545	0.0836
LRBB does not Granger Cause GDP	3.44418	0.0477
GDP does not Granger Cause LRBB	3.21821	0.0571

LSME does not Granger Cause GDP	3.48722	0.0462
GDP does not Granger Cause LSME	0.28784	0.7523
MS does not Granger Cause GDP	0.77539	0.4713
GDP does not Granger Cause MS	11.6290	0.0003
NBB does not Granger Cause GDP	0.99349	0.3844
GDP does not Granger Cause NBB	3.51896	0.0450

Source: computed by the authors

The result of the co-integration analysis using the Bound test as indicated in Table 4.4 reveals that there is a long-run relationship between financial inclusion and economic growth in Nigeria. This is because the F-statistics of 22.8 is greater than the critical values in all the levels of significance both in the lower $I(0)$ and upper boundary $I(1)$. Therefore, the macroeconomic variables in the estimated model are co-integrated and the financial inclusion in Nigeria affects the level of economic growth.

4.3 ARDL Bound Test Result

Table 4.4: Bound Test Result

Test Statistic	Value	Significance	
		I(0)	I(1)
F-Statistic	22.80666	1% - 3.976	1% - 5.691
K	6	5% - 2.794	5% - 4.148
		10% - 2.334	10% - 3.515

Source: computed by the authors

Moreover, since there is a long-run relationship between the variables in the estimated model, the study examines both the short and long-run impacts of each of the explanatory variables on the dependent variable (economic growth) in Nigeria. Table 4.5 depicts the short-run impacts of the financial inclusion indicators in the Nigerian financial sector on the level of economic growth. From the results, deposits of rural bank branches (DRBB) have a significant positive short-run impact on economic growth in Nigeria. Also, economic growth proxy by changes in GDP has significant positive short-run impacts on the present level of economic growth in Nigeria. It is also observed that loan to the agricultural sector (LAS) has a significant positive short-run impact on economic growth in Nigeria. However, loans to small and medium-scale enterprises (LSME) have insignificant negative short-run impact on economic growth. The same impact is observed from loans from rural bank branches (LRBB) on economic growth.

In addition, the number of bank branches in Nigeria (NBB) has a significant positive short-run impact on economic growth. The short-run impact results imply that financial inclusion indicators in the Nigerian economy promote economic growth in the short run and are statistically significant in the estimated model. The results further reveal that the financial inclusion indicators that have negative short-run impacts on economic growth are not statistically significant in the estimated model.

4.4 Short-Run Impacts

Table 4.5: ARDL Short-Run Results

VARIABLE	COEFFICIENT	T-VALUE	PROBABILITY
C	-11477.77	-4.5256888	0.0009
GDP(-1)	0.494158	2.752097	0.0188
GDP(-2)	1.945468	7.377499	0.0000
DRBB(-1)	38.62820	3.068849	0.0107
LAS(-1)	34.04660	3.211906	0.0083
LSME(-1)	-3.280060	-0.241803	0.8134
NBB(-1)	5.378121	9.258563	0.0000
D(LRBB)	-4.230987	-1.468490	0.1700
D(LRBB(-1))	2.348957	1.301853	0.2196
D(DRBB(-1))	-32.46226	-2.480448	0.0305
D(LAS(-1))	23.18384	2.809992	0.0170

Source: computed by the authors

In the case of the long-run impacts, table 4.6 presents the results. From the results, it is observed that loan from the rural bank branches (LRBB) has a positive but not significant long-run impact on economic growth in Nigeria, while rural bank branch deposits (DRBB) have a significant negative long-run impact on economic growth. However, credit to the private sector (CPS) has a significant positive impact on economic growth. The rest of the financial inclusion indicators in the estimated model have positive long-run impacts on economic growth except the number of bank branches (NBB) which has a significant negative impact on growth. Money supply in the estimated model has a significant positive effect on economic growth in Nigeria.

The coefficient of multiple determinations in the estimated model shows that the model best explains the level of economic growth in Nigeria as the value implies that 99.9 per cent of variations in the level of economic growth in Nigeria are explained by the estimated model. From the F-statistics value, it is seen that the entire model is statistically significant as the value is very high and hence, higher than the tabulated F-statistics at a 5 per cent level of significance ($F_{0.05}(8, 22)$) which is 2.40. Therefore, the F-statistics (calculated) of 6221.6 is greater than the F-statistics (tabulated) of 2.40. This makes the entire model to be statistically significant and best explains the Nigerian economy. The Durbin-Watson statistical value of 1.9 reveals that the estimated model is free from autocorrelation or serial correlation problems.

4.5 Long-Run Impacts

Table 4.6: ARDL Long-Run Results

VARIABLE	COEFFICIENT	T-VALUE	PROBABILITY
C	23226.93	2.117569	0.0578
LRBB	3.165888	0.491930	0.6324
DRBB	-78.16971	-2.637092	0.0231
CPS	7.980570	2.157518	0.0539
LAS	68.89820	3.455007	0.0054
LSME	-6.637673	0.240440	0.8144
NBB	-10.88340	-2.488012	0.0301
GFCF	-0.009058	-0.027831	0.9783
MS	2.174648	2.197080	0.0503
R-Squared		0.999902	
ADJ. R-Squared		0.999741	
F-Statistics		6221.635	
Durbin-Watson Statistics		1.932586	

Source: computed by the authors

5.0 Summary, Conclusion, and Policy Recommendations

5.1 Summary of Major Findings

The empirical analysis of the relationship between financial inclusion and economic growth in Nigeria reveals the following findings;

1. There is a long-run relationship between financial inclusion in the Nigerian Financial sector and economic growth. This is evident from the Bound test which shows a high F-statistics value. This means that financial inclusion affects economic growth in Nigeria.
2. There is a significant positive impact of financial inclusion on economic growth in Nigeria. This is in line with Gretta (2017); Dixit & Ghosh (2013); Anyanwu et al. (2018).
3. There are significant positive short-run impacts of Deposits of rural bank branches (DRBB), loans to agricultural sector (LAS), and number of bank branches (NBB) on economic growth in Nigeria.

5.2 Conclusion and Recommendations

In this paper, we explored the contributions of financial inclusion indicators to economic growth in Nigeria through; a review of empirical studies; and theoretical issues; and centred on empirical findings using an econometric method of causality test and autoregressive distributed lagged (ARDL) analysis. From our findings, we discovered that financial inclusion in Nigeria has a bidirectional effect on gross domestic product (GDP). This means that an increase in the level of financial inclusion in the Nigerian economy will lead to an increase in economic growth. This is in line with previous studies conducted both in Nigeria and in foreign economies like Nwafor & Yomi (2018); and Gretta (2017). Our findings show that financial inclusion in the Nigerian economy is a propeller to rapid economic growth. Therefore, to achieve rapid economic growth in Nigeria the study came up with the following policy recommendations.

5.2.1 Policy Implications and Recommendations

Having concluded from the findings of the study, the researcher therefore makes the following recommendations.

Since broad money supply (M2) has a positive significant effect on economic growth in Nigeria, the monetary authorities in Nigeria (Federal Ministry of Finance and CBN) must adopt a good policies mix that ensures that the majority of the narrow money supply (M1) is made up of currency in circulation; thereby reducing the amount of money outside banks.

The rural bank branches should be encouraged to grant loans to private businesses and the agricultural sector as well as small-scale enterprises to further promote economic growth.

Also, since the deposits in the rural bank branches positively affect economic growth in the estimated model, the rural bank branches should be encouraged to provide incentives to depositors and savers. This will encourage deposits and positively influence economic growth.

The government and monetary authorities should ensure the promotion of banking service and the establishment of bank branches deeper in the rural areas to increase financial inclusiveness in the economy and thereby promotes economic growth in our economy.

References

- Aina, S. & Oluyombo, O. (2014).** The Economy of Financial Inclusion in Nigeria: Theory, Practice and Policy, Chartered Institute of Bankers of Nigeria Occasional Papers Series 1(1), 1- 32.
- Alter, A. and B. Yontcheva. 2015.** Financial Inclusion and Development in the CEMAC. IMF Working Paper. WP/15/235.
- Anyanwu, F. A., Ananwude, A. C. & Nnoje, A.I. (2018).** Financial Inclusion: Nigeria's Microfinance Model Effect Assessment On Women Empowerment, European Journal of Human Resource Management Studies 1(2)
- Central Bank of Nigeria (2017).** National Financial Inclusion Strategy. Summary report January.
- Central Bank of Nigeria (2019).** Annual Statistical Bulletin, Abuja.
- Centre for Financial Inclusion, (2013).** ACCION International; Financial Inclusion: What is the Vision
- Cuenca M and Penagos I 2014** Apuntes del CENES 33(58) 11
- Dev, S. M. (2006).** Financial inclusion: Issues and challenges. Economic and political weekly, 4310-4313.
- Dixit, R. and M. Ghosh. 2013.** Financial Inclusion for Inclusive Growth of India - A Study of Indian States. International Journal of Business Management & Research (IJBM) 3(1): 147-156.
- Domar, Evsey (1946). "Capital Expansion, Rate of Growth, and Employment" Econometrica. 14 (2): 137-147. doi:10.2307/1905364. JSTOR 1905364*
- Estrada, G., D. Park and A. Ramayandi. 2010.** Financial Development and Economic Growth in Developing Asia. Asian Development Bank (ADB) Economics Working Paper Series No. 233.
- Gretta, S. (2017).** Financial Inclusion and Growth. The Business and Management Review.
- Harley, T. W., Adegoke, A. J., & Adegbola, D. (2017).** Role of Financial Inclusion in Economic Growth and Poverty Reduction Role of Financial Inclusion in Economic Growth and Poverty Reduction. Internal Journal of Research in Economics and Social Sciences (IJRESS), 265-271
- Harrod, Roy F. (1939). "An Essay in Dynamic Theory". The Economic Journal. 49 (193): 14-33. doi:10.2307/2225181. JSTOR 2225181.*
- Kunt, A. D., Klapper, L., Singer, D., Ansar, S. & Hess, J. (2017).** The Global Findex Database 2017, Measuring financial inclusion and the fintech revolution. World Bank Group. <https://globalfindex.worldbank.org>
- Lucas, R. (1988).** On the Mechanics of Economic Development. Journal of Monetary Economics. 22: 3-42.
- Martinez, M. V. (2011).** The Political Economy of Increased Financial Access. Georgetown: A thesis submitted in Partial fulfillment of the requirement for the Degree of Master of Public Policy to the Faculty of the Graduate School of Arts and

- Sciences Georgetown University.
- Mbutor O. M. & Uba, I. A. (2013). The impact of financial inclusion on monetary policy in Nigeria. *Journal of Economics and International Finance* 5(8), 318-326
- Ndiyo, N. A., (2003). A Dynamic Analysis of Monetary Policy and Poverty in a Small Open Economy; The Nigerian Experience, Processed.
- Nwafor, M. C. & Yomi, A. I. (2018). The Nexus between Financial Inclusion and Economic Growth: Evidence from Nigeria, *International Journal of Research and Innovation in Social Science (IJRISS)* 2(4).
- Okorie, A. (1990) "Rural Banking in Nigeria: Determining the appropriate Policy Variables". A Research Report - African Rural Social Science Series
- Okoye LU, Adetiloye KA, Erin O, Modebe NJ. (2017) Financial inclusion as a strategy for enhanced economic growth and development. *Journal of Internet Banking and Commerce.* ;22(8):1- 12.
- Olubanjo, M.A. (2017). The Drivers of Financial Inclusion in Nigeria. *The International Journal of Business & Management.* 273, 5 (7) July, 2017
- Onaolapo, A. (2015). Effects of financial inclusion on the economic growth of Nigeria. *International Journal of Business and Management Review*, 3(8), 11-28.
- Prochniak, Mariusz. and Katarzyna, Wasiak. (2017). The impact of Financial system on economic growth in a context of the global crisis: empirical evidence of the EU and OECD countries. *Empirica* 44: 295-337.
- Ozili, P. K. (2018). Impact of digital finance on financial inclusion and stability. *Borsa Istanbul Review*, 18(4), 329-340.
- Ozili, P. A. (2020) Theories of Financial Inclusion *MPRA* paper No. 101810.
- Romer, P. M. (1986). Increasing returns and long-run growth. *Journal of Political Economy*, 94(5), pp. 1001-1037.
- Sahay, R., Čihák, M., N'Diaye, P. M. B. P., Barajas, A., Mitra, S., Kyobe, A., ... & Yousefi, S. R. (2015). Financial inclusion: Can it meet multiple macroeconomic goals? (No.15/17). Washington: International Monetary Fund.
- Serrao, M.V., Sequeira, A.H. & Varambally, K.V.M. (2013). Conceptual framework to investigate the accessibility and impact of financial inclusion. *Indian Journal of Research*, 2(9), 47-49
- Sethi, D. & Acharya, D. (2017). Financial inclusion and economic growth linkage: some cross country evidence. *Journal of Financial Economic Policy*, 10(3), pp. 369-38

Appendix**ARDL Long Run Form and Bounds Test****Dependent Variable: D(GDP)****Selected Model: ARDL(2, 2, 2, 0, 2, 1, 1)****Case 2: Restricted Constant and No Trend****Date: 09/16/23 Time: 17:53****Sample: 1990 2021****Included observations: 30**

Conditional Error Correction Regression				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-11477.77	2536.027	-4.525888	0.0009
GDP(-1)*	0.494158	0.179557	2.752097	0.0188
LRBB(-1)	-1.564449	3.147824	-0.496994	0.6290
DRBB(-1)	38.62820	12.58719	3.068849	0.0107
CPS**	-3.943664	0.689771	-5.717351	0.0001
LAS(-1)	-34.04660	10.60012	-3.211906	0.0083
LSME(-1)	-3.280060	13.56503	-0.241803	0.8134
NBB(-1)	5.378121	0.580881	9.258563	0.0000
D(GDP(-1))	-1.945468	0.263703	-7.377499	0.0000
D(LRBB)	-4.230987	2.881181	-1.468490	0.1700
D(LRBB(-1))	2.348957	1.804318	1.301853	0.2196
D(DRBB)	-12.16105	15.81537	-0.768939	0.4581
D(DRBB(-1))	-32.46226	13.08725	-2.480448	0.0305
D(LAS)	0.776467	4.767053	0.162882	0.8736
D(LAS(-1))	23.18384	8.250501	2.809992	0.0170
D(LSME)	31.54926	17.78754	1.773672	0.1038
D(NBB)	1.925259	0.885226	2.174879	0.0523
GFCF	-0.009058	0.325459	-0.027831	0.9783
MS	2.174648	0.989790	2.197080	0.0503

* p-value incompatible with t-bounds distribution.

- Variable interpreted as $Z = Z(-1) + D(Z)$.

Levels Equation Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LRBB	3.165888	6.435646	0.491930	0.6324
DRBB	-78.16971	29.64239	-2.637092	0.0231
CPS	7.980570	3.698958	2.157518	0.0539
LAS	68.89820	19.94155	3.455007	0.0054
LSME	6.637673	27.60640	0.240440	0.8144
NBB	-10.88340	4.374335	-2.488012	0.0301
C	23226.93	10968.68	2.117569	0.0578

$$EC = GDP - (3.1659*LRBB - 78.1697*DRBB + 7.9806*CPS + 68.8982*LAS + 6.6377*LSME - 10.8834*NBB + 23226.9279)$$

F-Bounds Test		Null Hypothesis: No levels of relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
Asymptotic: n=1000				
F-statistic	22.80666	10%	1.99	2.94
K	6	5%	2.27	3.28
		2.5%	2.55	3.61
		1%	2.88	3.99
Finite Sample: n=30				
Actual Sample Size	30	10%	2.334	3.515
		5%	2.794	4.148
		1%	3.976	5.691