

Financial Inclusion and Inclusive Growth in Nigeria: Evidence from Banking, Insurance and Stock Market.

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Abstract

The study examines the effect of financial inclusion on inclusive growth in Nigeria. The study employs market capitalization per head, insurance asset per head and deposit money bank account per head as measure of financial inclusion while inclusive growth was measure by economic growth, health, education and governance index. The study employs secondary data which were gathered from World Bank Data indicator and Central Bank of Nigeria Statistical Bulletin. The study adopts dynamic model to examine the effect of long run relationship between the financial inclusion and inclusive growth in Nigeria. The study found that the depth of financial inclusive is shallow on inclusive growth in Nigeria. The study concluded that there is a link between financial inclusion and inclusive growth in the area of educational standard and governance quality. The study recommends that government and policymakers should implement flexible policy that will widen the accessibility of financial services particularly in the area of banking, insurance and stock market to enhance inclusive growth most especially in the area of economic growth and health service improvement. The study therefore suggests that other studies should focus on the effect of financial exclusion on inclusive growth in Nigeria.

Keywords: Financial inclusion, inclusive growth, Education, Economic growth, Health, Governance

1.0 Introduction

It is a common phenomenon around the globe now that Central banks worldwide are being recognized as agents of development financing this because Central bank policies have included policies directed at financial sector development, the promotion of financial inclusion and aligning the financial system with sustainable development. This marks a shift from the orthodox approach to central banking. In the light of this, development finance therefore, involves provision of finance to support economic activities in various sectors of an economy with a view to improving financial and social conditions thus making growth more inclusive. It is a leveraging mechanism that facilitates the enhanced flow of credit and other financial services to the needy sectors of the economy and segments of the population to improve livelihood and contribute to national development (

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Dada, 2015). This is consonance with the view of Dori, (2016) who stressed that development finance encompasses the ideology, philosophy, objectives goals, strategies, schemes, programmes, institutional policy and economic or financial agents or agencies that provide, facilitate and enhance the provisions or supply of finance and credit for productive and economic activities to sectors such as agricultural industrial , manufacturing and entrepreneurial activities that can assist in achieving accelerating , improving and facilitating economic growth and developments.

Development finance initiatives in Nigeria can be dated back to 1960s and some of the initiatives used are Micro, Small and Medium Enterprises Development Fund (MSMEDF), national financial inclusion strategy and national infrastructure finance policy. Thus, with emphasis on financial inclusion, Mbutor and Uba, (2013) are of the opinion that financial inclusion enables access to financial resources and service for different economic agents at an affordable cost, especially to those with lower income. It could also be said to be the delivery of financial services at affordable costs to the unbanked and low-income segments of society. It is the opposite of financial exclusion where those services are neither available nor affordable to certain category of economic agents particularly the low-income members of the society (Umaru, 2014). In line with the CBN's drive to reduce financial exclusion, the National Financial inclusion strategy was launched on the 23rd of October, 2012. It aims at reducing the financial exclusion rate to 20.0 per cent by 2020. To facilitate the exercise, a Financial Inclusion Secretariat has been set up at the CBN. A number of initiatives have been implemented since the Programme was launched, including agent banking, cashless policy, financial literacy, consumer protection, geo spatial mapping of financial service access point, mobile payment services, Tiered Know Your Customer Requirement, among others. These have resulted in the reduction in adult financial exclusion rate from 46.3 per cent in 2010 to 39.7 per cent in 2012 (CBN, 2015). National Financial Inclusion Strategy launched by CBN in 2012, specified that in achieving financial inclusion adults must have easy access to a broad range of financial products designed according to their needs and provided at affordable costs. These products include payments, savings, credit, insurance and pensions.

Aside from all this strategy put in place, the financial inclusion has arisen the interest of many researchers and many studies have been documented on it but still findings are inconclusive. Thus, this study examines the effect of financial inclusion on inclusive growth in Nigeria. The study holistically examines financial inclusion from the perspective of banking sector inclusive, insurance sector inclusive and stock market inclusive and their effects on inclusive growth in Nigeria. These are the major aspect of financial sector in Nigeria which has contributed immensely to financial inclusion through their variety of product which could promote economic growth. Based on this, the study examines effects of financial inclusion on inclusive growth in Nigeria. In line with this objective, the hypothesis is stated at null form as financial inclusion has no significant effect on inclusive growth in Nigeria. To test the hypothesis, the study is sectioned in to the following; section two details the literature review, section three reveals the methodology, section four document the result of the analysis and section five proffers the conclusion.

2.0 Literature Review

Ramos, Ranieri and Lammens (2013) are of the opinion that inclusive growth is more important than economic growth because it considers the poverty level, inequality reduction and increased economic participation. It involves increasing access to basic healthcare, education and other social infrastructure that may impact the quality of human capital. Further, growth must foster equity among various groups in society. People from all genders, sexual orientation,

religion and ethnic background should be able to contribute to and benefit from economic growth (Huang & Quibria, 2013). On the other hand, financial inclusion is the availability of financial services, its range and quality to individuals who are underserved and financially excluded (World Bank (2012). Enhancing Financial Innovation and Access (EFInA) (2013) conceptualized financial inclusion as provision of a broad range of financial products (credit, insurance savings, payments, pensions, etc) relevant and affordable for the adult population, mostly the low-income earners. Centre for Financial Inclusion (CFI) (2013) expressed financial inclusion as a situation in which persons who can use financial services have access to it at affordable prices, in a manner convenient for them.

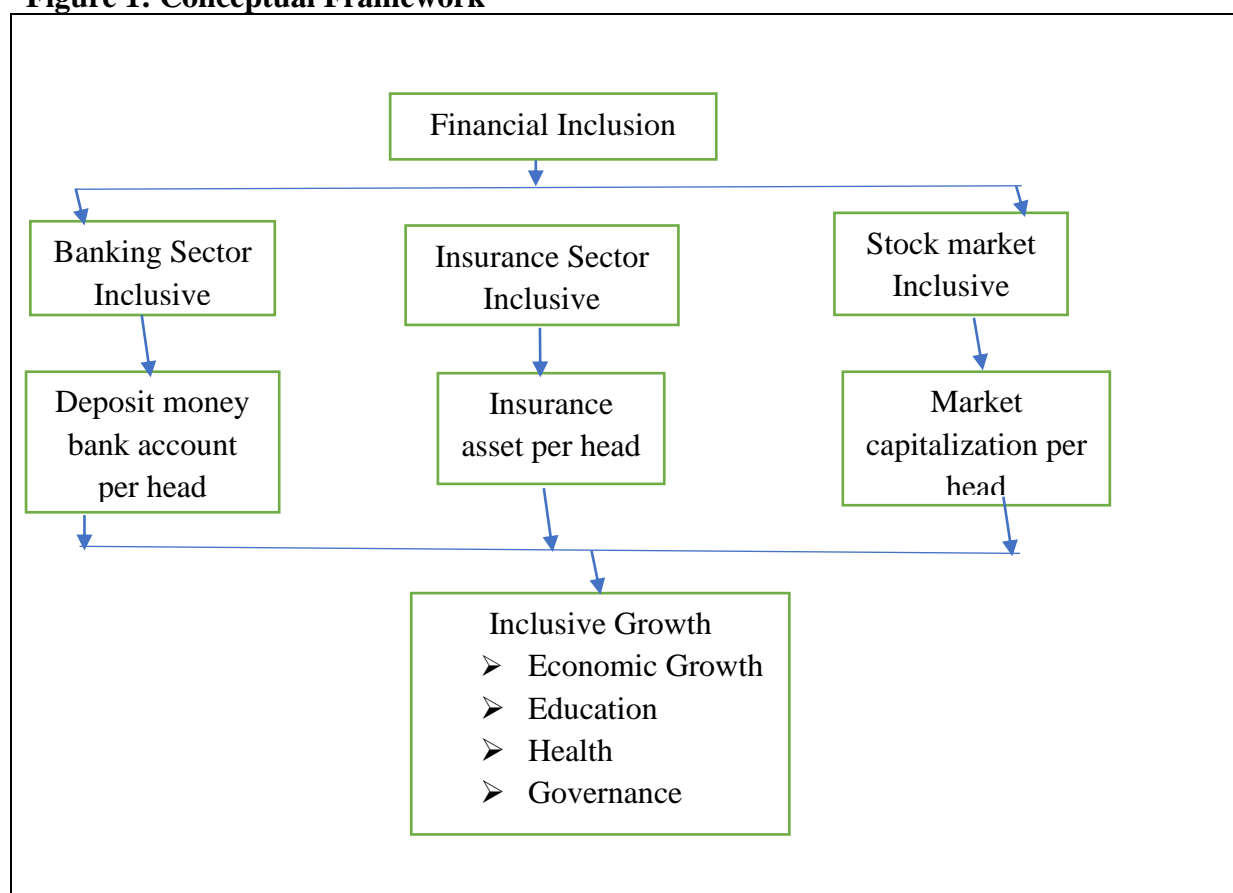
In spite of this, vast number of studies has been conducted on financial inclusion which is one of the development finance initiatives, such as Singh and Kodan (2011), explored the factors that significantly affect the financial inclusion in India. The study found that financial inclusion index is positively and significantly convergent to development (HDI) and financial inclusion is significantly influenced by per capital NSDP or economic development of the nation but not employment rate. Hariharan and Marktanner (2012) concluded that financial inclusion has the potential to enhance economic growth and development. They found a strong positive correlation between a country's financial inclusion and total factor productivity (TFP), implying that financial inclusion possesses the ability to create capital. The study concluded that financial inclusion has the potential to increase the financial sector savings portfolio, enhance efficiency of intermediation, and boost entrepreneurial activities which ultimately results in economic growth. Aduda and Kalunda (2012) concluded that household's access to finance has a strong positive relationship with growth. It further found that the relationship between depth and growth is bell shaped, suggesting that the returns to growth falls with higher depth beyond a certain point. However, financial institution access (FIA), an index of the density of ATMs and bank branches that narrowly defines inclusion, had a monotonic relationship with growth. In the same token, Mbutor and Uba, (2013) document that financial inclusion is imperative for economy growth process because as more people are brought into the formal financial system, proper planning and decision making will be enhanced. However, Joseph and Varghese (2014) conducted a study role of financial inclusion in the development of Indian economy and found that quite a number of people are still excluded from financial services even after the introduction of inclusive banking initiatives in the country. Piñeyro (2013) has studied the level of financial inclusion in 32 states of Mexico and its Municipality. Using principal component analysis, he found that around 36 percent of Municipality are financial inclusive whereas 29 percent of them are still excluded. He also found a direct relationship between education and financial inclusion and to some extent the high correlation between poverty and financial inclusion. Thus, he suggested that in order to benefit a large mass of excluded population, Mexican government should encourage equitable growth and equal opportunities

Also, Zulfiqar, Chaudhary and Aslam (2016) examined the state of financial inclusion and its significance for inclusive growth in Pakistan. he results suggest that lack of money and requisite formalities are significant barriers to access financial services. It emphasizes comprehensive & easy financial access to all segments of society to promote and enhance sustainable inclusive economic growth to benefit all. Williams, Adegoke, and Dare (2017) investigated the role of financial inclusion in poverty reduction and economic growth in a developing economy and concluded that concluded that most of the ATM in developing economy is obsolete and required a technological upgrade to have a significant impact in rural areas. Yin, Xu, Chen, and Peng (2019) analyzed the relationship between financial inclusion and circumstances monetary policy and economic fundamentals, which has a practical

reference value for policy makers. The study found that monetary policy has a short-term positive impact on financial inclusion factors, while the economic fundamental has the opposite, which means that the positive monetary policy promotes the development of financial inclusion in the short term and the sudden change of the economic situation will make it harder. The study concluded that sustainable development of financial inclusion needs appropriate coordination and mutual facilitation of economic fundamentals and finance is conducive to the sustainable development of financial inclusion. Sarpong and Nketiah-Amponsah (2022) empirically examined the quantitative relationship between financial inclusion and inclusive growth in sub-Saharan Africa using a panel of 46 countries for the period 2004–2018. The methodology employed is Arellano–Bover/Blundell–Bond system Generalized Method of Moment estimator. It was found that usage of financial services, among other covariates, has a quantifiable and discernible impact on inclusive growth compared with availability and knowledge of financial services. Also, Obi (2022) examined effect of financial inclusion on economic growth in Nigeria. Ordinary Least Square technique was adopted for data estimation. It was found that there is financial inclusion positively affects economic growth. It was concluded that financial inclusion is a growth driver.

Thus, consensus has not been reached on effect of financial inclusion on economic inclusive growth. Based on these findings, this study charts a different path as it will beams a searchlight on core aspect of inclusive growth such as economic growth, health, education and governance index to really produce in-depth analysis. Also, the financial inclusion was measured from the three major financial sector of the economy which are banking, insurance and stock market. This makes the study different from the previous studies. In view of this, the study presents the conceptual framework in the Figure 1.

Figure 1: Conceptual Framework



Source: Authors' Design, (2022)

3.1 Methodology

Expos-facto research design is adopted and it considered appropriate because selection and observation of existing variables are done without any manipulation of existing conditions. The population of the data is infinite but the study used purposive to choose the variables of interest with seemingly presumed linear property over finite time dimension. The study used market capitalization per head to capture stock market inclusive, insurance asset per head used to measure insurance sector inclusive and deposit money bank account per head was used to proxy banking sector inclusive while inclusive growth was measure by economic growth, health, education and governance index. Given the nature of this study, four models were constructed to achieve the set objectives of evaluating the effect financial inclusion on inclusive growth in Nigeria. To achieve the first and second objectives, the study used Toda and Yamamoto VAR approach. The reason for this is because the variables of interest are integrated at (1) and (2).

$$FI_t = \omega + \sum_{i=1}^m \theta_i FI_{t-i} + \sum_{i=m+1}^{m+d \max} \theta_i FI_{t-i} + \sum_{i=1}^m \delta_i GR_{t-i} + \sum_{i=m+1}^{m+d \max} \delta_i GR_{t-i} + v_1 \dots \dots \dots 1a$$

$$GR_t = \psi + \sum_{i=1}^m \phi_i GR_{t-i} + \sum_{i=m+1}^{m+d \max} \phi_i GR_{t-i} + \sum_{i=1}^m \beta_i FI_{t-i} + \sum_{i=m+1}^{m+d \max} \beta_i FI_{t-i} + v_2 \dots \dots \dots 1b$$

$$FI_t = \omega + \sum_{i=1}^m \theta_i FI_{t-i} + \sum_{i=m+1}^{m+d \max} \theta_i FI_{t-i} + \sum_{i=1}^m \delta_i HEA_{t-i} + \sum_{i=m+1}^{m+d \max} \delta_i HEA_{t-i} + v_1 \dots \dots \dots 2a$$

$$HEA_t = \psi + \sum_{i=1}^m \phi_i HEA_{t-i} + \sum_{i=m+1}^{m+d \max} \phi_i HEA_{t-i} + \sum_{i=1}^m \beta_i FI_{t-i} + \sum_{i=m+1}^{m+d \max} \beta_i FI_{t-i} + v_2 \dots \dots \dots 2b$$

Where: FI represents market capitalization per head, insurance asset per head and deposit money bank account per head while GR is the logarithm of economic growth and HEA is the logarithm of health.

To test the third hypothesis, the vector error correction model was employed because the all variables of interest are integrated at first difference. The model is specified in equation 3.

$$\Delta^{ko} LEDU_t = \Theta_o + \sum_{i=1}^n \Theta_1 (\Delta^{k1} LDPH_{t-i}) + \sum_{i=1}^n \Theta_2 (\Delta^{k2} LINPH_{t-i}) + \sum_{i=1}^n \Theta_3 (\Delta^{k3} LMPH_{t-i}) + \sum_{i=1}^n \Theta_4 (ECM_{t-i}) + \mu_t \dots 3$$

To test the fourth hypothesis, the autoregressive distributed lag (ARDL) model was adopted because the variables of interest were mixed integrated at order of one and zero i.e. I(0) and I(1). The model is specified in equation 4.

$$LGOV_t = b_0 + \sum_{i=1}^{q^1} b_i LGOV_{t-i} + \sum_{i=1}^{q^2} h_i LDPH_{t-i} + \sum_{i=1}^{q^3} g_i LINP_{t-i} + \sum_{i=1}^{q^4} f_i LMPH_{t-i} + w_t \dots \dots \dots 4$$

Where: LEDU represent logarithm of educational index, LGOV represent logarithm of governance index, LDPH represents logarithm of deposit money bank account per head, LINP represents logarithms of insurance asset per head, LMPH represents logarithm of market capitalization per head, q is the lag length, Δ represents difference operator, Θ_i represents parameters to be estimated, $t-i$ represents unknown lags to be estimated, ECM represents the error correction mechanism and μ_t represents the error term. The use of natural logarithm, rather than levels and percentage changes, mitigates correlations among the variables. Also, it helps in reducing heteroscedasticity as it compresses the scale in which variables are being measured Kuwornu (2012).

3.2 Data

The data were gathered from the Central Bank of Nigeria Statistical bulletin and World Bank Data Indicator. The data were gathered for the period of 36 years spanning from 1981 to 2018. In estimating the models and achievement of the research objectives, the data are subjected to

series of test such as lag selection criteria, unit root test, and correlation test among others. In addition, the Table 3.1 shows the measurement of variables

Table 1: variable definition and Measurement

S/N	Variables	Proxy	Measurement	Source
1	Inclusive Growth	1) Economic Growth	GDP per capital growth rate	WDI (2018)
		2) Education	Primary school enrolment	WDI (2018)
		3) Health	Mortality rate under-5	WDI (2018)
		4)Governance	Government effectiveness	WDI (2018)
2	Financial Inclusion	1) Banking inclusive	Density which is measure as deposit money bank account per head	Swiss-Re (2016)
		2) Insurance Inclusive	Density which is measure as insurance asset per head	Swiss-Re (2016)
		3) Stock market Inclusive	Density which is measure by market capitalization per head.	Swiss-Re (2016)

Source: Author's Compilation, (2022)

4.0 Result

This section presents the results from the estimation of the model, the interpretation and discussion of the result in line with previous studies. The study starts with descriptive statistic which comprise of the mean, median, maximum, minimum, standard deviation, skewness, kurtosis and Jarque-bera. The result of the descriptive is presented in the Table 2.

Table 2: Descriptive Statistics

	DPH	EDU	EGR	GOV	HEA	INPH	MPH
Mean	26766.98	94.08785	0.544901	9.274032	174.5243	1608.139	28331.58
Median	4865.190	93.45372	1.553724	8.333533	191.5000	461.8000	3220.580
Maximum	97391.80	113.0465	12.45747	32.84314	212.0000	4694.500	111025.0
Minimum	141.4486	78.61452	-15.45037	-1.214644	100.2000	176.8000	64.53870

Std. Dev.	36293.01	8.817659	5.394160	9.310911	39.37887	1754.186	37819.26
Skewness	1.008197	0.575285	-0.877883	0.671428	-0.606343	0.743411	0.911648
Kurtosis	2.320811	2.695541	4.604779	2.468789	1.815175	1.740011	2.149283
Jarque-Bera	7.167978	1.947699	8.958545	9.905871	4.431392	6.013830	6.409532
Probability	0.027765	0.377627	0.011342	0.007063	0.109078	0.049444	0.040568

Source: Authors' computation, (2022)

The Table shows the summary of the variables of interest. Looking at the mean of the variables, it can be observed that they are all positive throughout the sampling period and this denotes that variables have increasing tendency throughout the period of investigation. The result also shows that economic growth has the lowest volatility while market capitalisation per her head has the highest volatility. Also, the scores of skewness shows that economic growth and health are negatively skewed while other variables are positively skewed. The scale of kurtosis indicates that the variables have values lesser than 3 and this means they are platykurtic in nature. The implication of this is that these variables do not have tin tail in their distribution pattern and it reveals absence of outliers or larger values. The Jarque-bera shows that only education and health are normally distributed while other variables are not normally distributed. This is because the associated probability value of the Jarque-bera in respect of education is larger than 5 per cent and the probability values associated with Jarque-bera in respect of other variables are lesser than 5 per cent. Having described the data, the study proceeds to test the stationarity of the variables and the result of the test is reported below.

Table.3-Test of Unit Root Based on PP Mechanism

Variable	PP-stat	5% critical value	P-value
LOGINPH	-0.084627	-2.943427	0.9438
D(LOGINPH)	-3.445811	-2.945842	0.0157
LOGDPH	-0.744281	-2.943427	0.8228
D(LOGDPH)	-3.408052	-2.945842	0.0172
LOGMPH	-0.818049	-2.943427	0.8022
D(LOGMPH)	-4.363849	-2.945842	0.0014
LOGHEA	-2.945842	3.320506	1.0000
D(LOGHEA)	-0.604260	-2.948404	0.8570
D(LOGHEA,2)	-3.023961	-2.951125	0.0427
LOGEDU	-1.517408	-2.963972	0.5113
D(LOGEDU)	-3.412806	-2.971853	0.0190
LOGEGR	-0.457744	-3.052169	0.8774
D(LOGEGR)	-2.406044	-3.098896	0.1574
D(LOGEGR,2)	-7.796981	-3.144920	0.0000
LOGGOV	-32.36827	-2.900137	0.0001

Source: Author's Computation, (2022)

As shown in the Table 3, the variables of interest are stationary at various stages. Insurance asset per head, deposit money bank account per head, market capitalization per head and education variable are stationary at first difference since the absolute value of PP statistic is greater than the absolute value of 5 percent critical value. This is also confirmed by their associated probability values which are lesser than 5 percent. The health and economic growth

variables are stationary at second difference since the absolute value of PP statistic is greater than the absolute value of 5 percent critical value. This is also confirmed by their associated probability values which are lesser than 5 percent. The governance variable is stationary at level as shown by its absolute PP statistic value greater than its corresponding value at 5 percent. This reveals that the variables of interest are combination of both I(0), I(1) and I(2) variables. This is case of mixed integrations and the study applies different methods depending on the combination of order of integration between the dependent and independent variables.

4.1 Financial Inclusion-Economic growth Nexus

The relationship between financial inclusion and economic growth can be examined using Toda and Yamamoto VAR approach. The reason for the adoption of this method is that the variables of financial inclusion and economic growth are integrated at (1) and (2). In applying this method, the following are the necessary steps to be carried out; lag selection criterion, test of autocorrelation, model stability test, long run form and bond test, short run form and error correction form, and cointegration graph. All of these steps are followed to achieve the nexus between financial inclusion and economic growth. The result of lag selection criteria is presented in Table 4.

Table 4: Lag Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-9.853643	NA	7.46e-05	1.847152	2.035966	1.845141
1	45.07010	73.23166*	4.62e-07*	-3.342680*	-2.398614*	-3.352737*

Source: Authors' computation (2022)

The optimum lag for Toda and Yamamoto VAR model specified in the Table 4 is 1; implying that 1 is the optimum lag selected by most of the information criteria. Thus, the Toda and Yamamoto VAR framework approach are operationalized using lag 1 as the optimal lag. After determining the optimum lag, the study proceeds to test for the serial correlation of the residuals of the VAR. The classical assumption says that if the residuals are autocorrelated, the estimated parameters will be inconsistent and bias. The study conducts a test for the violation of this assumption on the model and the result is reported Table 5.

Table 5-Autocorrelation Test Financial Inclusion-Economic growth Nexus

Lag	LM-Stat	P-value
1	18.34237	0.3042
2	7.787299	0.9549
3	17.60953	0.3473
4	22.03284	0.1421

Source: Authors' Computation, (2022)

The test result shows that from lag 1 to 4, the p values associated with the LM-statistics are in each case greater than 5 percent alpha value, suggesting that hypothesis of no autocorrelation is not rejected. The model is appropriate based on the autocorrelation test. The residuals are independently spread. The test for ergodicity is carried out by computing the root of the AR polynomial and it is shown in the Figure 1 below for the model.

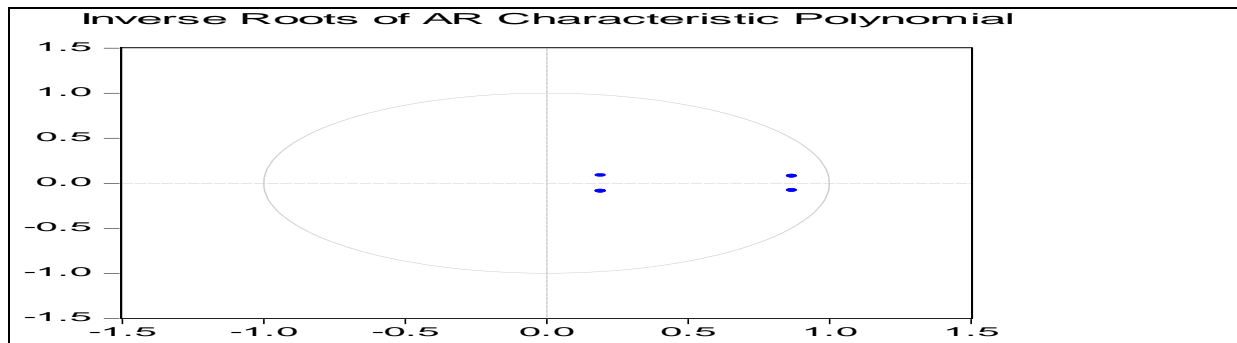


Figure 1: Ergodicity Test for Financial Inclusion-Economic growth Nexus

Source: Output from E-View

Since the polynomial roots rest or lie on the unit interval and this implies the model specified in the previous section is relatively stable. Thus, the study conducts cointegration test to establish the presence of long run relationship and the result is reported in Table 6.

Table 6: Cointegration Rank Test Result

Ho	H1	Eigen Value	λ_{\max} Test	λ_{\max} (0.05)	Trace Test	Trace (0.05)
$r = 0$	$r = 1$	0.636657	25.36615	12.98179	51.87294	41.85613
$r \leq 1$	$r = 2$	0.237165	13.98179	11.13162	16.50680	19.79707
$r \leq 2$	$r = 3$	0.154092	8.967220	12.26460	10.52501	13.49471
$r \leq 3$	$r = 4$	0.062469	1.557789	2.841466	2.557789	3.841466

Source: Authors' computation, (2022)

From the table, it is clear that there is existence of cointegration between the financial inclusion and economic growth. However, in conducting Toda and Yamamoto VAR model this is a necessary condition but not compulsory condition. Thus, this study proceeds to estimate the pairwise granger causality and the result is reported Table 7.

Table 7: Pairwise Granger Causality

Null Hypothesis	Chi-sq	Probability	Decision
LINPH does not granger cause LEGR	1.196442	0.2740	Accept
LEGR does not granger cause LINPH	1.786070	0.1814	Accept
LMPH does not granger cause LEGR	0.565686	0.4520	Accept
LEGR does not granger cause LMPH	0.257654	0.6117	Accept
LDPH does not granger cause LEGR	1.349984	0.2453	Accept
LEGR does not granger cause LEGR	2.908305	0.0881	Accept

Source: Authors' Computation, (2022)

The result shows that the insurance asset per head, market capitalization per head and deposit money bank account per head do not granger cause economic growth. This implies that there is no causal relationship between insurance asset per head, market capitalization per head and deposit money bank account per head and economic growth. This stresses that insurance asset per head, market capitalization per head and deposit money bank account per head cannot be used to predict the future economic growth in in Nigeria and also the economic growth in cannot be used to explain future behaviour of insurance asset per head, market capitalization per head and deposit money bank account per head.

4.2 Financial Inclusion-Health Nexus

The relationship between financial inclusion and health improvement can be examined using Toda and Yamamoto VAR approach. The reason for the adoption of this method is that the variables of financial inclusion and health are integrated at (1) and (2). In applying this method,

the following are the necessary steps to be carried out; lag selection criterion, test of autocorrelation, model stability test, long run form and bond test, short run form and error correction form, and cointegration graph. All of these steps are followed to achieve the nexus between financial inclusion and health. The result of lag selection criteria is presented in Table 8.

Table 8: Lag Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-44.46361	NA	0.000203	2.850801	3.030373	2.912040
1	218.3583	448.3433	1.01e-10	-11.66814	-10.77028	-11.36194
2	267.9546	72.93566*	1.47e-11*	-13.64439*	-12.02824*	-13.09323*
3	282.8662	18.42025	1.75e-11	-13.58036	-11.24593	-12.78426

Source: Authors' computation, (2022)

The optimum lag for Toda and Yamamoto VAR model specified in the Table 8 is 2; implying that 2 is the optimum lag selected by most of the information criteria. Thus, the Toda and Yamamoto VAR framework approach are operationalized using lag 2 as the optimal lag. After determining the optimum lag, the study proceeds to test for the serial correlation of the residuals of the VAR. The classical assumption says that if the residuals are autocorrelated, the estimated parameters will be inconsistent and bias. The study conducts a test for the violation of this assumption on the model and the result is reported Table 9.

Table 9-Autocorrelation Test for Financial inclusion-Health Nexus

Lag	LM-Stat	P-value
1	19.78719	0.2300
2	17.45586	0.3567
3	14.52349	0.5598
4	14.11342	0.5903

Source: Authors' Computation (2020)

The test result shows that from lag 1 to 4, the p values associated with the LM-statistics are in each case greater than 5 percent alpha value, suggesting that hypothesis of no autocorrelation is not rejected. The model is appropriate based on the autocorrelation test. In view of this, the null hypothesis of no serial correlation cannot be rejected. The residuals are independently spread. The test for ergodicity is carried out by computing the root of the AR polynomial and it is shown in the Figure 2 below for the model.

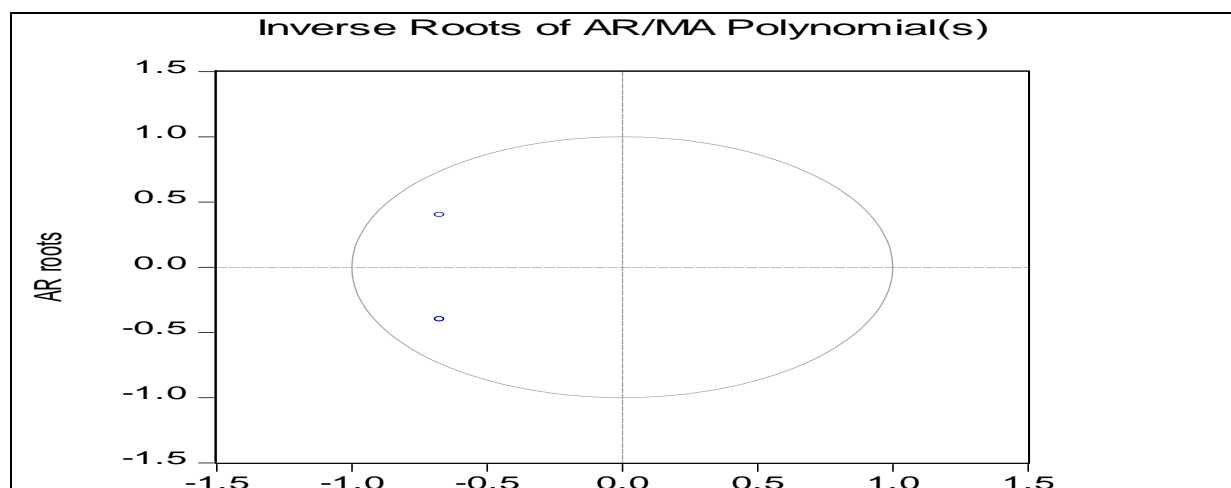


Figure 2: Ergodicity Test for Financial Inclusion-Health Nexus**Source: Output from E-View**

Evidence from Figure 2 reveals that the polynomial roots rest or lie on the unit interval and this implies the model specified in the previous section are relatively stable. Thus, the study conduct cointegration test among the variable to establish the presence of long run relationship and the result is reported in Table 4.10.

Table 10: Cointegration Rank Test Result

Ho	H1	Eigen Value	λ_{\max} Test	λ_{\max} (0.05)	Trace Test	Trace (0.05)
$r = 0$	$r = 1$	0.736657	45.36615	13.98179	71.87294	47.85613
$r \leq 1$	$r = 2$	0.337165	13.98179	21.13162	26.50680	29.79707
$r \leq 2$	$r = 3$	0.254092	9.967220	14.26460	12.52501	15.49471
$r \leq 3$	$r = 4$	0.072469	2.557789	3.841466	2.699789	3.841466

Source: Authors' computation, (2022)

The result shows that co-integrating relationship exists among the variables as this confirmed by both Max-Eigen statistic and trace statistics. In view of this, the study proceeds to estimate the granger causality test for the model and the result is reported in the Tale 11.

Table 11: Pairwise Granger Causality

Null Hypotheses	Chi-Square	Probability	Decision
LINP does not granger cause LHEA	6.212617	0.6448	Accept
LHEA does not granger cause LINP	0.977336	0.6134	Accept
LMPH does not granger cause LHEA	3.595749	0.1657	Accept
LHEA does not granger cause LMPH	2.610412	0.2711	Accept
LDPH does not granger cause LHEA	0.250251	0.8824	Accept
LHEA does not granger cause LDPH	1.098624	0.5773	Accept

Source: Authors' Computation, (2022)

The result shows that the insurance asset per head, market capitalization per head and deposit money bank account per head do not granger cause an improved health facility. This implies that there is no causal relationship between insurance asset per head, market capitalization per head and deposit money bank account per head and an improved health facility. This stresses that insurance asset per head, market capitalization per head and deposit money bank account per head cannot be used to predict the future an improved health facility in in Nigeria and also an improved health facility cannot be used to insurance asset per head, market capitalization per head and deposit money bank account per head.

4.3 Financial Inclusion-Education Nexus

The relationship between financial inclusion and education improvement can be examined using vector error correction model approach. The reason for the adoption of this method is that the variables of financial inclusion and education are integrated at (1). In applying this method, the following are the necessary steps; Lag selection criterion, cointegration test, long run form, short run form and error correction form. All of these steps are followed to achieve the nexus between the financial inclusion and education in Nigeria. The result of lag selection criteria is presented in Table 12.

Table 12: Lag Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
1	100.4218	230.8754*	2.47e-08*	-6.186296*	-5.218529*	-5.907614*

2	114.2550	18.08956	3.22e-08	-6.019618	-4.277639	-5.517991
3	131.1647	16.90968	3.95e-08	-6.089594	-3.573401	-5.365021

Source: Authors' Computation, (2022)

The optimum lag for vector error correction model specified in the Table 12 is 1; implying that 1 is the optimum lag selected by most of the information criteria. Thus, the vector error correction model framework approach is operationalized using lag 1 as the optimal lag. After determining the optimum lag, the study proceed to estimate the cointegration test and the result is reported in the Table 13.

Table 13: Cointegration Rank Test Result

Ho	H1	Eigen Value	λ_{\max} Test	λ_{\max} (0.05)	Trace Test	Trace (0.05)
$r = 0$	$r = 1$	0.449598	19.70451	21.13162	32.57533	29.79707
$r \leq 1$	$r = 2$	0.318148	12.63709	14.26460	12.87082	15.49471
$r \leq 2$	$r = 3$	0.007058	0.233730	3.841466	0.233730	3.841466

Source: Authors' Computation, (2022)

The result shows co-integrating relationship exists among the variables could not rejected. This is confirmed by both the Max-Eigen and trace statistic. Based on this evidence of the cointegration, the study proceeds to examine the nature of the long run relationship among the variables and the result is presented below.

Table 14: Nature of Long-run Relationship between Financial Inclusion and Education

Regressor	Coefficient	St-error	T-statistic	P-Value
LINPH(-1)	0.142159	(0.05005)	[2.84028]	0.00766
LMPH(-1)	0.033750	(0.08661)	[0.38967]	0.69933
LDPH(-1)	-0.102398	(0.08914)	[-1.14877]	0.25922

Source: Authors' computation, (2022)

The coefficients of the regressors in table above shows that insurance per head has positive and significant effect on education in the long run, market capitalisation has positive but insignificant effect on education in the long run. Also deposit per head has a negative and insignificant effect on education in the long run. The disequilibrium in the long run must be corrected otherwise, long run relationship does not exist. The correction mechanism is referred to error correction model (ECM). The study estimates the ECM coefficient along with short run dynamic coefficients, and the values of these coefficients are presented in Table 15.

Table 15: Nature of Short run Dynamism between Financial Inclusion and Education

Variables	Coefficients	Standard Dev	T-Stat	P-value
ECM	-0.544908	(0.13802)	[-3.94818]	0.00039
D(LEDU(-1))	0.260655	(0.19171)	[1.35962]	0.18336
D(LEDU(-2))	0.679381	(0.23817)	[2.85255]	0.00744
D(LINPH(-1))	0.243576	(0.09165)	[2.65765]	0.01226
D(LINPH(-2))	0.108277	(0.09588)	[1.12935]	0.27929
D(LMPH(-1))	-0.132243	(0.03309)	[-3.99666]	0.00044
D(LMPH(-2))	-0.019746	(0.03736)	[-0.52853]	0.60103
D(LDPH(-1))	-0.129239	(0.07339)	[-1.76102]	0.08750

D(LDPH(-2)) -0.080830 (0.07872) [-1.02684] 0.31235

Source: Authors' computation, (2022)

The dynamic coefficient of education at lag 1 is positive but insignificant while at lag 2, the coefficients positive and significant. This means an improvement in previous educational standard could facilitate improvement in current educational standard in the short run. Also, the result shows that an increase in previous both at lag 1 and 2, an insurance per head as a source of financial inclusion could influence current educational standard positively. In a different token, the result reveals that a decrease in market capitalisation per head and deposit per head both at lag 1 and 2 influence the educational standard negatively. The ECM coefficient is negative -0.54, suggesting that any disequilibrium can be corrected at the speed or rate of 54 percent within a year. In view of this, there is long run dynamic causality or influence running from financial inclusion to educational standard in Nigeria.

4.4 Financial Inclusion-Governance Nexus

The relationship between financial inclusion and governance can be examined using ARDL approach. The reason for this method is informed from the result of unit root test conducted above because the variables are multi-levelled at both I(1) and I(0). The applicable method is the ARDL and Bond test approach to cointegration, which I apply in this study. The process of this application involves the followings-model selection, test of autocorrelation, model stability test, long run form and bond test, short run form and error correction form, and cointegration graph. All of these steps are followed to achieve the objectives set out for this study.

Table 16: Lag Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-24.92578	NA	0.000556	3.856771	4.045585	3.854760
1	36.86766	82.39126*	1.38e-06*	-2.249022*	-1.304955*	-2.259078*

Sourced: Authors' Computation, (2022)

In selecting the appropriate model, Autoregression Distributed Lag (ARDL) precisely 500 ARDL models are evaluated for the relationship between financial inclusion and governance, in which case the study presents the top 20 ARDL models below based on their information criteria. The Akaike Information Criteria (AIC) is adopted for the selection of the optimum ARDL model. The result is presented in Figure 3.

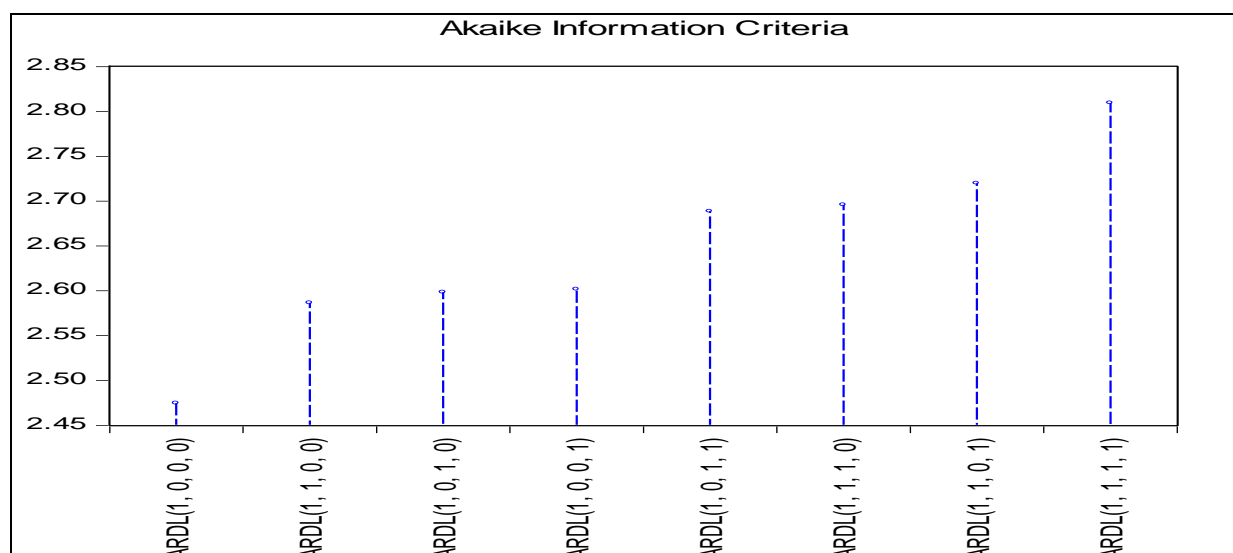


Figure 3: Optimum ARDL Model for Financial Inclusion-Governance Relationship

Source: Output from the E-view

The ARDL model with the lowest AIC value (almost approaching 2.50) among the top ARDL models is ARDL (1, 0, 0, 0). While the highest AIC is almost 2.85 corresponding to ARDL (1, 1, 1, 1). Thus, ARDL (1, 1, 1, 1) is the optimum ARDL model. In view of this, the classical assumption says that if the residuals are autocorrelated, the estimated parameters will be inconsistent and bias. The study conducts the autocorrelation to test if the ARDL (1, 1, 1, 1) violates the assumption of autocorrelation. The result was reported in Tables 18.

Table 18-Autocorrelation Test for ARDL (1, 1, 1, 1) Quoted for Financial Inclusion-Governance Nexus relationship

lag	AC	PAC	Q-Stat	Prob*
1	-0.690	-0.690	8.6632	0.083
2	0.357	-0.226	11.162	0.064
3	-0.217	-0.142	12.159	0.057
4	0.207	0.088	13.156	0.110
5	-0.480	-0.590	19.038	0.102

Source: Authors' computation, (2022)

Table 4.4 gives the coefficients of autocorrelation and partial autocorrelation with their corresponding Q statistics and probabilities up to lag 4. The p values are in every lag greater than 5 percent, meaning that the hypothesis of no autocorrelation cannot be rejected. The fitted ARDL (1, 1, 1, 1) for this study is free from autocorrelation. In view of this, the study proceeds to check the stability of the model and the result is reported below.

Table 19-Stability Test by Statistical Evidence ARDL (1, 1, 1, 1)

AR-Root	Modulus	Cycle
-0.151 ± 0.547	0.566786	3.417285

Source: Authors computation, (2022)

The modulus for ARDL (1, 1, 1, 1) is 0.57 and this purport that the modulus is less than unity. This implies that the model is stable or ergodic. The model is good specifications for cointegration test. The study proceeds to cointegration test by bound approach and the result of the cointegration is reported Table 20.

Table 20: -Bound Test Results on Financial Inclusion-Governance Nexus relationship

Test-stat	Value	Sig	I (0)	I (1)
			Asymptotic: n=1000	
F-statistic	13.26353	10%	2.37	3.2
k	3	5%	2.79	3.67
		2.5%	3.15	4.08
		1%	3.65	4.66
Actual Sample Size	33		Finite Sample: n=35	
		10%	2.618	3.532
		5%	3.164	4.194
		1%	4.428	5.816
			Finite Sample: n=30	
		10%	2.676	3.586
		5%	3.272	4.306
		1%	4.614	5.966

Source: Authors' computation, (2022).

As shown in the table the F statistic is 13.26353, the lower bound I (0) values at 5 percent for the asymptotic sample and finite sample are 2.79 and 3.164 respectively; while the upper bound I (1) at 5 percent for the asymptotic sample and finite sample are 3.67 and 4.194 respectively. It seems good that the F statistic 13.26353 exceeds the upper value in both sample sizes. Even in the less sample size where n=30, the F statistic still exceeds the upper value at 5 percent. This suggests that the null hypothesis that no level relationship is rejected at 5 percent level of significance. This investigation finds out that there is existence of cointegrating relationship between financial inclusion and governance. Thus, the study proceeds to examine the long-run multiplier effect between the financial inclusion and governance. The result is presented in the Table 21.

Table 21: Financial inclusion and Governance for Log Run Multiplier Effects

Regressors	Coefficient	Std-error	T-value	P-value
LINPH	-4.639897	3.272517	-1.417838	0.1866
LMPH	1.531943	1.197142	1.279667	0.2296
LDPH	1.892993	1.511459	1.252427	0.2389
C	2.450343	1.963567	1.247904	0.2405

Source: Authors' computation, (2022)

The result shows that insurance per head has a negative and insignificant long run multiplier effect on governance while the market capitalisation per head and deposit per head have positive but insignificant long run multiplier effect on governance. Based on this stylized fact, the study attempts to investigate the short run dynamic relationship between the covariates and explained variables. The result of the short run dynamics and the adjustment parameter is reported below.

Table 22: Financial inclusion and Governance-Treated for Short Run Dynamic Relationship and Adjustment Parameter

Regressors	Coefficient	Std-error	T-value	P-value
D(LINPH)	-4.084129	2.850587	-1.432733	0.1824
D(LMPH)	1.348447	1.041449	1.294779	0.2245
D(LDPH)	1.666250	1.326722	1.255915	0.2377
CointEq(-1)	-0.880220	0.113704	-7.741330	0.0000

Source: Authors' computation, (2022)

The result shows that insurance per head has a negative and insignificant short run dynamic influence on governance while the market capitalisation per head and deposit per head have positive but insignificant short run dynamic influence on governance. The study also reveals the adjustment parameter of -0.88 with the probability value of 0 percent. This implies two basic relationships; long run causality or influence runs from financial inclusion to governance and 88 percent disequilibrium is be corrected within a year. This suggests that 88 percent disequilibrium in governance is corrected/adjusted when insurance per head, market capitalisation and deposit per head jointly changes by 1percent.

4.5 Discussion

The result shows that the insurance asset per head, market capitalization per head and deposit money bank account per head do not granger cause economic growth. This implies that there is no causal relationship financial inclusion and economic growth. Thus, the impact of financial inclusion on economic growth is not felt on the economic growth in Nigeria. Despite the varieties of products introduced by the banks, insurance and stock market in making financial services available to rural dweller, the consequence was not felt on the Nigerian economic growth. The result shows that the insurance asset per head, market capitalization per head and deposit money bank account per head do not granger cause an improved health facility. This implies that there is no causal relationship between financial inclusion and an improved health facility and this does not conform to the findings of Karlan and Zinman (2010). More so, the study found that there is long run dynamic causality or influence running from financial inclusion through insurance inclusive to educational improvement in Nigeria and this is line with the findings of Piñeyro (2013), Adetunji (2017) among others. Furthermore, the study found that there exists long run causality or influence runs from financial inclusion to governance but the influence is not significant and this in consonance with the findings of Boateng (2017).

5.0 Conclusion

The study examines effect of financial inclusion on inclusive growth in Nigeria. The study adopts deposit per head, insurance per head and market capitalisation per head as proxy for financial inclusion while inclusive growth was measure by economic growth, health, education and governance index. The study concluded that there is a link between financial inclusion and inclusive growth in the area of educational standard and governance quality. The study recommend that government and policymakers should implement flexible policy that will widen the accessibility of financial services particularly in the area of banking, insurance and stock market to enhance inclusive growth most especially in the area of economic growth and health service improvement. Also, the deployment of enhanced mobile banking and internet services by financial institutes to improve access to bank accounts and other services as well as the active participation of educational institutes in furthering financial literacy. The study

therefore suggests that other studies should focus on the effect of financial exclusion on inclusive growth in Nigeria.

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