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Impact of financial inclusion on economic growth in Nigeria

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Abstract
While the nexus between finance and economic growth is well debated in literature, the impact of financial inclusivity on economic growth still remains partially explored. This study empirically investigated the impact of financial inclusion on economic growth in Nigeria covering from the period of 1983 until 2019. The study constructed a novel index of financial inclusion in Nigeria using the Principal Component Analysis (PCA) and Autoregressive Distributed Lag and ECM approaches were employed to test the impact of financial inclusion on economic growth. Moreover, Bootstrap ARDL Cointegration technique was employed in testing the long run relationship between financial inclusion and economic growth. The findings revealed the existence of long run relationship between financial inclusion and economic growth. The findings also revealed that financial inclusion has a positive and significant impact on economic growth both in the long-run and in the short-run. The study in line with its findings and the methodology adopted, reiterated the positive effect of financial inclusion on economic growth in Nigeria. Among other things, the study recommended that, rural financial markets should be intensified and strengthened to encourage wider access to credits, specifically to low-income and vulnerable members of the community as this will improve its role in promoting economic growth in the country.

Keywords: Financial inclusion**,** economic growth, financial literacy

Introduction

Achieving an inclusive economic growth has been a major concern among the countries across the globe (Torruam, Chiawa & Abur, 2013; Ibrahim & Aliero, 2020). This is predicated by the fact that, inclusive economic growth can facilitate the reduction of the rate of poverty, unemployment, ensures improved public services and most importantly, attracts foreign investment (Usman, 2010). Contrary to this, according to Ajakaiye (2009), poor economic growth may have an adverse effect on the economy such as decreasing output level, low per capita income, low level of savings and investments, decreasing foreign direct investment, increasing unemployment etc. Economic growth has been defined as the process by which national output or national income is increased (Todaro, 1990).

Economic growth also refers to an increase in the capacity of an economy to produce goods and services compared from one period of time to another (World Bank, 2007). This advancement in economic performance can only promote well-being if it enshrines inclusivity. Therefore, inclusive economic growth has recently been considered as a foremost objective of national economic policy of every nation. In this way, the recent global development agenda of Sustainable Development Goals (SDGs) underscores the attainment of social inclusion in a sustainable manner (Ibrahim & Aliero, 2020).

In recognition of the teeming benefits of attaining sustained economic growth, Nigeria's government under different administrations introduced different policies and programs with the aim to place the economy on the path of achieving long-run macroeconomic objective of maintaining sustainable economic growth. Some of these policies and programs include among others; the Economic Stabilization Measures through the Economic Stabilization Act of 1982, Austerity Measures (1983) as economic policy program (as enunciated in the 1984 budget) to curtail the diminishing trends on the economy by placing the economy on a proper way of recovery and solvency and to plan a future route for economic stability and prosperity.

This core economic objective of the Nigerian government of achieving sustainable economic growth has drawn the attention of researchers and policy makers in the country to actually investigate the determinants of economic growth among which financial inclusion was identified and was explicitly made a policy objective in the country in April, 2005 (Ibrahim & Aliero, 2020; CBN, 2020). The growth of an economy of a nation measured in terms of percentage increase in Gross Domestic Product (GDP) although depends to a large extent on a number of variables, however, financial inclusion in this respect is paramount (Conroy, 2005). Levin & Zervos (2004) argued that, provision of adequate and affordable financial products and services to the unbanked population has a positive effect on economic growth. Therefore, the development of financial inclusion is critical in achieving sustainable economic growth. Moreover, empirical evidence has shown that, the level of financial inclusion in the economy is a predictor of future rates of economic growth, capital accumulation and technological advancement (Levin & Zervos, 2004; Conroy, 2005) [7].

According to Babajide, Adegboye, and Omankhalen (2014) [3]; Sarma (2015); Jisha and Varghese (2016), economic growth would be achieved at a faster rate if all segments of the population have access to financial services – financial inclusion. This is consistent with Kama and Adigun (2012), Babajide *et al*., (2014) [3] and Andrianaivo and Kpodar (2011). Specifically, more access to deposits no doubt will improve the ability of financial intermediaries to mobilize savings and greater access to finance will facilitate economic growth by increasing the capacity of individual households to venture into productive undertakings. Ajakaiye and Olowookere (2019) also affirmed that, development of the financial sector is expected to encourage

savings and capital formation, minimizes external financing constraints faced by companies and ultimately, engender higher growth. Overall, financial inclusion has potentials to engender inclusive growth of the economy.

Giving the high nominal value of currency outside banks including evidences of its continuous upward increase, the crucial question is: are government previous and contemporary efforts at stimulating financial inclusion in Nigeria to accelerating economic growth yielding desired outcomes? Providing answer to this question is the motivation of this study.

The success of financial inclusion in propelling economic growth in Nigeria is still minimal despite the efforts and commitments of the Nigeria's government highlighted above. This perhaps may be due to the poor nature of financial inclusion in the country. For instance, in Nigeria, it has been recently reported that, out of 95.7 million adult populations, a total of 39.2 million adult Nigerians, representing 46.3% Nigerian adults are financially excluded with regard to provision of banking and other financial services (Central Bank, 2019). This is an apparent indication that the nature of financial inclusion in the country is deprived and its relative impact on economic growth in the country is very low.

It is therefore, in the wake of this background that this study seeks to examine the impact of financial inclusion on economic growth in Nigeria from 1983 to 2019.

Objectives of the Study

The broad objective of this study is to examine the impact of financial inclusion on economic growth in Nigeria from 1983 to 2019. The study also aims to examine the existence of a long run relationship between financial inclusion and economic growth in Nigeria.

Conceptual framework and literature review

Financial inclusion is one of the social concepts that is controversially defined among different disciplines (Ibrahim *et al* 2019). The economic conception of the term was orientated within the broader context of inclusive development that considers inclusivity in financial services as an important means to tackle poverty and inequality (Ibrahim & Aliero, 2020). In recent times, financial inclusion has assumed greater level of importance owing to its apparent prominence as a driver of economic growth (Usman, 2010). Therefore, defining financial inclusion is considered crucial from the view point of developing a conceptual framework and identifying the underlying factors that lead to low level of access to the financial system. A review of literature suggests that, there is no universally acceptable definition of the phrase "financial inclusion". The definitional emphasis of financial inclusion varies from country to country and geographies, depending on the level of social, economic and financial development; the structure of stake holding in the financial sector as well as socio-economic characteristics of the financially excluded segments (Leyshon and Thrift, 1995) [16].

According to United Nation (UN, 2010); financial inclusion is the process that ensures the ease of access, availability and usage of the formal financial system for all members of the economy which will lead to an increase in their economic and social condition. World Bank (2018) on the other hand defined financial inclusion as the means by which individuals and businesses access useful and affordable financial products and services to meet their needs; and such services are delivered in a responsible and sustainable way. However, for the purpose of this study, the researcher aligned himself with United Nations (UN, 2010) by adopting their definition as a working definition in this study. The essence of adopting United Nation's definition as the researchers working definition is because it duly emphasized on the core indicators (measurable variables) of financial inclusion. These indicators include financial service accessibility, availability and usage of financial/banking services and system which are clearly explained in the next section of this study. The combination of these indicators with bank serving as the gateway no doubt brings about inclusive financial system.

The Major Targets/ Goals of Financial Inclusion

The United Nations (UN) identified two major targets of financial inclusions. One of the targets of financial inclusion according to United Nations is to provide access at a reasonable cost of all households and enterprises to a range of financial services for which they are bankable guided by an appropriate management. Another target of financial inclusion is to alleviate poverty in the society. Poverty alleviation has been a major objective of financial inclusion in countries of the globe.

Measures/ Indicators of Financial Inclusion

According to Obinna (2008), the access to appropriate financial services in the economy depends on its usage of formal, semiformal and informal financial services. The access to finance could be divided in to four segments as follows:

1. The proportion of the population that uses a bank or bank like institutions.
2. The proportion of the population that uses services from non-bank "other formal" financial institutions but do not use bank services.
3. The proportion of the population which uses services from informal financial service providers.
4. Proportion of the population transacting regularly through formal financial instruments.

Theoretical Framework

Theoretically, there are conflicting views on financial development-economic growth nexus. This resulted in the formation of four major hypotheses regarding this relationship. These are: supply-leading hypothesis pioneered by Schumpeter (1911); demand-following hypothesis proposed by Robinson (1952); feedback hypothesis championed by Patrick
(1966); and neutral hypotheses supported by Lucas (1988) among others.

1. Supply-Leading Hypothesis

The German economist Schumpeter was the pioneer of the supply-leading hypothesis of the finance-growth nexus. In his seminal work, Schumpeter (1911) argues that well-functioning banks spur technological innovation by identifying and funding those entrepreneurs with the best chances of successfully implementing innovative products and production processes. According to this view, the existence of financial institutions and the supply of their financial assets, liabilities and related financial services in advance of demand for them would provide efficient

allocation of resources from surplus units to deficit units, thereby leading the other economic sectors in their growth process. However, Schumpeter analysis lacks any analytical basis. Hence, empirical work by Goldsmith (1969) and McKinnon-Shaw (1973) illustrate close ties between financial development and economic growth. Goldsmith (1969) suggested that financial development has a positive impact on economic growth as it may boost the capital accumulation, efficiency and increase the level of saving and thus the level of investment.

The above realities prompted some economists to come up with the demand-following hypothesis.

2. Demand-following Hypothesis

In contrast to supply-leading hypothesis, Robinson (1952) contends that where enterprise leads, finance simply follows, suggesting that it is economic development which creates the demand for financial services and not vice versa. According to this view, economic growth creates demands for particular types of financial arrangements, and the financial system responds automatically to these demands. This hypothesis postulates a causal relationship from economic growth to financial development. Therefore, causality runs from economic growth to financial development, that is, an increase in economic growth causes a rise in demand for financial services and this results in the expansion of the financial sector. In this regard, all what country needs to do is to promote economic growth and financial development will automatically follow.

3. Interdependent Hypothesis

Patrick (1966) asserts that the relationship between finance and growth could vary over time. In particular, at the initial stage, financial development will lead economic growth; however as real growth takes place in the economy, this link becomes of lesser importance and growth will induce the demand for greater financial services. Thus, this hypothesis is a combination of the supply-leading and demand following hypotheses which is try to balance the two view points above. According to this view, the relationship between financial development and economic growth is very important. Thus, financial development and economic growth are mutually interdependent.

4. Independent (Neutrality) Hypothesis

Some economists just do not believe that the financial development-economic growth relationship is important. Lucas (1988) declares that economists badly over-stress the role of financial factors in economic growth. According to this view, the relationship between financial development and economic growth is not important. Hence financial development and economic growth are causally independent. The independent hypothesis however, has no sound footing as in real life transaction costs can never be zero; firms have to incur cost when borrowing from the financial market and if they excessively use internal financing, they will declare fewer dividends and their share price may fall. Additionally, recent financial crises and the collapse of many large corporations are suggestive of the existence of information asymmetry especially in the financial sector. It is worth to note that, these hypotheses are more or less based on intuition; they are not based on any growth model. Therefore, their analysis is rather one sided. Thus, the body of literature in recent years that recognized the positive role of financial intermediaries in the growth process is based on the endogenous growth model.

Empirical Literature

This section reviews various empirical studies conducted on the nexus between financial inclusion and economic growth across the globe. The studies are classified in to country specific and cross country studies.

Country Specific Studies

Burgess and Pandey (2007) examined the impact of financial inclusion on economic growth in India. The study used a time series data covering (1982-2015) and Ordinary Least Square Method was employed in analyzing the data. The findings from the result revealed that, financial inclusion has a positive and statistically significant effect on economic growth in India during the period covered by the study. Dupas and Jonathan (2009) studied the impact of financial inclusion on economic growth in Kenya. The study utilized a time series data covering the period (1985-2015) and Fully Modified Ordinary Least Square was employed in analyzing the data. The result indicated that financial inclusion is a significant determinant of economic growth in Kenya during the period of the study. Awdeh (2012) also studied the causality direction between financial inclusion and economic growth in Lebanon over the period 1992-2011. Applying Granger Causality tests, the author found a one-way causality running from economic growth to financial inclusion, measures such as deposit money banks deposits from rural branches and banking sector development. These results provide support for the demand-following hypothesis regarding the link between banking sector financing and economic growth in Lebanon.

Joseph (2015) conducted a research on the effect of financial inclusion and governance on economic progress in Nigeria. The study employed a time series data for the period 1980-2014 derived from CBN statistical Bulletin and a generalized method of moment (GMM) estimation technique was employed. The results indicate that financial inclusion and governance have positive and statistically significant effect on economic progress of Nigeria during the period of the study.

Onaolapo (2016) in his study examined the effects of financial inclusion on economic growth in Nigeria. According to the researcher, the data for the study spanning from 1982 until 2012 was collected from secondary sources comprising Statistical Bulletins of the Central Bank of Nigeria (CBN.), National Bureau of Statistics (NBS) and World Bank. Primary data used for the study consisted of some bank parameters as Branch Network, Loan to Rural Area, Demand Deposit, Liquidity Ratio, Capital adequacy, and Gross Domestic Product. Ordinary least square was employed in analyzing the data. The overall results of the regression analysis show that inclusive Bank financial activities greatly influenced poverty reduction but marginally determined national economic growth and Financial Intermediation through enhanced Bank Branch Networks, Loan to Rural Areas, and Loan to Small Scale Enterprise given about 50% relatedness between variables on either sides of the equations.

Cross- Country and Panel Studies

King and Levine (1993) investigated the impact of financial inclusion on economic growth of a cross-section of about 80

countries for the period 1960-89, and used the measures of the size of the banking financial intermediaries (i.e., credit to private sector) as an indicator of financial inclusion. This study found that the level of financial inclusion is a good predictor of long-run rates of economic growth, capital accumulation, and productivity improvements. Hassan, Sanchez, and Yu (2011) [10] also investigated the relationship between financial Inclusion and economic growth using the data of 168 countries from the period 1980-2007. In the estimated panel regression results, it was concluded that there was a strong positive relationship between financial inclusion and economic growth in developing countries. However, there was a negative relationship of economic growth with domestic credits provided by the banking sector and domestic credits to the private sector data in contrast to the result obtained of a positive relationship of gross domestic savings to GDP with economic growth.

In another study for developed countries, Eryilmaz, Bakir, and Mercan (2015) examined the role of financial development in accounting for economic growth in 23 Organization for Economic Cooperation and Development (OECD). Using panel data for the period 1980-2012, they found a positive relationship between financial development and economic growth for all countries. In the same vain, Law and Singh (2014) examined the relationship between finance and economic growth by employing an innovative dynamic panel threshold technique. The study sample consisted of 87 developed and developing countries. The findings showed that there was a threshold effect in the finance-growth relationship.

Harley, Adegoke and Adegbola (2017) have carried out an empirical study on the role of financial inclusion on economic growth and poverty reduction in a developing economy using panel data analysis covering 2006 to 2015 within a log linear model specification framework. From their regression result, the records of active ATM, bank branches and government expenditures selected from three Africa countries were the most robust predictors for financial inclusion on poverty reduction in a developing economy. According to them, one percent increase on ratio of active ATM will leads to about 0.0082 percent increase in the gross domestic product and a reduction of poverty in developing economy. According to them an indicator shows that most of the ATMs in developing economy are outdated and thus required technological upgrade to have a significant impact in rural areas. Their co efficient of determination was very high as it showed that about 92 percent of the total variations in real growth rate of gross domestic product are explained by all the independent variables in the model. Consequently, the researchers recommended that Government should focus on poverty reduction through focus on infrastructural development that will enhance banking and other financial institutions services.

Empirical methodology

This section contains a careful synthesis of the methods used in the analysis of the data to achieve the objectives of the study. a composite index of financial inclusion was generated in this study using E-VIEWS to measure the level of financial inclusion in Nigeria using Principal Component Analysis (PCA) using the following variables to capture its dimensions; Rural Dwellers Deposits with Rural Branches of Commercial Banks (RDD), Rural Dwellers Loans from Rural Branches of Commercial Banks (RDL), Deposit Money Banks loans to small scale enterprises (DLSE) and Bank Branches Spread (BBSP) by following the work of Wan & Guang, (2017), with slight modification. A series as Financial Inclusion Index (FII) was generated which was regressed against economic growth with Lending Rate (LRATE), Deposit Rate (DRATE) and Gross Fixed Capital Formation (GFCF) as control variables. The PCA is mostly used to overcome the issue of multi-collinearity, as well as the degree of freedom by generating an appropriate index for a particular variable (Nawaz *et al*, 2019,).

Empirical Model

The model specified to capture the impact of financial inclusion on economic growth was adopted by following Pagano (1993). The theoretical model of financial inclusion is specified as follows:

Economic growth = f (Financial Inclusion).

GDP = f (FI).

Thus, to achieve the first objective of this study, this model is specified:

$$lnGDP_t = \beta_0 + \beta_1 FII_t + \beta_2 LRATE_t + \beta_3 DRATE_t + \beta_4 GFCF_t + \mu_t \quad (1)$$

Where

- GDP_t – represents real Gross Domestic Product as a proxy for economic growth.
- FII- represent Financial Inclusion Index
- LRATE-represent Lending Rate.
- DRATE-represent Deposit Rates
- GFCF-represent Gross Fixed Capital Formation
- μ - error term with the usual stochastic assumptions.

Data Sources and Description

This study used time series data for the variables employed. The data on the variables covered 1983 to 2019. The data was obtained from Central Bank of Nigeria Statistical Bulletin and World Development Indicators (WDI) Data base.

Bootstrap ARDL Cointegration Test

To examine if there is a long-run relationship between the dependent and the independent variables, cointegration tests are employed. This study determined the existence of long run relationship between financial inclusion and economic growth by employing bootstrap ARDL cointegration approach. Bootstrap ARDL method was introduced by Mcknown *et al.,* (2018). This test is known to have advantages over Pesaran *et al*. (2001)'s ARDL bounds testing approach.

Thus, following McNown *et al*. (2018), the Bootstrapping-ARDL bounds testing procedure for the model of financial inclusion on economic growth was specified as follows:

$$\begin{aligned}\Delta lnGDP_t = \beta_0 &+ \sum_{i=1}^{p} \beta_{1i}\, \Delta lnGDP_{t-i} + \sum_{j=0}^{q} \beta_{2i}\, \Delta FII_{t-i} + \sum_{k=0}^{r} \beta_{3i}\, \Delta lnLRATE_{t-i} \\ &+ \sum_{l=0}^{s} \beta_{4i}\, \Delta lnDRATE_{t-i} + \sum_{m=0}^{t} \beta_5\, lnGFCF_{5i} + \alpha_1 lnGDP_{t-1}\, \alpha_2 FII_{t-1} \\ &+ \alpha_3 lnLRATE_{t-1} + \alpha_4 lnDRATE_{t-1} + \alpha_4 lnGFCF_{t-1} + \varepsilon_{1t} \end{aligned} \quad (2)$$

Error Correction Model (ECM)

After establishing long run relationship among the variables, and estimating the long-run parameters of the ARDL models, the short-run parameters were obtained by an error correction model (ECM). The error correction model is specified as follows:

$$\Delta lnGDP_t = \beta_0 + \sum_{i=1}^{p} \beta_{1i}\, \Delta lnGDP_{t-i} + \sum_{i=0}^{q} \beta_{2i}\, \Delta FII_{t-i} + \sum_{i=0}^{r} \beta_{3i}\, \Delta lnLTRATE_{t-i} + \sum_{i=0}^{s} \beta_{4i}\, \Delta lnDRATE_{t-i} + \sum_{k=0}^{t} \beta_4\, lnGFCF_4 + \theta_1 ECT_{t-1} + \varepsilon_{1t} \quad (3)$$

Cointegration among the variables exists when the bootstrap *F*-statistics is greater than the bootstrap critical value at chosen level of statistical significance. This can also be confirmed by the probability value of the bootstrap *F*-statistics. The hypothesis of no long run relationship is rejected if the bootstrap probability value is significant.

Results and discussion

This section presents the results and discussions of the analyses conducted on the data generated.

1. Results of the Unit Root Tests

The study conducted unit root test using Augmented Dickey- Fuller (ADF) and Phillips-Perron (PP) unit root tests, and the results revealed a mixed order of integration of the series employed. Therefore, taking into account the nature of the variables (that is a mixture of I (0) and I (1)), there is a solid justification for the application of ARDL model. The results of the unitroot tests is presented in table 1.

Table 1: Unit Root Tests Results

	ADF		PP		
Variables	**Level**	**First difference**	**Level**	**First difference**	**Stationarity Status**
LGDP	-1.3975	-4.2564 **	-2.7856	-13.3646***	I(1)
LRDL	-3.5125*	_____	-3.3461*	_____	I(0)
LRDD	-2.4568	-6.6453***	-2.3816	-6.7508***	I(1)
LBBSP	-1.6702	-4.8757***	-1.8086	-4.7973***	I(1)
LDLSE	-1.8969	-6.3190***	-2.0454	-6.3230***	I(1)
LRATE	-4.1763	-3.6369**	-2.4440	-6.8759***	I(1)
DRATE	-4.0817**	_____	-3.2392*	_____	I(0)
FII	-2.5147	-5.0870***	-2.5528	-6.5809***	I(1)
LGFCF	-3.6209**	_____	-6.850113	_____	I(0)

Notes: ***, ** and * denote significance at 1%, 5% and 10%, respectively. L denotes logarithm and lag length are selected based on SIC.
Source: Researcher's computation, (2024).

2. Results of Bootstrap ARDL test for Cointegration

This study used Bootstrap ARDL approach to cointegration in order to check for the existence of long-run relationship between financial inclusion and economic growth in Nigeria. The result is presented in table 2.

Table 2: Bootstrap ARDL test for Cointegration

Dependent variable| Independent variables	**Lag Specification**	**F-stat.**	**Critical values**			**P-Value**	**Cointegration Status**
			1%	**5%**	**10%**		
$(lnGDP\|FII, GFCF$	(1, 0, 1)	5.620	5.431	4.272	3.399	0.009	Cointegration
$(lnGDP\|\ lnRDL, lnRDD,\ lnBBSP, lnDLSE)$	(1, 1, 1, 0, 0)	6.047	5.431	4.272	3.399	0.007	Cointegration

Note: F-stat. is the Bootstrap test statistics, critical values are the bootstrap tabulated value and p-value is the Bootstrap probability value.
Source: Author's computation, (2024.)

The results in table 2 above shows the cointegration status between financial inclusion and economic growth in the model. The result indicated the existence of cointegration relationship between real GDP as dependent variable and Financial Inclusion Index (FII) as independent variable under the aggregated model. This is because, the Bootstrap F-statistics (5.620) is greater than the bootstrap critical value (4.272) at 5% level of significance. This is further confirmed by the bootstrap probability value (0.009) which is statistically significant at 5% significance level. Therefore, this finding satisfied the expectation of this study under its second objective which aims to determine whether or not a long run relationship exists between financial inclusion and economic growth.

3. Impact of Financial Inclusion on Economic Growth

The results of the long-run and short-run estimated coefficients of the aggregated impact of financial inclusion on economic growth in Nigeria are reported in panel A and panel B respectively in Table 3.

Table 3: Estimated Coefficients of the Long-run and Short-run

Panel A: Long-run Coefficients - Dependent variable is RGDP				
Regressor	Coefficient	Standard Error	t-Statistic	Prob.
FII	0.1727	0.0538	3.2068	0.0033
DRATE	-0.0603	0.0341	-1.7652	0.0884
LRATE	0.0592	0.0269	2.2024	0.0360
LGFCF	0.5905	0.4880	1.2101	0.2364
Panel B: Short-run Coefficients - Dependent variable is ΔRGDP				
C	3.6927	0.4921	7.5036	0.0000
FII **	0.0742	0.0333	2.2289	0.0340
DRATE***	-0.0259	0.0142	1.8239	0.0788
LRATE**	0.0255	0.0113	2.2575	0.0320
LGFCF	0.2538	0.2109	1.2036	0.2388

ECT_{t-1}	-0.4298	0.0577	-7.4433	0.0000
R^2	0.72663			
F-stat.	5.9115			0.0001
D.W-stat.	1.8203			

Notes: *, ** and *** denote significance at 1%, 5% and 10%, respectively and L denotes logarithm.
Source: Researcher's computation, (2024).

The results as presented in table 3, implies that, the marginal impact of financial inclusion remains 3.69% approximately. From the long-run estimates, the result reveals that, holding other factors constant, financial inclusion has a positive and significant impact on economic growth in Nigeria in the long-run. Specifically, a 1% increase in financial inclusion leads to about 0.173% increase in GDP in Nigeria. Therefore, financial inclusion represented in this study by the index promotes economic growth in Nigeria.

Moreover, from the short run results, the coefficient of the error correction term lagged by one period (ECT_{t-1}) is less than one, negative and statistically significant at 1% (-0.4298); P-Value (0.0000), therefore, meets the Apriori expectation. This result demonstrates that, 42.98% of any deviations from the equilibrium in the short run will be corrected in the long run within one quarter.

The result also reveals that, jointly, the independent variables in the models have adequately explained the variations in the dependent variable (LGDP) in Nigeria. This is indicated by the high R-square (0.72663) which implies that, 72.66% of the variations in LGDP, over the period (1983 to 2019), have been explained by financial inclusion. This also signifies that, less than 27% of the total variation in the dependent variable was explained by other variables not included in the model (error terms).

The value of F-statistics from this model is (5.91) approximately with a P-value (0.0001). This implies that, the financial inclusion variables used in the index are jointly significant in determining variation in GDP.

4. Results of Residual Diagnostic Tests

In order to establish and confirm the reliability of the estimated model, this study conducted the conventional residual diagnostic tests to validate the results generated. The Jarque- Bera normality test, Breusch-Godfrey serial correlation LM test, Breusch- Pegan Godfrey heteroscedasticity test, and Ramsey RESET (functional form) tests were conducted. The results of diagnostic test are presented in Table 4.

Table 4: Model Diagnostic Tests

Test Statistic	Results
Normality: Jarque-Bera	79.3614 [0.000]
Serial Correlation, Prob. F(2,75)	0.2678[0.7671]
Heteroscedasticity, Prob.F(22,77)	0.0002[0.9875]
Functional Form: Reset: Reset F-stat (1,24)	25.2467[0.142]

Source: Author`s computations, (2024).

Table 4 reveals that, the probability value of Jaque-Bera is statistically significant. Thus, we reject the null hypothesis of normally distributed residuals and the conclusion is that, the residuals are not normally distributed. Similarly, the value of the F-statistic in Breusch-Godfrey serial correlation LM test is not statistically significant, and hence, the null hypothesis of no serial correlation cannot be rejected. In addition, Breusch-Pagan-Godfrey Heteroscedasticity test result indicates that the value of the F-statistic is not statistically significant and hence, the spread of the residuals is Homoscedastic. Lastly, the result also proved that there is no omitted variable bias, because, the value the F-statistic of the Ramsey reset test is not statistically significant, hence, we cannot reject the null hypothesis of no omitted variable bias. Therefore, the model has passed all diagnostic tests with exception of normality.

Conclusion and recommendations

This study examined financial inclusion and economic growth nexus in Nigeria by constructing a multi-variable financial inclusion index regressed against economic growth. As expected, the findings from the regression analysis revealed that, financial inclusion has a strong positive and significant impact on economic growth in Nigeria. Therefore, in line with the findings from the study and the methodology employed, this study reiterates the positive effect of financial inclusion in the growth process as being debated in literature across the globe. The study also concludes that non-availability of banking and other financial services, non-accessibility of banking and other financial services and underutilization of banking/financial services in Nigeria immensely distort the growth process of Nigerian economy. Thus, the researcher attributes the dwindling growth of Nigerian economy partly to the challenges of financial inclusion.

The study in line with its findings, recommends that, Government through the Central Bank of Nigeria should come up with policies aimed at reducing the exorbitant interest rate and other exploitative hidden charges which low income rural dwellers could not possibly afford while transacting with rural deposit financial institutions (RDFIs).

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