

FINANCIAL SECTOR REFORMS AND ECONOMIC GROWTH IN NIGERIA.

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Abstract: This study examines financial reforms and its effect on economic growth in Nigeria. the innovation in the financial system which has led to more inclusiveness through ATMs, POS etc needs to be examine to find out empirically how it impacts on growth. Data from CBN from 1987 to 2022 were use for the analysis. The technique of Ordinary Least square (OLS) was used, employing the framework of cointegration analysis, granger causality test, Error correction mechanism (ECM), as well as the unit root test. The study found out that, financial innovation indicators such as ratio of bank assets to GDP, real interest rate and volume of ATM transactions impacted positively on economic growth in Nigeria for the covered period. The study recommends that the positive impact of real interest rate and interest rate spread on economic growth calls for the attention of the Apex bank to direct commercial banks to increase savings deposit rate and reduce lending rate. An increase in savings deposit rate will attract more savings to the banks which could be channeled into investment purposes.

Keywords: Innovation, inclusiveness, financial Reform, growth, Nigeria.

Word count: 177

INTRODUCTION

Financial sector reforms development has played vital roles in promoting economic growth through financial intermediation and financial deepening. Several studies (such as Zhang and Yao, 2002; Waqabaca, 2004; Ang, 2007; Katiricioglu, Kahyalar and Benar, 2007; Adelakun, 2010; Ezzo, 2010; Nkoro and Uko, 2013) among others have investigated and confirmed positive influence of financial sector development on economic growth. This development has brought with it changes in the form of financial innovation and e-banking. By financial innovation, we mean the evolution of new financial instruments, products, services and new structure of financial sector organization in a complete and very sophisticated financial system (Noyer, 2007).

Financial innovation has been considered a powerful force driving financial system deepening and hence economic growth in the development of modern economies. This is because, financial innovation has capability of raising the efficient working of financial intermediation process by increasing varieties of financial services and products, which results to improvement in the matching of individual savers needs with firms requiring funds, and the resulting capital accumulation leading to economic growth (Chou & Yuan, 2007).

Financial innovation has so many benefits it brings to any economy, including the Nigerian economy. They include enhancing financial intermediation by mobilizing more savings from surplus households and making same available for deficit entities, which leads to economic growth; reduction in transaction costs through higher productivity of capital leading to higher levels of economic growth; emergence of new financial institutions which collect available information so as to channel investible funds in to investment avenues that yield the highest returns and creation of new securities, etc.

In Nigeria, the financial system has undergone series of reforms over the course of time, aimed at repositioning it for optimal performance and efficiency and hence economic growth. Till date, five major financial sector reforms

can be distinguished. The first was the deregulation of the financial system in 1986 following the implementation of the structural adjustment programme (SAP). The second commenced in the late 1993 through 1998 with the re-introduction of regulations policy. The third came in 1999 and witnessed the coming back of the liberalization policy in the financial system, which existed side by side with the implementation of distress resolution programmes. The fourth took place in 2004 which was tagged the recapitalization and consolidation of the banking sector in Nigeria. Finally, the fifth reform is the cashless policy which was implemented in 2011.

The financial systems reforms which culminated in the removal of administered regulation of the banking sector in terms of removal of ceiling on credit, dismantling of selective credit policy, deregulation of foreign exchange and interest rate. The reforms in the Nigerian financial system have resulted to the emergence of new financial sector products and services in the financial system market. The successful introduction and operation of these services have been boosted by the advancement in information and communication technology (ICT) currently experienced in the country. With the emergence of mobile telecommunication and internet services in the country, the financial system has bubbled with flurry of products and services including the use of debit/credit/prepaid cards for electronic payments via Point of Sale (POS) terminals and Automated Teller Machines (ATMs), internet banking, mobile payment, direct debits/credits, personal computer banking, and Real-Time Gross Settlement System (RTGS), amongst others.

More so, given the fact that the Nigerian financial system (like other developing economies) is increasingly integrated with the international markets and hence developed economies' financial system which demands that the domestic financial system has to keep pace with financial developments in the developed economies by re-organizing its financial system to be in line with the major happenings in the world. This globalization of the financial system has led to rapid proliferation of financial innovation in the Nigerian financial system.

One channel through which financial innovation can promote economic growth is financial inclusion. In its simplest form, financial inclusion is considered as the ease to access financial services at a cost that can be afforded by people who are considered as vulnerable groups and with low incomes (Raman, 2012). Prior to government policies aimed at financial inclusion, the outlook of the economy of Nigeria was rightly described as cash-based with the greater proportion of its narrow money stock held as cash outside the banking system. Statistics have shown that currency outside the banking system in Nigeria has continued to rise in absolute terms in spite of efforts at financial inclusion.

Statement of the problem

In spite of the benefits of financial inclusion, it has been documented that a significant proportion of the world population is still without accessibility to basic banking services. For instance, Demircuc-Kunt and Klapper (2012) in their study revealed that almost half of the adult population in the world have no accessibility to banking facilities and up to 35 per cent of them who do not have access attributed the problem to high cost, long distance and lack of information available.

In Nigeria, the financial access survey conducted by Enhancing Financial Innovation and Access (EFInA) in 2008 established that only about 21 percent of Nigerians have bank accounts while 2 percent were relying on using micro finance operators as their banks and 24 percent of the population of Nigeria got their financial needs from informal facilities such as savings clubs. This left about 46 million Nigerians representing about 53 percent of the entire population with no accessibility at all to either any formal or informal financial services.

The high percentage of the Nigerian population without access to financial services suggests high level of financial exclusion. Furthermore, the exclusion of greater proportion of the Nigerian population means that more Nigerians lack investible funds to and hence cannot take part in production. This could lead to the decline in total output and economic growth. Subsequent survey in 2010 by EFInA showed mild improvement as the proportion of Nigerians with accessibility to banking facilities and services had risen significantly from 21 percent to 30 percent. In all, the report found that the proportion of the population of Nigeria with no accessibility to both formal and informal financial services declined from 53 percent two years later to 47 percent.

The reason for low proportion of banked Nigerians has been attributed to low literacy level in the country. This is so because Nigeria is considered as one of the countries with lowest literacy level, with the literate population put around 30 percent. This development has affected participation in banking industry, as well as the economy (CBN, 2012). The same study carried out by EFInA,(2010) also established clearly through its survey that exactly 39.2 million individuals, which stands for about 46.3 per cent of the total population of adults in Nigeria are financially excluded.

The study further revealed that out of the 53.7 per cent of the population of adults who have accessibility to finance, 36.3 per cent obtained their financial requirements from the official financial institutions, while the remaining 17.4 per cent completely relied on unofficial or informal financial service providers (CBN, 2012). The outcome of their survey when compared with those of South Africa with 26 per cent, Botswana with 33 per cent and Kenya with 32.7 per cent revealed that Nigeria is lagging behind these countries in percentage of adults excluded from access to financial services EFInA,(2010).

There is also wide disparity among the geopolitical zones on the percentage of unbanked adults in Nigeria. A study by EFInA (2010) revealed that 73 percent of the population of adult people in the North-West are unbanked; 85 percent in the North-East, 87 percent in the North Central, 59 percent in the South-South; 61 percent in the South-East; and 58 percent unbanked adult in the South-West. Large disparity on access to finance also exists between male and female, with male Nigerians having access to finance than female Nigerians. Statistics have shown that about 52 percent of adult female Nigerians are excluded financially compared to about 41 percent of the adult male Nigerians (EFInA, 2010).

Compared to some of its contemporaries, statistics have shown that Nigeria exhibits a low formal payment penetration rate of 21.6 percent as against 46 per cent obtained in both Kenya and South Africa, while accessibility to savings accounts in Nigeria stood at an average of 461 savings accounts for every 1000 population when compared to 2,063 savings accounts for every 1000 population in Malaysia (Mbutor & Uba, 2013). Evidence has also shown that the number of automated teller machines (ATMs) in Nigeria deployed at the end of 2011 was 9,640, representing an average of 11 number of Automated Teller Machines (ATMs) for every 100,000 adults population of Nigeria, compared with an average of 59 number of Automated Teller Machines (ATMs) for every 100,000 adult population in South Africa, 42 Automated Teller Machines (ATMs) for every 100,000 adult population in Argentina, 13 Automated Teller Machines (ATMs) for every 100,000 adult population in Indonesia, 56 Automated Teller Machines (ATMs) for every 100,000 adult population in Malaysia, and 120 Automated Teller Machines (ATMs) for every 100,000 adult population in Brazil.

Given the scenario above, the study seeks to provide answers to the following basic questions: Does financial innovation have any significant impact on economic growth in Nigeria? Does financial inclusiveness have any significant impact on economic growth in Nigeria? And Are there any causal relationships among financial innovation, financial inclusiveness and economic growth in Nigeria?

The objective of this study is to examine the impact of financial innovation and financial inclusiveness, as reform agents, on economic growth in Nigeria.

Concept of financial innovation

There is no consensus as to how financial innovation should be defined. In essence, the concept of financial innovation varies from one country to another depending on the types of financial reforms and development prevailing in a particular economy at a particular time. By and large, financial innovation is the evolution or the coming into existence of new financial products, services and instruments and new structural forms of organization in a more complete and sophisticated financial system (Noyer, 2007; Solans, 2003).

In a broader sense, financial innovation covers a wide range of variations in the depth and structure of the financial system, the methods by which financial services are provided, the functions of the financial institutions, and the introduction of procedures and products in the anticipation of deregulation (Nyamongo & Ndirangu, 2013). Noyer (2007) has enumerated the positive effects of financial innovation to include: (1) improvement in resource allocation, thereby supporting longer-term growth prospects, (2) reduction in growth volatility, arising

from a more flexible financial structure which financial innovation brings with, (3) enhancing credit developments by making it easier for banks to hedge credit risk and manages maturity and credit mismatches.

In a wider definition, Ho (2006) asserted that financial innovation involves the emergence of new financial product or service, new organizational form, or new processes for a more developed and complete financial markets that makes for reduction in risks and costs and at the same time ensure improvement in the delivery of services concomitant with the requirements of the participants in the financial system.

Noyer (2007) opined that financial innovation does not only promote information dissemination but it also ensures that such information dissemination travels at a faster pace into the financial system and into market prices of the various financial instruments. This scenario is usually important when undertaken monetary policy actions, which could go a long way to ensure effective workings of monetary policy via the channel of interest rate transmission mechanism. A part from enhancement of monetary policy, the author is also of the view that financial innovation encourages the holding of financial instruments (assets). The holding of financial assets is made possible by lowering of transaction costs, enhancement of arbitrage, funding, hedging and strategizing on investment options. The author further held that financial innovation plays significant role by given investors wider accessibility to security markets by reducing information asymmetry in the market via the credit channel.

Financial inclusion and economic growth

Significant number of studies exists investigating the impulse of financial inclusiveness on economic growth both in the developed and in the developing economies. Burgeas and Pande (2005) empirically assessed the impact of financial access to poverty reduction, employing utility reduction utilizing state-level panel data in India, using data spanning from 1969 to 2000. The results of their investigation provided evidence showing that the number of branches in the rural areas resulted to significant reduction in the poverty level of the rural households. This study concluded that financial inclusion has led to enhancement of the Indian's economic growth and economic development as it promoted access to financial services and reduced poverty level in the rural areas.

Andrianaiivo and Kpodar (2011) empirically investigated the growth triggering impulse of financial inclusion through the channel of mobile phone development for a set of African economies for the time frame running from 1988 to 2007, using the system generalized method of moment (GMM) enquiry technique. The result of this research enquiry illustrated that information and communication technology's development contributed magnificently to Africa's economic growth. The result further showed that financial inclusion, proxied by the number of deposit and loan per head is growth enhancing. Importantly, the result also demonstrated that the mobile phone interaction penetration and financial inclusion exhibited significant direct impulse on economic growth in Africa.

Bruhn and Love (2013) examined the impact of increased opening of bank branches (Banco Azteca) on regional economic development in Mexico. The empirical findings from this study should that the increased opening of bank branches (i.e Banco Asteca) in more than a thousand Grupo Flextra retail stores has led to a substantive impulse on the regional economy of Mexico. In particular, the opening of thousand branches of banks has led to a 7 percent increase in income level in the regions where Banco Azteca branches were available. The result of also revealed that households where Banco Azteca opened branches were able to better smooth consumption and accumulated more durable house-holds goods. Further examination of the results established the percentage of rural households who saved tell by 6.60 percent for communities in which households were relying less on savings as a buffer against income fluctuation whenever formal credit facilities become available.

Mbutor and Uba (2013) undertook empirical investigation into the effect of financial inclusion on the effective performance of monetary policy in Nigeria using time series annual data stretching from 1980 to 2012. The variables considered by the authors for this study included inflation and used as a monetary policy variable and commercial banks average lending rate, loans and advances of deposit money banks, rural branch deposited and loans, exchange rate and number of bank branches, which were the dependent variables. The number of deposit money banks branches was used as a variable measuring financial inclusion. The study adopted the Johansen-Jesulius co-integration test to ascertain the existence or non-existence of long-time association among the captured variables. The estimation of the stated equation was made possible by the use of the ordinary least square

regression method to actualize the estimates of the specified relationship.

The results from this study showed that the indicator of financial inclusion (number of bank branches) demonstrated a positive and significant impulse on the effective workings of monetary policy in Nigeria. The results also illustrated that there was a significant direct impulse of exchange rate on inflation rate and hence the effective working of monetary policy in Nigeria. On the other hand, the results showed that rural branch deposits and loans of commercial banks have negative impact on inflation rate in Nigeria during the evaluation period. Furthermore, loans and advances of commercial banks have negative and significant relationship with inflation in Nigeria.

Lastly, the results revealed that commercial banks average lending rate has negative and significant impulse on inflation rate for the enquiry period in Nigeria. The test outcome arising from the co-integration assessment revealed that there were occurrences of two co-integrating equations deploying the maximum eigenvalue test and the trace test, demonstrating that there occurred a long-term linkage among the concerned variables. The author recommended that the central bank should put more effort in promoting financial inclusion in Nigeria as this has the potentiality to improve the effective performance of monetary policy in Nigeria and hence economic growth ultimately.

Clamara, Peria and Tuesta (2014) examined the socio-economic factors affecting financial inclusion in Peru, utilizing micro-level data surveyed in 2011. The data collected were estimated using maximum likelihood method. The results of the estimation should that people living rural areas have limited access to financial inclusion. The result showed that living in rural area has significant negative relationship with financial inclusion in Peru. The result also showed that being a woman has significant negative relationship with financial inclusion. This means that women are more prone to being excluded from financial services in Peru. Further examination of the results should that people with low educational level has limited access to financial services in Peru.

Similarly, findings revealed that people with low income were likely to be excluded from accessing financial products and services from financial institutions. Meanwhile, the results revealed that workers without wage have significant negative relationship with financial inclusion. The study further showed that household with financial need was more likely to use banks than those who have the capacity to save. On the other hand, the results revealed that literate households have increase access to financial services than illiterate households.

On barriers to financial inclusion, the study identified some factors acting as barriers to financial inclusion. These barriers according to the study included distance from the residence to banks, transaction costs. Documentation required lack of the trust on the part of financial institutions and lack of money on the part of households.

Mago and Chitokwindo (2014) examined the impact of mobile banking on financial inclusion in Zimbabwe, using a well structured questionnaire made up of 270 respondents sampled from four districts: Chivi, Bikita, Gutu and Masvingo. The study employed the descriptive statistics and found that the adoption of mobile banking has enhanced the level of financial inclusion in Zimbabwe. According to the result, low income people are willing to adopt mobile banking due to the reasons that it is easily accessible, convenient, cheaper, easy to use and secure.

In another study, Joseph and Varghese (2014) sought to establish the developmental influence of financial inclusion in the Indian economy. The investigation was carried out on five state banks and five private banks. The study employed descriptive statistics such as simple tables and percentages were used in analyzing data such as growth rate of the number of banks branches, offsite and in-site Automated Teller Machine (ATM), debit card usage and credit card usage were analyzed. The analysis of the study showed that the number of functioning branches of commercial banks has tremendously increased during the 2009 and 2013 period. For instance, rural bank branches rose from 31476 in 2009 to 37953 in 2013, with the growth rate averaging 20.58 per cent. The number of functioning branches of commercial banks in the semi-urban areas also increases from 19126 branches in 2009 to 27219 branches in 2013, with the overall growth rate averaging 42.31 percent. The number of urban branches also showed significant improvement in terms of growth in the number of branches as bank branches rose from 15273 in 2009 to 1937 branches in 2013. In the same vein, metropolitan bank branches in 2013, with the average growth rate of 24.57 percent. Analysis of the overall growth in the number of bank branches showed that total commercial banks branches rose from 8,826 in 1969 to 59,762 branches in 1990 and more rapidly to 1,02,343 branches in 2013.

Analysis of ATM usage revealed that there has been tremendous use of ATM across the study area for example, ATM usage in the state Bank of India were from 1328 in June 2013 to 15475 in November 2013, representing the growth rate of 16.99 percent. Card use in the state Bank of Travancore also rose from 314 in June 2013 to 340 in November, 2013 representing 8.28 percent growth rate. In the same manner ATM usage in the HDFC Bank Ltd increased from 6564 in June 2013 to 6694 in November 2013, denoting 1.98 percent growth rate. Number of ATM usage in Axis Bank Ltd also increased from 9102 in June 2013 to 9596 in November, 2013, indicating 5.43 percent growth rate. Lastly number of debit card usage in south Indian Bank Ltd rose from 211 in June 2013 to 228 in November, 2013. Based on the analysis, the authors submitted that financial inclusion has significant impact on the economy of India during the evaluation period.

Model specification

This model is anchored on financial innovation theory. The innovation – growth view holds that financial innovation impacts positively on economic growth. Within this view, it is held that financial innovation has capability of raising the efficient functioning of the process of financial intermediation by increasing varieties of financial services and products, which results to improved matching of individual savers needs with firms requiring funds, and the resulting capital accumulation leading to economic growth. Based on this theoretical postulation, there are many indicators of financial innovation. The various proxies for financial innovation as used by many authors (Mannah-Blankson and Belyne, 2004, King' Ori, 2003 and Arturo, 2001) include the ratio of M2 to M1, real interest rate, bank asset/GDP ratio, and number of ATMs. In addition to the indicators of financial innovation, this study also captures domestic investment, which acts as a control variable in the model. The financial innovation – economic growth nexus equation can be expressed in expanded form functionally as follows:

$$GDPC = f(GDI, M2/M1, RIR, BAY, ATMVO) \quad 1$$

Where:

GDPC = per capita gross domestic product in naira, representing a measure for economic growth

GDI = gross domestic Investment in Nigeria, represented by gross fixed capital formation. This is measured in millions of naira

BAY = bank assets to GDP ratio (in percent)

M2/M1 = broad money supply relative to narrow money supply (in percent)

RIR = real interest rate (in percent)

ATMVO = volume of ATM transactions (in millions)

The econometric specification of equation 3.1 can be written as follows:

$$GDPC = \beta_0 + \beta_1 GDI + \beta_2 BAY + \beta_3 M2/M1 + \beta_4 RIR + \beta_5 ATMVO + U_1 \quad 2$$

The logarithmic specification of equation 1 is as follows.

$$\text{LOG}(GDPC) = \beta_0 + \beta_1 \text{LOG}(GDI) + \beta_2 BAY + \beta_3 M2/M1 + \beta_4 RIR + \beta_5 \text{LOG}(ATMVO) + U_1 \quad 3$$

Where: β_0 to β_5 depicts the designated parameters that the study is finding magnitudes to and U_1 is the stochastic error term.

The expected signs to be carried by the parameters as advanced by the theoretical postulation go thus: $\beta_1 > 0$, $\beta_2 > 0$, $\beta_3 > 0$, $\beta_5 > 0$, and $\beta_4 < 0$.

Gross domestic investment is expected to influence economic growth positively. Improvement in domestic investment raises the productive capacity of the economy which leads to economic growth. Hence, β_1 should be positive.

Bank assets to GDP should also have a positive coefficient (i.e. β_2) because the larger the assets of a bank, the more it is able to mobilize savings for investment and hence increase in economic growth.

In a similar manner, the ratio of broad money to narrow money should have a positive impulse on economic growth. The larger the ratio of M2 to M1, the higher will be the degree of financial innovation in the form of increased monetization. An increased monetization provides a strong financial requirement for investment and hence increases in economic growth. Hence, β_3 is expected to be positive.

However, real interest rate should exert a negative impact on economic growth. This is because a high real interest rate discourages borrowing which reduces investment and hence reduction in economic growth.

Lastly, the coefficient of volume of ATM transaction should be positive. This is because an increase in the volume of ATM transactions means an increase in financial innovation, which brings about high level of financial deepening and thus leads to an increase in economic growth. Hence, β_5 is expected to be positive.

ANALYSIS OF RESULT AND DISCUSSION OF FINDINGS

Unit root test

The outcome of unit root tests for determining the stationarity condition of the concerned variables are reported in tables 1 and 2. The tests were carried out using the Augmented Dickey-Fuller (ADF) test and Philips-Perron (PP) test.

TABLE 1: Augmented Dickey-Fuller (ADF) test

Variable	ADF statistics		Remarks
	Level	First difference	
LGDPC	-2.2623	-2.9203	I (1)
LGDI	-0.8516	-6.4654	I (1)
BAY	-1.2579	-5.6561	I (1)
LM2MI	-0.1767	-7.6524	I (1)
ATMVO	-0.3566	-10.42	I (1)
RIR	-2.1593	-7.409	I (1)
Test critical value at level: 1% = -3.495677, 5% = -2.890037			
Test critical value at first difference: 1% = -3.495677, 5% = -2.890037			

Source: Researcher's computation, 2023

TABLE 2: Philips-Perron (pp) test

Variable	PP Statistics		Remarks
	Level	First Difference	
LGDPC	-2.55558	-5.335191	I (1)
LGDI	-0.70058	-5.676681	I (1)
BAY	-1.47675	-6.249691	I (1)
LM2MI	-2.10531	-12.13232	I (1)
ATMVO	-0.31381	-10.42776	I (1)
RIR	-2.14892	-7.116640	I (1)

Test critical value at level: 1% = -3.490210, 5% = -2.887665

Test critical value at first difference: 1% = -3.490772, 5% = -2.887909

Source: Researcher's computation, 2023

The outcome of the unit root tests deploying both the Philips-Perron (pp) test and Augmented Dickey-Fuller (ADF) test as reported in tables 1 and 2 showed that no variable was stationary at level. This was so because the Philips-Perron (PP) tests and the Augmented Dickey-Fuller (ADF) tests calculated statistics values at level were all smaller in magnitude in absolute term than the tests tabulated value at the five percent significance level. Based on this result, the study couldn't discard the null hypothesis of no unit root in the variables. But at their first differencing process, the variables were found to be stationary and hence were integrated of order I (1). The fact that the stationarity of the variables was established after first differencing means that the various specifications for this study would be estimated in their difference form.

Cointegration test

The unit root test in the preceding section showed that the variables were integrated of the order I(1). This implies that even being individually non-stationary; a linear combination among the variables is suspected. In other words, it means that there is possibility of long run association among them. To ascertain the occurrence of the long run association amidst the captured variables, the cointegration test has to be conducted. The cointegration test was conducted using the Johansen and Juselius (1990) multivariate approach. The cointegration test employed the maximum eigenvalue test and the trace test. The outcomes of the co integration enquiry are demonstrated in table 3 and table 4.

TABLE 3: Trace test for cointegration

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.367034	117.7631	95.75366	0.0007
At most 1	0.215728	68.82792	69.81889	0.0598
At most 2	0.168041	42.82701	47.85613	0.1368
At most 3	0.114435	23.14205	29.79707	0.2391
At most 4	0.082653	10.13842	15.49471	0.2702
At most 5	0.008446	0.907557	3.841466	0.3408

Source: Researcher's computation, 2023

TABLE 4: Maximum eigenvalue test for cointegration

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.367034	48.93520	40.07757	0.0039
At most 1	0.215728	26.00092	33.87687	0.3207
At most 2	0.168041	19.68495	27.58434	0.3633
At most 3	0.114435	13.00364	21.13162	0.4519
At most 4	0.082653	9.230859	14.26460	0.2674
At most 5	0.008446	0.907557	3.841466	0.3408

Source: Researcher's computation, 2023

The results of co-integration enquiry as presented in tables 3 and 4 showed that there was the existence of one co-integrating equation using the two test statistics (the maximum eigenvalue statistic and the trace statistic). This means that the computed test (i.e. maximum eigenvalue and the trace) statistic value in each of the co-integrating equation exceeded the critical value at five percent significance level. Based on this outcome, the study concludes that there existed a long run association among the variables in the model. This means that despite the fact that the variables were non-stationary individually, but when the variables were linearly combined, they were then stationary.

TABLE 5: Parsimonious result of financial services – economic growth nexus

Dependent Variable: DLGDPC

Method: Least Squares

Date: 01/09/23 Time: 09:09

Sample (adjusted): 1987Q3 2021Q4

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.030282	0.005539	5.466804	0.0000
DLGDPC(-1)	0.420920	0.087710	4.798997	0.0000
DLGDI	0.012998	0.013910	0.934468	0.3523
DLM2M1	-0.160710	0.077424	-2.075718	0.0405
DBAY	-2.315149	0.230217	-10.05639	0.0000
DBAY(-1)	0.981502	0.307170	3.195302	0.0019
DRIR	0.000412	0.000440	0.935055	0.3520
DRIR(-1)	-0.000603	0.000432	-1.395351	0.1660
DATMVO	0.015368	0.004604	3.337786	0.0012
ECM1(-1)	-0.345886	0.128585	-2.689941	0.0024
R-squared	0.696513	Mean dependent var		0.049929
Adjusted R-squared	0.669200	S.D. dependent var		0.058606
S.E. of regression	0.033707	Akaike info criterion		-3.855705
Sum squared resid	0.113617	Schwarz criterion		-3.610206
Log likelihood	222.0638	Hannan-Quinn criter.		-3.756129
F-statistic	25.50043	Durbin-Watson stat		1.989748
Prob(F-statistic)	0.000000			

Source: Researcher's computation, 2023

Before the Parsimonious error correction specification was estimated, the statistically significant variables in the over-parameterized estimate were picked and used in estimating the parsimonious error correction result. The results of the parsimonious error correction specification are presented in table 5. Analysis of the parsimonious short run dynamics revealed that the estimated regression line has a moderately high explanatory power because of the R-squared of 0.696 and the adjusted R-squared of 0.669. Specifically, the adjusted R-squared of 0.669 demonstrated that about 67 percent of the entire changes in the regressand (that is, the dependent variable) was attributed to changes in the regressors (that is, the independent variables). The model therefore has a high explanatory ability.

The high value of F-statistics of 25.50 confirmed that the entire estimated model was statistically significant at the five percent significance level. The significance of the entire specification is due to the fact that the computed F-statistic value of 25.50 has exceeded the critical f-value of 2.10 at the five per cent significance level. The entire model being statistically significant implied that the regressors demonstrated joint impulse on the regressand. The joint impact of the regressors on the regressand demonstrated the existence of a very high extent of linear association between the regressors and the regressand.

The Durbin-Watson value of 1.99 fell in the no autocorrelation region of the Durbin-Watson critical regions. This showed that there was no case of autocorrelation in the estimated equation and that the residual terms are not interdependent. This means that the equation estimated is well-behaved and its findings can be employed and relied upon for policy purposes in Nigeria.

With its negative and significant coefficient, the error correction factor turned up as expected. The numerical magnitude of the ECM's coefficient of 0.346 indicated clearly that approximately 35 percent of the disequilibrium in the short run specification was corrected every quarter. The ECM's coefficient of 0.346 illustrated a slow pace of adjustment process from the disequilibrium in the short time period to equilibrium condition in the long time period.

Evaluation of the short run coefficients demonstrated gross domestic product per capita in the past one period demonstrated a significant direct influence on the gross domestic product per capita in the current period. This inference is concomitant with expectations theoretically, showing that an increase in one period lagged of gross domestic product per capita by one percent culminated in an increase in the current period's gross domestic product per capita by 0.42 percent, *ceteris paribus*. As well, the variable (one period lagged of gross domestic product per capita) was significant statistically at the five percent levels of significance. This is because its zero (0.0000) probability value was less than 0.05.

The result also depicted that there is a direct impulse of gross domestic investment on gross domestic product per capita in Nigeria. The outcome was concomitant with expectation, indicating that when gross domestic investment increases by one percent, gross domestic product per capita will increase by 0.01 percent, *ceteris paribus*. The outcome indicated that the variable was not statistically significant at the five percent significance level because its p-value of 0.3523 was greater than 0.05. This means that an increase in accumulation of capital stock increases level of gross domestic investment, which in turn resulted to a rise in the overall output of an economy. This inference was in agreement with the postulation of neoclassical and endogenous growth theories that increased accumulation of capital stock leads to an increase in capital accumulation. An increase in the gross domestic capital accumulation resulted to a rise in gross domestic investment which ultimately culminated to an increase in the level of economic growth in Nigeria.

The ratio of broad money to narrow money has a significant negative relationship with gross domestic product per capita in Nigeria. The outcome was not in concomitant with expectation expounds by theory. This outcome indicates that a one percent rise in the ratio of broad money to narrow money culminated into a decline in gross domestic product per capita by 0.16 percent, *ceteris paribus*. The examination of the outcome confirmed that broad money relative to narrow money was statistically significant at the five percent significance level. This is so because its p-value of 0.0405 was less than 0.05. The implication of this result is that there is greater proportion of currency held outside the banking system in total narrow money stock. Hence, in spite of the effort at narrowing the proportion of currency held outside the banking system in total narrow money stock, it seems many Nigerians still prefer to hold physical cash instead of patronizing the banking sector. For this reason, the banking system is unable to mobilize more funds by way of savings which can be channeled into investment for economic growth to be achieved.

Similarly, one period lagged of bank assets to GDP ratio (an indicator of financial innovation) exerted a significant direct influence on gross domestic product per capita in Nigeria. The result is consistent with theoretical expectation expounded by financial innovation hypothesis which holds that financial innovation result to financial sector development which culminated in the increase in bank asset in Nigeria. The result in real terms showed that a rise in one period lagged of bank assets to GDP (financial innovation variable) by one percent culminated to a rise in gross domestic product per capita by 0.98 percent, *ceteris paribus*. This variable was also identified to bring about significantly impact on gross domestic product per capita in Nigeria for the examination period at the five percent significance level. This is because their p-values of 0.0000 and 0.0019 were all less than 0.05.

The positive relationship between the ratio of bank assets to GDP showed that the financial innovation in the banking sector has resulted to an increase in the asset level of deposit money banks in Nigeria. A rise in the ratio of bank asset to GDP leads to an increase in financial deepening. A rise in financial deepening brings about an increase in investment which eventually culminated to a rise in economic growth. Statistics have shown that the ratio of bank asset to GDP has been fluctuating since the reform of the financial sector in 1986. For instance, the ratio of bank asset to GDP was 47.36 per cent in 1987. It then fluctuated between 16.97 per cent and 33.50 per cent from 1988 1999 and then fell consistently from 47.56 per cent in 2000 to 30.98 per cent in 2005. The ratio of bank asset to GDP climbed from 38.64 per cent in 2006 to 70.67 per cent in 2009 but fluctuated between 30.86 per cent and 59.34 per cent from 2010 to 2014 (CBN, 2014).

Real interest rate exerted a positive association with gross domestic product per capita in Nigeria. The outcome is consistent with the McKinnon and Shaw financial liberalization thesis, showing that a rise in real interest rate by one percent brought about a rise in per capita gross domestic product by 0.0004 percent, *ceteris paribus*. Real interest rate did not significantly impact on the regressand at the five percent significance level. This is because its p-value of 0.3520 was greater than 0.05. According to McKinnon and Shaw (1973) financial liberalization thesis, a rise in real rate of interest should trigger a rise in real investment, particularly more risky businesses with possibility of high returns. An increase in real interest rate ultimately brought about a rise in real investment which ultimately leads to expansion in economic growth.

Lastly, volume of automated teller machines (ATMs) has a significant direct influence on gross domestic product per capita in Nigeria. The outcome of this examination was concomitant with a priori exposition, showing that when the volume of automated teller machines (ATMs) transactions increase by one percent, per capita gross domestic product will increase by 0.02 percent, *ceteris paribus*. This variable also demonstrated a significant influence on GDP per capita during the period of analysis. This is because its probability value of 0.0012 was less than 0.05. So, as the number of ATMs increase, the larger will be the volume and value of its transactions.

This result means that an increase in the volume of ATM transaction showed that more and more Nigerians have embraced financial innovation by keying into electronic payment system in Nigeria. Also an increase in the volume of ATM transactions enhances the effectiveness of the payment system, which in turn leads to economic growth. Statistics have showed that volume of ATM transaction has been on the increase over the years. For instance, the volume of ATMs rose from 12.5 million in 2006 to 60.1 million in 2008. The volume of ATMs further increased from 60.1 million in 2008 to 109.2 million in 2009 but fell sharply to 60.1 million in 2010. The volume of ATMs thereafter increased sharply to 347.6 million in 2011 and further to 375.5 million in 2012 but fell briefly to 295.3 million in 2013. By 2014, the volume of ATMs rose to 400.1 million (CBN, 2014).

Summary

The thrust of this empirical examination was to evaluate the impact of financial inclusion on economic growth in Nigeria. In order to accomplish this research study, the ordinary least squares (OLS) estimation technique was employed within the framework of cointegration analysis, granger casualty test and the error correction mechanism (ECM). The study also conducted stationarity tests by employing the use of the Augmented Dickey-Fuller (ADF) and the Philips-Perron (PP) unit root tests.

Based on the result of the analysis, the study made the following summary of findings.

Financial innovation indicators such as ratio of bank assets to GDP, real interest rate and volume of ATM transactions impacted positively on economic growth in Nigeria for the covered period. On the other hand, broad money relative to narrow money exhibited an inverse relationship with economic growth in Nigeria. Other results of this specification demonstrated that one period lagged of gross domestic product exerted a direct influence on economic growth in the current period in Nigeria. Finally, gross domestic investment exhibited a direct impact on economic growth in Nigeria.

Policy recommendation:

The positive impact of real interest rate and interest rate spread on economic growth calls for the attention of the Apex bank to direct commercial banks to increase savings deposit rate and reduce lending rate. An increase in savings deposit rate will attract more savings to the banks which could be channeled into investment purposes. On the other hand, a reduction in lending rate will make borrowing cheaper and encourage borrowing for investment ventures. The increase in the level of investment will in turn resulted to an improvement in the level of economic growth

Conclusion

This research exercise was undertaken to unravel empirically the impact of financial inclusion on economic growth in Nigeria. In Nigeria, the financial system has undergone series of reforms over the course of time aimed

at repositioning it for optimal performance, which could ultimately culminate to economic growth. The reforms in the financial system have also brought about emergence of new products and services.

With the emergence of mobile telecommunication and internet services in recent years, the financial system has bubbled with flurry of products and services including the use of electronic payment through ATMS, POS, internet, mobile payment transaction among others.

Prior to efforts at financial inclusion, many views described the Nigerian economy as being cash-based in nature with the greater proportion of its narrow money stock held as cash outside the banking system. In recent times, the Nigerian apex bank has doubled efforts at promoting financial inclusion which is witnessed in the introduction of new innovations in the form ATM, POS, mobile banking, internet banking and inter-bank transactions, hence the motivation for this study. The eminent research question behind this study is; does financial inclusion and innovation have any significant impact on economic growth in Nigeria? The inference derived from the estimation of these research equations demonstrated that financial inclusion and innovation have positive linkages with economic growth in Nigeria for the period under evaluation.

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