Global Scientific JOURNALS

GSJ: Volume 10, Issue 1, January 2022, Online: ISSN 2320-9186

www.globalscientificjournal.com

FINANCIAL INCLUSION AND ECONOMIC GROWTH IN NIGERIA: AN EMPIRICAL INVESTIGATION

BY

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Abstract

The paper investigates empirically the impact of financial inclusion on economic growth in Nigeria using quarterly time series covering theperiod 2009Q1 and 2020Q4. Data used were Real Gross Domestic Product (RGDP) as the dependent variable to capture economic growth and Number of Point of Sale (POS), Loans of Rural Branches of deposit money Banks (LRB), credit barrier (CRB) and deposit money Banks Loans to Small Scale Enterprises (LSE) to capture financial inclusion as the explanatory variables. Relying on descriptive statistics, unit root test and Toda-Yamamoto causality modeling techniques the data were analysed. The outcome of the analyses showed that POS, LRB, CRB and LSE do not affect the RGDP both jointly and individually at 5 percent level. The paper therefore concludes that financial inclusion has not enhanced economic growth in Nigeria within the period of study. The paper therefore recommends that government should create enabling environment for effective financial inclusion through structures and platforms such as bank branches and POS terminals of conventional banks as well as adequately equip them so as to enhance and sustain financial inclusion and by extension bringing those in the informal sector into the formal financial sector.

Keywords: *Financial Inclusion, Informal Sector and Economic Growth*

1. Introduction

Financial inclusion means the process of making financial products and services available and affordable and also creating equal opportunities for all individuals to access them through the formal financial system. Economic growth refers to an increase in the quantity of goods and

services an individual within a population can produce within a specific time frame, usually one year. Since the mid-twenties, financial inclusion has been a major focus of all levels of policy makers and researchers in both developed and developing economies. Financial exclusion has been identified as a cause of poverty and unemployment. (Hannig and Jansen 2020) noted that financial inclusion strives to engage the population which is excluded from the financial system to allow them to access financial products and services such as savings, payments, credit transfers and insurance.

Financial inclusion is an important tool for achieving macroeconomic stability in the economy and a veritable means of achieving sustainable economic growth (Omar and Inaba, 2020). Numerous empirical literatures exist which have established mixed results about the relationship between financial inclusion and economic growth using methods of analysis different from the present study. National financial inclusion targets can be set bt the use of financial inclusion indicators. The World Bank stated that policy makers can make use of reliable performance indicators and survey mechanism to achieve a lot such as diagnose the scale of financial inclusion, agree on targets, identify barriers, craft policies and monitor and measure policy impact. Therefore, there are four ways to measure financial inclusion using financial inclusion indicators namely access, usage, quality and an assessment of how financial inclusion impacts households and firm's outcomes such as firm level performance and human capital investment (World Bank, 2015). The outcome of this view of financial inclusion is latitude of definitions in economic literature today. Previous studies on the impact of financial inclusion on economic growth made use of ordinary least square regression model, Vector auto-regression (VAR) models and Granger casualty test for analyses (*See* Olaniyi; 2015, Sharma; 2015, Onaolapo; 2015, Abiola, Sulaiman and Migiro; 2018, Kamalu, Ibrahim, Ahmad and Mustapha; 2019). Therefore, theobjective of this paper is to analyze the impact of financial inclusion on economic growth in Nigeria. The paper is organized into five sections. First, is the introduction and followed by literature review. In the third and fourth sections, methodology, results and discussions were considered while five the conclusion and recommendations.

2. Literature Review

2.1 Review of Theoretical Literature

2.1.1 Public Good theory.

According to Ozili (2020), public good theory of financial inclusion opines that formal financial services delivery to the whole population as well as making sure that of unhindered access to finance for every member of the population should be seen and treated as a public good for the benefit and interest of the entire population.

This means that if the public goods theory approach is adopted, no member of the population will be discriminated against in gaining access to formal financial services and products or excluded from use of all financial services. This means the availability and equality of access by all individuals to all financial services and products without hindrance (Bhandari, 2018, and Allen, et al., 2016).

The theory advocates that every individual or business in the population is entitled to benefit from the practice of financial inclusion. The theory further encourages the government to provide certain services free of charge to all members of the population such as issuance of free debit cards, withdrawal forms, deposit slips as well as subsidize commission and costs of transactions. All these are to ensure that every member of the population is brought into the financial sector mainstream. To encourage people to participate in the scheme, advocates posit that as a way to ensure that everyone has a bank account, the government can lodge a lump sum into everyone's account so that owing an account will be a condition to withdraw and benefit from the fund deposited by the government. The foregoing shows that a lot of people will be financially included if the service is provided as a public good and at no cost to the beneficiaries. If viewed and provided as public good, many people stand to benefit from it irrespective of demographic differences-age, sex, religion, origin, income level and status. Also, if financial inclusion is approached as a public good it will be funded by government using public funds rather than private funding. Similarly, the public good theory affords the government the opportunity to see its role to the population as a social responsibility obligation. The public goods theory also recognizes the government as the major contributor to financial inclusion efforts rather than the private sector as a major engineer of financial inclusion. Conversely, it is very difficult to apply financial inclusion as a public good in emerging economics where financial institutions are mostly funded by private capital. Again, a notable disadvantage of the public good theory of financial inclusion is that it may become a conduit pipe to divert public funds instead of concentrating on core public projects for which public funds are meant.

Despite the inherent benefits of the public good theory, most economists posit that it does not put cost on beneficiaries. As a result, participates get it for free while government spends publics funds to their sole benefit.

2.1.2 Vulnerable Group Theory

The vulnerable group theory of financial inclusion programs and practices should aim at or concentrate on the vulnerable group of the population in the society. The vulnerable group refers to the financially weak, the aged, the illiterate, the low-income women and those who are affected most by economic disorders. It therefore makes sense to try and bring the vulnerable group into the mainstream official financial sector. One way to achieve the vulnerable group financial inclusion is by government to person (G2P) social cash transfer to the personal accounts of those considered vulnerable in the society or population. The theory is commendable in the sense that it makes conscious effort to identify the vulnerable group in the population. Identifying with them gives them a sense of belonging and hope that society is compensating them for their lack and the inequality between them and other groups.

One advantage the theory has is that it makes it easy to identify the financially excluded in the society. It is very easy to identify vulnerable individuals in society by their associations, appearance, household, neighborhood as well as income level among others. The scheme will apparently be cost saving because a vulnerable group is usually target for inclusion into the formal financial sector rather than targeting the entire population which will be cost prohibitive.

However, the theory seems to ignore non-vulnerable groups in the population which is discriminatory. Such other members of the population who would have been financially included may not because they are not classified in the vulnerable group. Another critical factor is the inclusion of women in the vulnerable group. Nowadays, a lot of women compete with men in many spheres of life. Many men also belong to the vulnerable group in the society.

2.1.3 Collaborative intervention theory

The view point of the collaborative intervention theory of financial inclusion is that through collaborative intervention of numerous stakeholders, financial inclusion can be achieved. As such, the theory supports co-operative and collaborative joint effort involving multiple stakeholders is necessary to achieve financial inclusion of the financially excluded from the formal financial sector. The theory is useful to the extent that it supports the use of several stakeholders in a collaborative intervention to achieve financial inclusion. The collaborative intervention partners will naturally feel fulfilled as major participants who have contributed to the success of a public project. However, when multiple collaborative partners are involved, the less efficient ones may abandon the project for the more active ones. Similarly, some vociferous and extroverted partners may hijack the project in the midst of highly competent and introverted collaborative intervention partners. Finally, the use of many collaborative intervention partners does not necessarily assure the success of collaborative intervention financial inclusion.

2.1.4 Financial Literacy Theory

The theory of financial literacy according to Ozili (2020), states that financial inclusion is possible through financial education of the population in order to raise their financial literacy. It is believed that raising the financial literacy of the population will encourage them to be involved in the formal financial sector. Financial literacy will educate the population on financial services and products available to them as well as the sources through which they can be obtained. The financial theory of financial inclusion will enlighten the people on investment opportunities, sources of funds, and financial risk management. The scheme does not require so much public fund to execute unlike the public good theory of financial inclusion.

Rather than ability, the financial literacy theory of financial inclusion concentrates on willingness. Possessing the ability for financial literacy is different from the willingness. You may be willing to participate in the financial literacy program but lack the capacity or ability to receive the education. The ability or capacity here means the money to participate in financial inclusion after receiving the education.

2.1.5 Community Echelon Theory.

According to Ozilli (2020) the community echelon theory of financial inclusion postulates that the financially excluded can be brought into financial inclusion by making use of their leaders, who it is believed can exert influence on them. The theory argues that community leaders can persuade their subjects to participate in financial inclusion initiatives. Leaders with

good charisma and followership can convince their subjects to embrace official financial sector practices that would bring the financially excluded into financial inclusion. Where a strong cultural affinity exists between the leader and the subjects, it will be easy to convince the subjects to embrace to actively get involved in the formal financial services sector. A major advantage of the theory is that leaders can easily convince their subordinated to participate and embrace the program. However, this theory can easily lead to discriminatory practices if the leaders are corrupt or self-serving. Similarly, some community leaders who are financially excluded themselves may not be able to bring their community members into financial inclusion. Also, the influence of the community leaders upon their subjects can lead to foisting a bad program or decision on them.

2.2 Empirical Literature

Oruo (2013) looked at the relationship between financial inclusion and gross domestic product (GDP) in Kenya. The study adopted the descriptive research design and making use of secondary data from numerous sources – within a four-year period. The researcher discovered that economic growth in Kenya has a positive and strong relationship with financial inclusion.

Babajide, Adegboye, and Omankhanlen (2015) investigated the impact of financial inclusion on economic growth in Nigeria. It aimed to highlight the determinants of financial inclusion and its impact on economic growth. Secondary data were sourced from world bank and development indicators and ordinary least square regression model was used to analyze the data. The result shows that financial inclusion is a significant determinant of the total factor of production, as well as capital per worker, which invariably determines the final level of output in the economy. This study recommends that natural and economic resources should be adequately harnessed, as alternative means of revitalization and diversification of Nigeria's oil-dependent monoculture economy.

Olaniyi (2015), in his study the effects of economic and financial development on financial inclusion in Africa provided empirical evidence on the effects of economic and financial development on financial inclusion in Africa, using panel FMOLS for the 2005-2014 period. His study shows that economic growth has a significant positive impact on financial inclusion, meaning that African countries with higher economic growth have more inclusive financial systems. GDP per capita has a significant positive impact on financial inclusion. That is, income is an important factor in explaining the level of financial inclusion in Africa. He established in this study, that both economic and financial development promotes financial inclusion, though the effects of economic development are much stronger. Also, inflation is negatively linked to financial inclusion, and as well insignificant across all specifications. Deposit interest rate is positively linked to financial inclusion, though insignificant. The low deposit interest rates in African countries do not encourage inclusive financial systems. Population, though positive, is insignificant. Internet has positive significant impact on financial inclusion, meaning that internet access is indispensable in a fast-moving and digital African economy. Literacy is also statistically significant, meaning that adult literacy is an important factor in explaining the level of financial inclusion in Africa. As well, Islamic banking presence and activity are associated with higher financial inclusion.

Sharma (2015) assessed the nexus between the vast dimensions of financial inclusion and economic development of the emerging Indian economy from 2004 to 2013. The study used vector auto-regression (VAR) models and Granger causality test to analyse the data. The empirical results and discussion suggest that there is a positive association between economic growth and various dimensions of financial inclusion, specifically banking penetration, availability of banking services and usage of banking services in terms of deposits. Granger causality analysis reveals a bi-directional causality between geographic outreach and economic development and a unidirectional causality between the number of deposits/loan accounts and gross domestic product. The results obtained favor social banking experiments in India with a deepening of banking institutions.

Onaolapo (2015), in his study examined the effects of financial inclusion on the economic growth of Nigeria (1982-2012). According to the researcher, data for the study were collected from secondary sources like Statistical Bulletins of the Central Bank of Nigeria (C.B.N.), Federal Office of Statistics (F.O.S.) 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 analysing the data. The overall results of the regression analysis show that inclusive Bank financial activities greatly influenced poverty reduction($R2=0.74$) 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 side of the equations.

Babajide, Adegboye and Omankhanlem (2015), investigated the impact of Financial Inclusion on economic growth in Nigeria. Their study aimed at highlighting the determinants of Financial Inclusion and its impact on economic growth. Their study made use of secondary data sourced from world development indicators and ordinary least square regression model was employed in analyzing the data. Their result shows that Financial Inclusion is a significant determinant of the total factor of production, as well as capital per worker, which invariably determines the final level of output in the economy. The study recommended that natural and economic resources should be adequately harnessed, as alternative means of revitalization and diversification of Nigeria's oil-dependent monoculture economy.

Nkwede (2015) investigated the influence of financial inclusion on the growth of African economy, using Nigeria as a case study from 1981 to 2013. The study employed the multiple regression models anchored on Ordinary Least Square technique to analyse the data. While controlling for other macroeconomic exogenous variables; the results show that financial inclusion has significant negative impact on the growth of Nigeria economy over the years. The researcher attributes the result to high level of financial exclusion of bankable adult citizens in Nigeria in particular and Africa in general. The researcher suggests more inclusive financial system in Nigeria (and Africa) with focus on the rural populace because 'growth is good, sustained high growth is better and sustained high growth with financial inclusiveness is best of all' especially in the developing economy.

Okaro (2016) examined the effects of financial inclusion on the Nigerian economy from 1990 to 2015. The study employed the use of Ordinary least squares (OLS) regression technique and adopted the analytical method of data analysis. The major findings were that DMBs' financial intermediation activities, financial deepening, financial accessibility, institutional infrastructures all have positive significant effect on economy growth (Real GDP) while there was no relationship between financial inclusion and poverty eradication in Nigeria. Among several recommendations were the following: government creating and enabling environment for effective financial inclusion; the structures and platforms such as bank branches, ATM and POS terminals of conventional banks should be adequately equipped in order to enhance financial inclusion by bringing those captured by the informal sector, into the formal sector and; DMBs' role in creating affordable services such as credit should attract further attention from CBN to reduce interest rate to SMEs and rural populace. The three-tiered KYC regime by the CBN is a step in the right direction.

In a related study conducted by (Okaro 2016), the author examines the effects of financial inclusion on the Nigerian economy (1990-2015). The objectives of the study included to find out the relationship between DMBS financial intermediation activities, financially deepening, and real GDP and also to ascertain the relationship that exists between financial inclusion and poverty eradication in Nigeria. The study was conducted with the use of ordinary least squares (OLS) regression analysis statistical tool and the analytical method of data analysis. The result of the tests showed that DMB's financial intermediation activities, financial deepening and financial accessibility, institutional infrastructures all have a positive and significant effect on growth of the economy (real GDP) while no relationship existed between financial inclusion and eradication of poverty in Nigeria. The study recommended the creation of an enabling environment by government for effective financial inclusion. The study also recommended that the structures and platforms like bank branches, ATM and POS terminals of all conventional banks should be sufficiently equipped to sustain financial inclusion by bringing those already in the informal sector into the formal financial sector.

Okoye (2017) investigated the effect of financial inclusion on economic growth and development in Nigeria over the period 1986-2015 using the Ordinary Least Squares technique. Financial inclusion was measured in the study using loan to deposit ratio, financial deepening indicators, loan to rural areas, and branch network. Measures of financial deepening adopted in the study are ratios of private sector credit to GDP and broad money supply to GDP. Economic growth was proxied as growth in GDP over successive periods while per capita income was adopted as a measure of poverty, hence an index of development. The study shows that (i) credit delivery to the private sector has not significantly supported economic growth in Nigeria (ii) financial inclusion has promoted poverty alleviation in Nigeria through rural credit delivery. The monetary authorities should deepen financial inclusion efforts through enhanced credit delivery to the private sector as well as strengthen the regulatory framework in order to ensure efficient and effective resource allocation and utilization.

Okoye, Olayinka and Modebe (2017) carried out a study on financial inclusion as a strategy for enhanced economic growth and development in Nigeria covering the period 1986-2015 and made use of the ordinary least squares' statistical technique. Financial inclusion in the

study was measured by loan to deposit ratio, financial deepening indicators, loan to rural areas and branch network. Financial deepening measures used in the study were rations of private sector credit to GDP and broad money supply also to GDP. Economic growth was proxied as growth in GDP over successive periods and per capita income was utilized as a measure of poverty, therefore are index of development. The findings of the study showed credit delivery to the private sector has not to a significant extent supported economic growth; financial inclusion has promoted poverty reduction in Nigeria through the rural credit delivery scheme. Therefore, the study suggested deepening of financial inclusion efforts by the monetary authorities by strengthening credit delivery to the private sector. It also recommended enhancing the financial regulatory framework for effective and efficient allocation and utilization of resources. Financial inclusion plays a pivotal role and being considered as a major factor in poverty alleviation and a key enabler of prosperity in emerging and developing markets.

Gretta (2017), in his work on Financial Inclusion and Growth studied the impact of financial inclusion on the growth of the economies in developing countries such as the Middle East and North Africa (MENA) and the BRICS region and tried to identify the various channels of transmission between financial literacy, financial intermediaries and growth. The study applied a VAR regression in order to quantify the relationship between financial inclusion in terms of financial activities, financial literacy and growth and to study its impact on the economic growth in the MENA region. His findings showed the importance of financial inclusion in the MENA and BRICS region.

Okoye, Adetiloye, Erin and Modebe (2017), in their study; financial inclusion as a strategy for enhanced economic growth and development investigated the outcome of financial inclusion on economic growth and development in Nigeria over the period 1986 to 2015 using the Ordinary Least Squares technique. They measured financial inclusion in the study using loan to deposit ratio, financial deepening indicators, loan to rural areas, and branch network. Measures of financial deepening adopted in the study are ratios of private sector credit to GDP and broad money supply to GDP. Economic growth was proxied by the researchers as growth in GDP over successive periods while per capita income was adopted as a measure of poverty, hence an index of development. The study showed that credit delivery to the private sector has not significantly supported economic growth in Nigeria and that financial inclusion has promoted poverty alleviation in Nigeria through rural credit delivery. The study recommended that the monetary authorities should deepen financial inclusion efforts through enhanced credit delivery To the private sector as well as strengthen the regulatory framework in order to ensure efficient and effective resource allocation and utilization.

Harley, Adegoke and Adegbola (2017), carried out an empirical study on the role of financial inclusion in economic growth and poverty reduction in a developing economy using panel data analysis ranges from 2006 to 2015within a log linear model specification framework. The methodology they applied to the study was extracted from the literatures they came across. 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 ATM in developing economy are outdated and thus required a technological upgrade to have a significant impact in rural areas. Their coefficient 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 services.

Nwafor, and Yomi (2018) work focused on the relationship between financial inclusion and economic growth in Nigeria from 2001 to 2016 using Two-staged Least Squares Regression Method. Findings revealed that financial inclusion have significant impact on economic growth in Nigeria and that financial industry intermediation have 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 GDP per capital of Nigeria and consequently economic growth.

Otiwu, Okere, Uzowuru, and Ozuzu (2018) examined the relationship between financial inclusion and economic growth with particular reference of microfinance for the period 1992 to 2013 using Ordinary Least Square method and employing the Johansen Cointegration tests. The study revealed that the activities of microfinance as one of the financial inclusion strategies significantly contribute to economic growth. While total loans and advances of microfinance banks significantly contribute to economic growth, total deposits inversely affect economic growth. The study also reveals the presence of long-run relationship between the variables considered (GDP, total loans and advances, total deposits, investments and number of microfinance banks) The study reveals that the growth and development of a nation is significantly dependent on the expansion of banking and financial services to the currently financially-excluded class of citizens of the country, as they possess untapped and unexplored valuable potentials that will be of tremendous to the country. In view of the benefits inherent in financial inclusion, this study recommends that microfinance banks should concentrate efforts on low-cost deposits which are in line with their operations than competing with the conventional banks in mobilizing fixed deposits that has higher cost attached to it. Financial education is also recommended to enlighten the public on benefits of a financial superstructure.

Kalu, Omeje, and Mba (2018) investigated financial inclusion in the agricultural sector in Nigeria. The study utilized survey data generated from 600 recovered questionnaires which were administered to farmers in both rural and urban locations in Nigeria. The study developed adequacy gap index and timeliness gap index to measure the penetration gap index theory of financial inclusion through the application of the pecking order theory. The adequacy and timeliness gap indices revealed that the different formal lending agencies were unable to meet the credit needs of these small-scale farmers hence, credit was inadequately and untimely provided to small scale farmers because they depend on rain-fed agriculture. The penetration gap index revealed that the penetration of financial inclusion in agricultural sector is still shallow in Nigeria. It was recommended among others that government should intensify the efforts to meet the credit needs of farmers (adequacy and timeliness) to ensure the penetration of financial inclusion.

An empirical study conducted by (Abida, Sulaiman and Migro, 2018) on financial inclusion and macroeconomic performance in Nigeria from 1981 to 2014 sourced data from the Central Bank of Nigeria statistical bulletin and made use of the ordinary least square and granger casualty tests as estimation techniques. The result of the study, using the coefficient, gross Domestic Product (GDP) was positive at constant of 2573.946. The result showed that there will be a positive variation up to 2573.946 units in GDP if all variables are held constant. This shows a positive and significant relationship between financial inclusion and macroeconomic performance in Nigeria. Therefore, the study concluded that credit to the private sector as a ratio of GDP, (CDS/GDP) money supply as a ratio of GDP (MS/GDP, and number of banks branches (NDD) exert a unidirectional relationship to GDP. The study recommended that the government and the Central Bank of Nigeria (CBN) should improve on facilitation of credit to the private sector, and money supply should be properly managed.

Lawal, Sulaiman and Migiro (2018) examined the relationship between financial inclusion and macroeconomic performance in Nigeria from 1981 to 2014. The study employs the Ordinary Least Square and Granger Causality tests as estimation techniques. From the result, using the coefficient, Gross Domestic Product (GDP) is positive at constant of 2573.946. This means that when all variables are held constant, there will be a positive variation up to 2573.946 units in GDP. This implies that there is a significant and positive effect of financial inclusion on macroeconomic performance in Nigeria. It is concluded that Credit to the Private Sector as a ratio of GDP (CPS/GDP), Money Supply as a ratio of GDP (MS/GDP), and Numbers of Bank Branches (NBB) have a unidirectional relationship to GDP while Currency Out Banks (COB), Interest Rate (INT) and Total Saving (TSA) are independent of GDP. The study therefore recommends that the government and the Central Bank of Nigeria should improve on the facilitation of credit to the private sector, and money supply should be properly managed. The Central Bank of Nigeria should encourage the provisions of more bank branches to rural and urban areas in order to promote easy access to financial services.

Olanrewaju, Tella, and Adesoye, (2019) examined the causal interactions among the institutional, financial and inclusive growth variables by employing Toda-Yamamoto (TY) Granger non-causality test within the augmented VAR framework. Annual time series, data from 1998 to 2017, were used. The TY analysis showed that all the variables, with the exception of financial inclusion index, Granger-caused inclusive growth, but without any evidence of feedback. However, a bidirectional causal relationship was found between inclusive finance and the interaction of institutional quality and financial inclusion. Thus, the null hypothesis of block exogeneity can be refuted when real GDP per person employed (RGDPE) is taken as the dependent variable. This implies that while the effects of institutional quality could vary widely in an economy, institutional quality appears to be the dominant driving force behind inclusive growth. It is, therefore, recommended that institutional improvement, beyond the present liberal democratic threshold, is much needed to effectively harness the human capital resource-base. The Nigerian government should adopt a labor-intensive development strategy, such that poor active households are comprehensively integrated into productive activities for optimal value-chain finance-growth inclusiveness. This should be able to address the protracted tripartite socio-

economic problems of poverty, inequality and unemployment in line with Lin's comparative advantage conforming hypothesis.

Kamalu, Ibrahim, Ahmad, and Mustapha, (2019) examined the causal linkages between financial development, financial inclusion, trade openness, foreign direct investment and economic growth in Nigeria from 1970 to 2018. This study employed Ng Perron, Zivot Andrew unit root test; Gregory and Hansen cointegration test; and non-Granger causality Toda and Yamamoto test. However, the results revealed that all the variables were stationary and cointegrated in the long run. The result showed one-way causal relationship from financial inclusion to economic growth, and two-way causal relationship between financial development and economic growth. However, there is no causal relationship between trade openness and economic growth. Therefore, the study concludes that financial development and financial inclusion is an important determinant of economic growth. Thus, the impact on growth is even more pronounced when more people have access to formal financial services. Hence, access to affordable and appropriate formal financial products and services for all especially poor and disadvantaged members of society should be provided, and policies to encourage credits to private sector should be given due consideration in order to achieve more growth in Nigeria.

Suidarma (2019) analyzed the influence and long-term relationship of financial inclusion through the instrument of the number of Automatic Teller Machine (ATM)s and commercial bank branches on ASEAN economic growth through Gross Domestic Product (GDP). The data used is secondary data in the form of an annual panel consisting of ASEAN countries with the period of 2008-2015 for the purpose of seeing the impact after the global crisis that occurred. The method used Panel Vector Error Correction Model (VECM) to see the long-term relationship and the GDP response when shocks occur in the variable financial inclusion. The result of estimation shows that financial inclusion through the number of ATMs and the number of branches of commercial banks was able to contribute positively to economic growth in ASEAN.

A study conducted by Anh, Loan, Duc and Michael (2019) investigated the linkages between financial inclusion and macroeconomic stability for 22 emerging and frontier economics from 2008-2015 with specific focus on a potential optimal level. The study utilized the panel threshold estimation technique. The empirical results showed that financial inclusion, as approximated by the growth rate in the number of bank branches over 100,000 account holders, was found to enhance financial stability under a certain threshold.

Also, a research investigation carried out by (Adedigba and Ogunviyi, 2019) sort to find out the relationship between macroeconomic variables and Nigeria's economic growth. The study used seven predictor variables namely inflation, pressure, exchange rate depreciation, money supply, credit to private sector, total debt, total revenue and credit to public sector and explainable variables such as gross domestic product (GDP) and drawing data from the Central Bank statistical bulletin for a period of 31 years, 1984-2015. The study used economic technique of descriptive statistics, ADF and PP unit root test in addition to Eagle VAR granger casualty and multiple regression analysis. The result of the study revealed that inflation virtually affects

all macro variables used in the study. The study recommended moderation of price level as well as corruption in the economy.

Erlando, Riyanto, and Masakazu (2020) analyzed the contribution of the financial inclusion to economic growth, poverty alleviation and income inequality in Eastern Indonesia. The study used Toda-Yamamoto VAR bivariate causality model and the dynamic Panel Vector Autoregression (PVAR) were used for the analysis. The results of the bivariate causality model indicate a high relationship level between financial inclusion, economic growth, poverty, and income distribution in Eastern Indonesia. The socio-economic growth has a positive impact on the level of financial inclusion, with a negative impact on poverty. Meanwhile, financial inclusion has a positive effect on inequality, which leads to widespread income inequality in Eastern Indonesia. The study found financial inclusion to be of benefit to maintaining stable inflation and output growth.

Fowowe (2020) empirical investigated the effects of financial inclusion on agricultural productivity in Nigeria. This study makes use of the Living Standards Measurement Study–Integrated Surveys on Agriculture (LSMS-ISA). This is a new data set on agricultural households which contains information on agricultural activities and various household activities, including banking, savings and insurance behavior. Considering the data are such that there are observations for households over three time periods, the study exploits the time series and cross-section dimension of the data by using panel data estimation. Findings – The empirical results of the study show that financial inclusion, irrespective of how it is measured, has exerted positive and statistically significant effects on agricultural productivity in Nigeria.

Rosmah, Zuulkefly, Aisyah&Tamat (2020) did a research investigation on the effect of financial inclusiveness on growth in selected developing and developed countries (63 countries) for the years 2014-2017. The level of financial inclusiveness for each country was calculated using a new construction of the financial inclusion index. The role of financial inclusiveness on economic was estimated using a cross-sectional threshold regression technique. The study result indicated there is a threshold effect of the financial inclusiveness –growth nexus, which indicates that financial inclusiveness exerts a non-monotonic positive relationship with economic growth. As the study reveals, the positive effect is more glaring at a high level than in the low level of financial inclusion index. The researchers expressed the view that the result of the study should serve as motivation source for policy makers and indeed the formal financial sector in increasing financial inclusion scope or level in enhancing sustainable economic growth.

3. Methodology

3.1 Analytical Framework

The analytical framework for this paper anchored on the work of Lawal, Sulaiman, and Migiro (2018) with further modification. Lawal, Sulaiman, and Migiro (2018) which examined the effect of financial inclusion on macroeconomic performance in Nigeria modeled GDP as the dependent variable as a proxy for macroeconomic performance as a function of Credit to the Private Sector as a ratio of GDP (CPS/GDP), Money Supply as a ratio of GDP (MS/GDP),

Number of Bank Branches (NBB), Currency Out Banks (COB), Interest Rate (INT) and Total Saving (TSA) as the independent variables to capture financial inclusion. That is,

GDP = f (CPS/GDP, MS/GDP, NBB. COB, INT, TSA) (1)

Where: Credit to the Private Sector as a ratio of GDP (CPS/GDP), Money Supply as a ratio of GDP (MS/GDP), Numbers of Bank Branches (NBB), Currency outside Banks (COB), Interest Rate (INT) and Total Saving (TSA).

Away from Lawal, Sulaiman, and Migiro's (2018) specification, the present paper made some modifications. First, this paper used the Collaborative Intervention Theory (CIT) of financial inclusion as the main theoretical framework. Secondly, the present study adopts quarterly data set from 2009Q1 to 2020Q4 for the variables in the models. Furthermore, real gross domestic product was used in the study as proxyforeconomic growth and used number of points of sale (POS), loans of rural branches of deposit money banks (LRB),credit barriers (CRB) and deposit money banks' loan to small scale enterprises (LSE) to the capture the World Bank's (2015) measurement of financial inclusion indicators in an economy. From the foregoing the functional relationship in the models is expressed as:

RGDP = f(ACI, USI, QUI, IMH) (2)
Where: RGDP = Real Gross domestic product a proxy for economic growth

ACI = Access Indicators of financial inclusion proxied by the number of Point of Sale (POS)
USI = Usage Indicators of financial inclusion proxied by Loans of Rural Branches of deposit money Banks (LRB)
QUI = Quality Indicators of financial inclusion measured by credit barriers i. e. depth of credit information index

IMH = Impact on household and firms measured by deposit money banks Loans to Small Scale Enterprises (LSE)
Equation (2) can be expressed in a multiplicative form of:

$$RGDP_t = \beta_0 POS_{it}^{\beta 1} LRB_{it}^{\beta 2} CRB_{it}^{\beta 3} LSE_{it}^{\beta 4} u_{it} \quad (3)$$

Where:RGDP = Economic growth proxied by Real Gross Domestic Product (N, Million)
POS = Number of Point of Sale (POS)
LRB = Loans of Rural Branches of Commercial Banks (₦' Million)
CRB = Quality Indicators of financial inclusion proxied by credit barriers (i. e. depth of credit information index)

LSE = Commercial Banks Loans to Small Scale Enterprises (₦' Million)
Equation (3) was transformed into a log-linear form as follows:

$$\text{Log}(RGDP)_t = \beta_0 + \beta_1 \text{Log}(POS)_t + \beta_2 \text{Log}(LRB)_t + \beta_3 \text{Log}(CRB)_t + \beta_4 \text{log}(LSE)_t + \mu_1 \quad (4)$$

Where; $\beta_{0,}$ is the intercept; β_1 – $\beta 4_{,}$ are the coefficients of independent variables while μ_1 is the error term and RGDP, POS, LRB, CRB and LSE are as earlier defined.

3.2 Data Required/Sources

The data for this study is mainly be quarterly time series collected from secondary sources covering a period of ten years, from 2009Q1 to 2020Q4. Some of these sources include publications of the Central Bank of Nigeria (CBN) statistical bulletin and annual report and statement of accounts and world development indicators (WDI).

3.3 Estimation Techniques and Procedures

This study employed descriptive statistics, unit root test, and Toda Yamamoto modeling technique

3.3.1 Descriptive Statistics

One of the methods economists normally use to investigate the cause-effect relationship between variables is through descriptive statistics. Descriptive statistics is that type of statistics that involves organizing, summarizing and presenting data in a meaningful form or usable format. Thus, in this research, simple averages (i. e. mean), histogram, kurtosis, Jarque-Bera, and more were employed to analyze the trends on some of the variables used in this study between 2009Q1 and 2020Q4. The descriptive statistics was used to see the behavior of the variables or the time series properties of the variables.

3.3.2Unit Root Test

The unit root test that was considered is the conventional unit root test by Augmented Dickey-Fuller (ADF) (1979). The null hypotheses for ADF are that an observable time series is not stationary (i. e. has unit root). The tests method was well established in the literature. The major limitation to this unit root test method (ADF) is that it did not include any structural breaks in the series.

3.3.3 Toda Yamamoto Modeling Technique

The dynamic granger causality can be captured from the vector error correction model derived from the long-run cointegrating relationship Granger (1988). The granger causality proposed by Granger (1969) has probable shortcomings of specification bias and spurious regression. Engel and Granger (1987) have defined X and Y as being cointegrated if the linear combination of X and Y is stationary but each variable is not stationary. Engel and Granger (1987) pointed out that while these two variables are non-stationary and cointegrated, the standard Granger -causal inference will be invalid.

To mitigate these problems, Toda and Yamamoto (1995) is a causality test that is based on augmented VAR modeling. It introduced a modified Wald test statistic (MWALD). This procedure has been found to be superior to ordinary Granger - causality tests since it does not require pre-testing for the cointegrating properties of the system and thus avoids the potential bias associated with unit roots and cointegration tests as it can be applied regardless of whether a series is I(0), I(1) or I(2), non-cointegrated or cointegrated of an arbitrary order.

The Toda Yamamoto approach, first involves finding the maximum order of integration d_{max} of the series that are to be incorporated in the model. For this conventional ADF unit root test is applied in each series and the maximal order of integration is identified. Say, with ADF unit root test, three variable are found to be I(0), I(1) and I(1) respectively, then the maximal order of integration is 1. TYDL approach, secondly, specifies a well behaved kth optimal lag order vector autoregressive model in levels (not in the difference series).

The number of optimal lags is usually determined by a selection criterion such as the

Akaike Information criterion (AIC), Bayesian information criterion (BIC), or Schwarz Info Criterion (SIC) or the democracy of these criterion which ever makes the VAR well behaved in term of AR unit root graph, VAR residual serial correlation LM-stat, VAR residual normality tests. TYDL approach, thirdly, intentionally over-fits the underlying model is with additional d_{max} order of integration. The d_{max} is the maximal order of integration of the series in the model.

The Toda Yamamoto equation is stated in general form as follows:

$$Yt = \alpha_0 + \sum_{t=1}^{k} \alpha_{1i}\, Yt-1 + \sum_{j=k+1}^{k+dmax} \alpha_{2j}\, Yt-j + \sum_{t=1}^{k} \beta_{1i}\ \ X1t-1 + \sum_{j=k+1}^{k+dmax} \beta_{2j}\, X1t-j + \sum_{t=1}^{k} \Omega_{1i}\, X2t-1 + \sum_{j=k+1}^{k+dmax} \Omega_{2j}\, X2t-j + \sum_{t=1}^{k} \Omega_{1i}\, X3t-1 + \sum_{j=k+1}^{k+dmax} \Omega_{2j}\, X3t-j + \sum_{t=1}^{k} ¥_{1i}\, X4t-1 + \sum_{j=k+1}^{k+dmax} ¥_{2j}\, X4t-j + \varepsilon 1t \qquad (5)$$

Where;

Y_i = Dependent variables (RGDP); X_1 - X_8 = the independent variables (POS, LRB, CRB and LSE, ATM); K = the optimal lag length. This is determined by the usual information criteria such as AIC and SIC and d_{max} = the maximum order of integration

4. Results and Discussions

The analyses of the data started with the descriptive statistics to ascertain the behavior or stationarity of the variables. Secondly, the unit root test and the Toda Yamamoto modeling techniques were thereafter used for the analysis.

4.1 Descriptive Statistics

Table 1 presents the result of the descriptive statistics of the variables employed in the estimations in this study.

Table 1: Descriptive Statistics Test Results

	RGDP	POS	LRB	CRB	LSE
Mean	64708.06	1.38E+08	257313.9	4.416667	30997.45
Median	68079.76	32107994	201549.0	6.000000	15231.98

Maximum	71387.83	4.94E+08	988587.9	8.000000	96597.48
Minimum	49856.10	918256.0	15590.50	0.000000	10747.89
Std. Dev.	6281.677	1.78E+08	271947.9	3.545049	29860.88
Skewness	-0.892518	0.972182	1.223992	-0.320850	1.334179
Kurtosis	2.455490	2.264176	3.565155	1.292366	3.012007
Jarque-Bera	6.965687	8.643981	12.62405	6.655587	14.24055
Probability	0.030720	0.013273	0.001814	0.035872	0.000809
Sum	3105987.	6.65E+09	12351066	212.0000	1487877.
Sum Sq. Dev.	1.85E+09	1.50E+18	3.48E+12	590.6667	4.19E+10
Observations	48	48	48	48	48

Source: Authors' Computation (2021)

The result of the descriptive statistics in Tables 1 shows that the mean values of the variables – RGDP, POS, LRB, CRB and LSE are 64708.06, 1.38E+08, 257313.9, 4.416667 and 30997.45,respectively. From Table 1, the standard deviation showed that LRB (271947.9) was the most volatile variable in the series while CRB (3.545049) was the least volatile variable.The skewness statistic showed that RGDP and CRB were negatively skewed; suggesting that their distribution has a long-left tail while POS, LRB and LSE were positively skewed, meaning that their distribution has a long right tail. Also, the kurtosis statistic showed that the variables - RGDP, POS, and CRB were platykurtic suggesting that their distribution were flat relative to normal distribution; LSE was mesokurtic suggesting that its distribution is normally distributed while LRB were leptokurtic suggesting that its distribution is peaked relative to normal distribution. Based on these observations, it indicates that the series are non-stationary. However, this indication is not surprising, since the data are time series in nature. In sum, there is unit root (non-stationarity) in the series.

Based on these observations, it is therefore necessary to test for the stationarity of the variables and the long run relationship. The unit root test is conducted so as to make the variables stationary. The study utilized the Augmented Dickey Fuller (ADF) unit root test procedure.

4.2 Unit Root Test Results

Tables 2 and 3 present results of stationarity test for each of variables using Augmented Dickey Fuller (ADF) and KPSS tests.

Table 2: ADF Unit Root Test Results

Variables	ADF at Level	ADF at 1st Difference	ADF at 2nd Difference	Status	Remarks
RGDP	-2.227225	-2.132442	-6.585048	I(2)	Stationary
POS	-1.578054	-3.034904	-	I(1)	Stationary
LRB	-2.249702	-4.668336	-	I(1)	Stationary
CRB	-1.308695	-2.733889	-6.557439	I(2)	Stationary
LSE	-1.103363	-2.708619	-8.016973	I(2)	Stationary

Critical Values					
1% level	-3.581152	-3.581152	-3.584743		
5% level	-2.926622	-2.926622	-2.928142		
10% level	-2.601424	-2.601424	-2.602225		

Source: Authors' Computation (2021)

The outcomes of ADF unit root test in Table 2 reveals that POS and LRB were stationary at first difference, i.e. I (1), while RGDP, CRB and LSE were stationary at second difference, i.e. I(2). Hence, this study concludes that the variables used in model were integrated of different order integration, that is, I (1) and I(2).

Table 3: KPSS Unit Root Test Results

Variables	**KPSS at Level**	**KPSS at 1st Difference**	**KPSS at 2nd Difference**	**Status**	**Remarks**
RGDP	0.806340	0.712310	0.105823	I(2)	Stationary
POS	0.887920	0.288411	-	I(1)	Stationary
LRB	0.378160	-	-	I(0)	Stationary
CRB	0.815950	0.119110	-	I(1)	Stationary
LSE	0.562872	0.228261	-	I(1)	Stationary
Critical Values					
1% level	0.739000	0.739000	0.739000		
5% level	0.463000	0.463000	0.463000		
10% level	0.347000	0.347000	0.347000		

Source: Authors' Computation (2021)

The result of the KPSS presented in Table 3 reveals that LRB was stationary at levels, i.e. I(0);POS, CRB and LSE were stationary at first difference, i.e. I(1) while RGDP was stationary at second difference, i.e. I(2). Hence, this study concludes that the variables used in model were integrated of different order integration, that is, I I(0), I(1) and I(2).Since the ADF results indicate that the series are of the different order of integration, we proceed to conduct the Toda Yamamoto modeling technique.

4.3 Lag Order Selection

An important preliminary step in model building and estimating the Toda Yamamoto model is the selection of the lag order. In this study we use some commonly used lag-order selection criteria to choose the lag order, such as the "Akaike information criterion (AIC)", "Schwartz criterion (SC)", "Hannam-Quinn criterion (HQC)" and "final prediction error (FPE)" to determine the optimum lag and then analyze the residuals.

Table 4: Optimum Lag Test Results

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-161.1671	NA	0.000945	7.224655	7.423421	7.299114
1	278.3059	764.3009	1.42e-11	-10.79591	-9.603318	-10.34916
2	326.9237	73.98350*	5.29e-12*	-11.82277*	-9.636349*	-11.00372*

Source: Authors' Computation (2021)

Table 4 shows that lag 2 is chosen as the optimum lag in the specification of Toda Yamamoto model on the relationship between the variables in this study for the period between 2009Q1 and 2020Q4. Thus, we now estimate and analyze the Toda Yamamoto model.

4.4 Toda Yamamoto Test Results

The results of the Toda Yamamoto estimation results are offered in Table 5. The result of the Toda Yamamoto causality test in Table 5 reveals that there is no causality running from Number of Point of Sale (POS) to Economic Growth (RGDP) in Nigeria within period of study. This is shown by the chi-sq value of 1.025618 and probability value of 0.5988 which is greater than the 0.05 percent. This implies that the Number of Point of Sale (POS) do not have a causal impact in the short-run on Economic Growth (RGDP) in Nigeria. The implication of this finding is that Number of Point of Sale (POS) does not cause an increase in Economic Growth (RGDP) in Nigeria.

Table 5: Toda Yamamoto Causality Test Results

Dependent variable: LOG(RGDP)			
Excluded	Chi-sq	Df	Prob.
LOG(POS)	1.025618	2	0.5988
LOG(LRB)	3.788793	2	0.1504
CRB	5.144721	2	0.0764
LOG(LSE)	0.048008	2	0.9763
All	10.81451	8	0.2124
Dependent variable: LOG(POS)			
Excluded	Chi-sq	Df	Prob.
LOG(RGDP)	1.955805	2	0.3761
LOG(LRB)	0.408742	2	0.8152
CRB	4.170494	2	0.1243
LOG(LSE)	0.777788	2	0.6778
All	8.324084	8	0.4025
Dependent variable: LOG(LRB)			
Excluded	Chi-sq	df	Prob.
LOG(RGDP)	1.679296	2	0.4319
LOG(POS)	4.042833	2	0.1325
CRB	4.819713	2	0.0898
LOG(LSE)	4.659599	2	0.0973
All	14.67358	8	0.0658
Dependent variable: CRB			
Excluded	Chi-sq	df	Prob.
LOG(RGDP)	3.098741	2	0.2124
LOG(POS)	2.017779	2	0.3646
LOG(LRB)	1.307671	2	0.5200
LOG(LSE)	7.523422	2	0.0232

All	9.385960	8	0.3108
Dependent variable: LOG(LSE)			
Excluded	Chi-sq	df	Prob.
LOG(RGDP)	4.685411	2	0.0961
LOG(POS)	0.090101	2	0.9559
LOG(LRB)	0.116043	2	0.9436
CRB	0.803137	2	0.6693
All	7.114870	8	0.5243

Source: Authors' Computation (2021)

The result of the Toda Yamamoto causality test in Table 5 also reveals that there is no causality running from Loans of Rural Branches of deposit money Banks (LRB) to Economic Growth (RGDP)in Nigeria within period of study.This is shown by the chi-sq value of 3.788793 and probability value of 0.1504 which is greater than the 0.05 percent. This implies that increase Loans of Rural Branches of deposit money Banks (LRB) do not have a causal effect on Economic Growth (RGDP)in the short-run in Nigeria within period of study. The implication of this finding is that increase in Loans of Rural Branches of deposit money Banks (LRB) do not increases Economic Growth (RGDP in Nigeria.

The results in Table 5 on Toda Yamamoto causality test further reveals that there is no causality fromcredit barriers (CRB) to Economic growth (RGDP)in Nigeria within period of study.This is shown by the chi-sq value of 5.144721 and probability value of 0.0764 which is greater than the 0.05 percent. This implies that credit barriers (CRB) do not have a causal effect in the short-run on Economic growth (RGDP) in Nigeria within period of study.The implication of this finding is that credit barriers CRB) is not the major cause of Economic growth (RGDP) in Nigeria.

Furthermore, Table 5 also shows that there is no causality running from deposit money Banks Loans to Small Scale Enterprises (LSE) to Economic Growth (RGDP) in Nigeria within period of study.This is shown by the chi-sq value of 0.048008 and probability value of 0.9763 which is greater than the 0.05 percent. This implies that deposit money Banks Loans to Small Scale Enterprises (LSE) do not have a causal effect in the short-run on Economic Growth (RGDP) in Nigeria within period of study. The implication of this finding is that an increase in deposit money Banks' Loans to Small Scale Enterprises (LSE) does not increase Economic Growth (RGDP) in Nigeria.

5. Conclusion and Policy Recommendations

This paper investigates empirically the effect of financial inclusion on Economic Growthin Nigeria using quarterly time series covering the period 2009Q1 and 2020Q4. To accomplish this objective the study used descriptive statistics, unit root test and Toda Yamamoto causality modeling techniques for the analysis. The study shows that POS, LRB, CRB and LSE do not have a causal effect on RGDP both jointly and individually at 5 percent level. The study therefore concludes that financial inclusion has not enhancedeconomic growth in Nigeria within the period of study.The study t recommends that government should create enabling environment

for effective financial inclusion.The structures and platforms such as bank branches and POS terminals of conventional banks should be adequately equipped in order to enhance and sustain financial inclusion by bringing those in the informal sector into the formal financial sector. Deposit money banks' role in creating affordable services such as credit should attract further attention from CBN to reduce interest rate to SMEs and the rural populace. The monetary authorities should deepen financial inclusion efforts through enhanced credit delivery to the private sector as well as strengthen the regulatory framework in order to ensure efficient and effective resource allocation and utilization.

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