Research Article
Volume 14:1, 2025

Journal of Business & Financial Affairs

ISSN: 2167-0234 Open Access

Financial Intermediation and its Effect on Nigeria Sustainable Development: An Empirical Analysis

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Abstract

Despite the promising future of financial inclusion brought about by the widespread use of financial technologies, a number of obstacles persist. One way to accomplish this financial innovation goal is to be receptive to the many different approaches to financial intermediation. Therefore, the study investigates the impact of financial intermediation indicators on Nigeria's Gross Domestic Product (GDP). The findings offer that the positive coefficient for Bank Branches (BB) suggests that expanding bank branches significantly promotes economic growth. Bank Rural Loans (BRL) and Bank Rural Deposits (BRD) positively affect GDP, emphasizing the importance of rural finance in fostering economic development. Notably, Loans to Small Scale Enterprises (LSSE) have a strong positive coefficient; highlighting that improving credit access for Small and Medium-sized Enterprises (SMEs) can drive substantial GDP growth. This underscores the need to support SMEs, contributing to job creation and poverty reduction. However, the study also reveals that Interest Rates (INTR) negatively impact GDP, necessitating revaluating branch expansion strategies in high-interest rate environments. Conversely, an appreciating Exchange Rate (EXR) is linked to GDP growth, which is crucial for rural deposits and SMEs engaged in foreign transactions. The recommendations made will help the policymakers.

Keywords: Financial intermediation • Sustainable development • Small-scale enterprises • Interest rates • Exchange rates

Introduction

By facilitating the availability of funds (and the implementation of access) for investment and economic reasons, the target of financial inclusion is to propel the economy to greater growth and development indices [1]. By collecting and utilizing these assets, investors gain access to a vast pool of low-cost, long-term investing money. It entails integrating the shadow banking system into the regular economy. Nwafor and Yomi emphasized that the majority of the population lives in low and middle-income brackets and, as a result, controls almost all of the economy's inactive funds; however, had held in small volumes by each of the several million members of this group, thus, harnessing and amassing these resources offers a massive basis of cheap long-term investable capital [2]. In economies that haven't fully embraced financial inclusion, many people's money ends up in the unregulated informal economy, where it can do more harm than good to both the community and the person. The lack of financial inclusion pushes the unbanked into the informal banking industry, which has high-interest rates and limited cash available to individuals.

Evidence has shown that 80.4% of the financially excluded individuals lived in rural areas. The lack of financial inclusion can lead to persistent income inequality and slower economic growth. The possibility of creating a sizable depository of savings, investable money, investments, and subsequently the creation of global wealth would be made possible by granting access to the millions of people who are currently denied access to financial services. Therefore, to reduce the number of Nigerians who are excluded from financial services, the CBN and other stakeholders are currently implementing the National Financial Inclusion Strategy (NFIS), as reported by Ibor et al. Only 36% of Nigeria's adult populace, which places it third behind South Africa and Kenya, has access to physical cash payments, according to the CBN's 2018 report. This is true even though the financial sector of the nation is growing. The goal of the Nigerian Financial Inclusion Strategy (NFIS) is to ensure that all adult Nigerians can easily access various high-quality, low-cost formal financial services. Across the world, including Nigeria, the inclusion of finance has emerged as a major policy concern. It is now seen as a means of eradicating poverty and achieving equitable growth in the economy. Growth in the economy is a way of increasing a country's

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Received: 22 November, 2023, Manuscript No. JBFA-24-120796; **Editor assigned:** 24 November, 2023, PreQC No. JBFA-24-120796 (PQ); **Reviewed:** 08 December, 2023, QC No. JBFA-24-120796; **Revised:** 23 January, 2025, Manuscript No. JBFA-24-120796 (R); **Published:** 31 January, 2025, DOI: 10.37421/2167-0234.2025.13.780

actual Gross Domestic Product (GDP). Growth can be measured by looking at the growth of real GDP or Gross National Product (GNP) during that period [3].

According to the evidence, effective financial services can help increase household welfare and stimulate small business activity. Additionally, there also exists macroeconomic evidence suggesting economies with more financial intermediation expand quickly and have lower income inequality. This supports the role of institutions in the process of financial intermediaries. The banking sector's initiative to bridge diverse strata of society, regions, genders, and incomes and encourage the public to embrace banking habits can help to meet the aims of financial inclusion.

However, the correlation between interest rates and GDP is widely acknowledged in academic literature. Interest rates are employed by central banks as a mechanism to manage inflation and modulate the pace of economic expansion or contraction [4]. A decrease in interest rates typically leads to an increase in borrowing and investment, hence potentially fostering economic growth as measured by GDP. On the other hand, it is worth noting that elevated interest rates have the capacity to curtail both borrowing and expenditure, so potentially impeding the pace of economic expansion [5].

A significant correlation exists between interest rates and the exchange rate of currencies. High interest rates have the potential to entice foreign capital inflows in search of greater investment returns, thus resulting in an appreciation of the native currency [6]. On the contrary, a decrease in interest rates has the potential to deter foreign investment, leading to a devaluation of the currency. The impact of exchange rates on a nation's export competitiveness and balance of trade has been discussed by Mishkin [7].

Financial intermediation plays a pivotal role in bolstering economic activity and fostering GDP growth. The monetary policies implemented by central banks have a significant impact on various economic factors, including borrowing, spending, and investment. These policies, particularly the determination of interest rates, have an influence on both the Gross Domestic Product (GDP) and exchange rates. The impact of exchange rates on a nation's trade balance, in turn, has the potential to exert an influence on its Gross Domestic Product (GDP). The aforementioned relationships exhibit dynamism and are influenced by a multitude of external and internal factors that contribute to the economic success of a nation.

The goal of the study is to draw attention to the damaging effects of financial exclusion on the economy and to offer regulators, analysts, and financial and economic planners' insightful analysis and useful recommendations for dealing with this problem.

Previous empirical research has mostly focused on the relationship between financial inclusion indicators and economic growth, whereas there has been less investigation into their association with inclusive growth, as measured by the Real Gross Domestic Product (RGDP). For instance, Afolabi conducted a study that revealed a positive and statistically significant relationship between financial inclusion, specifically in the form of rural loans, financial institution branches, level of liquidity, and inclusive growth. Similarly, Enueshike and Okpebru corroborated these findings by demonstrating that Small and Medium Enterprise Loans (SMEL), Rural Bank Deposits (RBD), and Inflation (INF) have a significant impact on economic growth in Nigeria [8]. Uruakpa, et al. conducted a study in which they found that the presence of deposits in rural branches of commercial banks and the volume of e-banking transactions have a substantial and positive influence on economic growth [9]. In contrast, the study revealed that loans provided by rural branches of industrial banks have a limited and negligible impact on the financial development of Nigeria. The findings of several authors indicate a lack of consensus and inconclusive results. Moreover, other research studies have been conducted to examine the relationship between financial inclusion and economic growth in Nigeria.

The aim of this research is to expand knowledge and examine the immediate and long-term effects of financial inclusion and inclusive growth in Nigeria between 2001 and 2020. This is attained through assessing the effects of Branch branches (BB), Branch Rural Loans (BRL), Branch Rural Deposits (BRD), Interest rates (INT), and exchange rates on economic growth. The effect of financial inclusion on economic growth has been extensively studied in the past, but the role of real gross domestic product, interest rates, and exchange rates has not been extensively studied. Therefore, it is vital to come up with a state-of-the-art paper that ascertains the association of these factors with sustainable growth. Therefore, the originality and research contribution of the present study can be explained in three ways. Firstly, this research adds to the body of literature on the effect of financial mediation on economic growth in Nigeria. Secondly, the research assesses the influence of commercial banks rural deposit and lending activities in the big economy, Nigeria. The research adds to the present empirical evidence that is available from a few past researches by ensuring that a study that specifically considers second biggest economy in Africa after South Africa, undertaken to ascertain the link between rural deposit and lending rates on economic growth. Thirdly, the current research examines the effects of real gross domestic product, interest rates and exchange rates, an association that has not been widely done despite that a few available researches indicate that. Therefore, the results presented in this empirical research are strong, robust, and reliable for use in making policies. The research questions that are answered in this research are given as follows:

- What is the effect of an increase in bank branches on economic growth in Nigeria?
- What effect do commercial bank rural deposits have on growth in Nigeria's economy?
- What effect does commercial bank rural lending have on economic growth in Nigeria?
- To what extent do interest and exchange rates have an influence on economic growth in Nigeria?

The present research presents the literature review and methods in the next section, after which the results and discussion will be presented and finally the conclusion.

Literature Review

Theoretical review

This study is based on the theory of finance growth in order to examine the hypothetical framework. This theory believes that financial development creates a conducive environment for growth through either a "supply-driven" or "demand-driven" effect. This hypothesis also acknowledges the lack of access to financial resources as a fundamental issue responsible for persistent income disparity and slow economic growth. Therefore, the provision of a secure, convenient, and cost-effective means of obtaining resources is acknowledged as a prerequisite for revitalizing progress and reducing income disparities and poverty, thereby creating equal opportunities. This enables individuals who are economically and socially marginalized to better integrate into the economy, actively participate in development efforts, and safeguard themselves against economic fluctuations.

One of the primary challenges encountered in achieving financial inclusion in Nigeria pertains to the notably low level of financial literacy, particularly among rural residents. This poses considerable obstacles for financial service providers in facilitating banking and other financial transactions. Furthermore, it is worth noting that the level of information and telecommunication understanding remains inadequate within the nation, hence posing challenges in terms of accessing financial services. Similarly, the availability of data and media transmission information remains limited in the country, hence impeding access to financial inclusion. The lack and inadequacy of mindfulness campaigns in many contexts impede the understanding of financial transactions and the ability of inexperienced individuals to capitalize on potential opportunities in financial services. At the core of mindfulness lies the differentiation between the vernacular used by the general public and the specialized language employed in educational settings, which consequently hampers the efficacy of communication. According to Afolabi, the successful utilization of financial services is hindered by an uninformed and inexperienced population, as highlighted by Migap et al. [10].

This idea holds significance in the context of these studies as it posits that facilitating convenient access to financial services for both rural and urban populations can greatly contribute to fostering economic growth through the effective implementation of financial inclusion.

Financial intermediation in Nigeria

Low understanding, the limited availability of these wireless payment products, and a general lack of trust are all factors that have prevented full financial inclusion from being achieved. Despite the promising future of financial inclusion brought about by the widespread use of financial technologies, Nguling'wa argues that a number of obstacles persist. Among these include the low saving and poor loan repayment culture, the high and persistent levels of financial illiteracy, the high lending rates that lead to a substantial difference between lending and deposit rates, and the limited reach of the brick-and-mortar model, especially in rural areas. One way to accomplish this goal is to be receptive to the many different approaches to financial inclusion. Nigeria has long been a poster child for financial exclusion, with the vast majority of the country's wealth remaining unbanked until the arrival of digital banking. Because of this, the topic of financial exclusion has been given serious thought by numerous governments throughout history. According to the World Bank, involuntary exclusion should be the focus of policy and research efforts because it can be remedied through the implementation of suitable economic programs and policies that raise wages, lessen poverty, close gaps in income inequality, and repair flaws in the functioning of markets. Historically, the Nigerian economy relied heavily on unbanked cash transactions, with a sizable amount of the narrow money supply held in unofficial currency. Although the average ratio of Currency held Outside of Banks (COBs) to narrow Money supply (M) declined from 61.1 percent 1 in the 1960's to 44.3 percent 1 in the 1970's and then to 40.9 percent 1 in the 1980's, the value was still relatively high given the expansion of the narrow money supply. Increased literacy and government measures aimed at fostering growth in the financial industry were also contributors to the drop in the percentage. During this time, the CBN launched the rural banking project, instructing banks to open branches in rural regions and thereby increasing Nigerians' access to and use of financial services. People lost faith in banks when a major crisis hit the sector in the 1990's. The situation was made worse by the rise in the supply of currency held outside of banks, which was caused by the political class's lavish spending. By the end of the '90's, the proportion of currency held outside of banks had risen to 47.7 percent.

Increased usage of formal financial services led to a 38%drop in the informal sector's share of the economy by year's end of 2005. Financial exclusion levels in Switzerland, the United States, Venezuela, Nigeria, Pakistan, India, and Argentina were compared over 45 years (1960-2005) by researcher Martin Oluba, using the same measure of the ratio of currency outside the banking system to narrow money supply. According to Anyanwu, et al. the end aim of financial inclusion appears to differ from country to country, and various commitments and policies have been in challenging form for execution. He concluded that Nigeria had not done too poorly in absolute terms, but that the exclusion rate needed to be lowered more quickly. The National Financial Inclusion Strategy (NFIS) was implemented in Nigeria in 2012, and it has been touted as a crucial factor in the country's rise to the status of one of the world's largest economies by Omojolaibi. By 2020, NFIS hopes to have reduced the percentage of people in Nigeria who lack access to financial services from 46.3% to 20%. The percentage of the Nigerian population with access to financial services rose from 36.3 percent in 2010 to 43.3 percent in 2012, 48.6 percent in 2014, and stayed at that level in 2016,

while the percentage of the population with bank accounts rose from 30 percent in 2010 to 32.5 percent in 2012, 36.5 percent in 2014, and 38.5 percent in 2016. Between 2010 and 2016, the formal other increased by 10.3 percentage points. This sector includes financial institutions such as microfinance banks, insurance companies, pension funds, and similar service providers. The percentage of the economy that is made up of the informal sector (such as NGOs and credit unions) fell from 17.4 percent in 2010 to 9.8 percent in 2016. The primary objective is to analyze how financial inclusion contributes to GDP expansion in Nigeria. Therefore, the researchers broke down financial inclusion to look at how different factors, such as the number of commercial bank branches, the amount of currency in circulation, the amount of currency held outside of banks, the amount of credit given by commercial banks to the private sector, loans, and deposits made at rural commercial bank branches, all affected economic growth in Nigeria.

Empirical literature

The study conducted by Enueshike and Okpebru investigated the impact of financial inclusion on the economic growth of Nigeria during the period spanning from 2000 to 2018. The variables were estimated using data obtained from the Central Bank of Nigeria Statistical Bulletin. The regression analysis examined the relationship between the dependent variable of financial inclusion, which was measured by the contribution of financial institutions to Gross Domestic Product (GDP), and the explanatory variables of Loans to Small and Medium Businesses (LSME) and Rural Bank Deposits (RBD). Additionally, the control variable of Inflation (INF) was included in the analysis. The study employed diagnostic tests to assess the presence of unit roots and co-integration. The results indicated that the variables exhibited mixed co-integration and demonstrated a long-term association, respectively. The statistical estimation of the relationship between the explained variable and the explanatory variables was conducted using an auto-regressive distributed lag model. The results obtained from Wald tests indicate that the variables Loan to Small and Medium Enterprises (LSME), Rural Bank Deposit (RBD), and Inflation (INF) have a statistically significant impact on economic growth in Nigeria.

The study conducted by Afolabi examined the impact of financial inclusion on inclusive growth in Nigeria, focusing on the time frame spanning from 1981 to 2017. The study used the Auto-Regressive Distributed Lag (ARDL) model, utilizing annual series data from the Central Bank of Nigeria (CBN) statistical bulletin and the World Development Indicators (WDI). The variables utilized in this study encompass rural loans, number of bank branches, money supply-GDP ratio, private sector credit to GDP ratio, and GDP per capita. The research discovered that the presence of rural loans, a higher number of bank branches, and a sufficient level of liquidity have a favorable and statistically significant impact on inclusive growth in both the short and long term. Conversely, the study revealed that interest rates hinder the progress of inclusive growth.

Nwafor and Yomi looked into how expanding access to financial services affected GDP growth in Nigeria. Two hypotheses were developed and tested using the two staged least squares regression method and collected data (from 2001 to 2016). There was a substantial correlation found between financial inclusion and GDP growth in Nigeria, and the results also showed that financial inclusion was unaffected by intermediation in the financial sector over the time frame under consideration. In order to boost Nigeria's GDP per capita and economic growth, it was suggested that Nigerian banks create financial products to reach the financially excluded sections of the country.

In order to better understand the connection between microfinance and financial inclusion in Nigeria, Adeola and Evans conducted research [11]. To obtain the best estimates of cointegrating regressions and guarantee the robustness of the parameter estimates to various specifications, the study used two different regression methods, the Fully Modified OLS (FMOLS) and the Dynamic OLS (DOLS). The authors used annual data for the years 1981-2014, which included the total loans and advances made by commercial banks, the number of microfinance institutions in Nigeria, the GDP, and lending interest rates. A number of long-term connections between microfinance and financial inclusion were found in the study. While the study discovered that microfinance had a short-term, positive but negligible impact on financial inclusion, it also discovered that microfinance had a long-term, positive, and statistically significant impact on the degree of financial inclusion. Additionally, both in the short and long terms, negative interest rates had a statistically significant effect on the degree of financial inclusion.

Anyanwu, Ananwude, and Nnoje conducted an analysis of the impact of microfinance bank products on rural women's economic independence through rent savings, child education, newborn, and daily savings accounts. To do this, they used a descriptive survey strategy. One hundred and ninety (190) out of a total of two hundred (200) surveys were returned with complete responses. The research concluded that microfinance institutions should focus more on developing products specifically for women. This will provide them access to numerous options from which to select the ones that are best suited to their requirements. Furthermore, community/social rather than individual collateral should be required for women to get money from these microfinance institutions.

In 2014, Fadun looked into how financial inclusion might help developing countries, especially Nigeria, reduce poverty and redistribute income. The study highlighted Nigeria's financial inclusion strategy, which aims to reduce the proportion of Nigerians without access to financial services, and it examined international efforts to promote financial inclusion. According to the findings, financial inclusion is a crucial tool for lowering poverty and redistributing income in developing nations, especially in Nigeria. The study's practical implication is that financial sector stakeholders must work continuously to reduce the number of people who are denied access to financial services in order to reduce poverty and facilitate income redistribution in developing nations.

Conversely, some researchers have discovered an inverse correlation between financial inclusion and economic growth. The study conducted by Seven and Yetkiner examined the impact of financial inclusion on economic growth across countries with varying income levels. The findings revealed a noteworthy inverse association between financial inclusion and economic growth specifically in high-income nations. According to the research conducted by van Wyk and Kapingura, it has been determined that the impact of saving on economic growth in South Africa is negative over an extended period of time [12]. This can be attributed to the country's low level of domestic savings and its heavy dependence on foreign savings, which primarily manifest in the form of Foreign Direct Investment (FDI), Official Development Assistance (ODA), and cross-border bank flows.

The study conducted by Otiwu, Okoro, Uzowuru, and Ozuzu aimed to examine the correlation between financial inclusion and economic growth, specifically in regard to microfinance, throughout the time frame of 1992 to 2013 in Nigeria [13]. The research utilized the ordinary least square method and employed the Johansen cointegration tests to examine the long-term and short-term correlations among variables. The variable representing economic growth, namely gross domestic product, was utilized as a proxy. The explanatory variables consisted of total deposits mobilized by small and medium enterprises, total loans and advances provided to small and medium enterprises, the quantity of bank branches, and investment. The results of the study suggest that the impact of total deposits mobilized, number of bank branches, and investments on economic growth is not statistically significant. However, it is seen that total loans and advances have a statistically significant effect on economic growth.

The probability of having a bank account in Nigeria was examined in terms of income, education, age, gender, urban-rural classification, and access by Olubanjo [14]. More than 20,000 people were surveyed throughout 37 states in Nigeria between 2008 and 2016 for the study. The result revealed that being a woman, a young person, or residing in a rural region all have substantial negative consequences on people's access to financial services.

However, the literature review revealed that there aren't many published studies readily available online, which points to a research gap. While other studies reported a negative correlation or no significant impact, some of the studies reviewed found a significant positive correlation between financial inclusion and economic growth. Only a weak correlation between the variables was discovered in some studies. This lack of agreement among the authors suggests that there is no agreement regarding how financial inclusion will affect Nigeria's economic growth.

Furthermore, it is also clear that there aren't many studies in Nigeria that specifically examine the link between financial mediations combination variables (BB, BRL, BRD, LSSE, INTR, and EXT) and economic growth empirically. Instead, the majority of current research focuses on MSMEs' performance, poverty reduction, rural residents, microfinance institutions, gender inequality, and the efficiency of financial inclusion (Table 1).

Year	Banked	Formal-other	Informal	Financial excluded	Population of adult
2008	21.10% (18.27 m)	2.50% (2.17 m)	23.90% (20.70 m)	52.50% (45.62 m)	86.6 m
2010	30% (25.41 m)	6.30% (5.34 m)	17.40% (14.74 m)	46.30% (39.22 m)	84.7 m
2012	32.50% (22.57 m)	10.50% (9.23 m)	17.30% (15.21 m)	39.70% (34.9 m)	87.9 m
2014	36.30% (33.94 m)	12.30% (11.50 m)	11.90% (11.13 m)	39.50% (36.93 m)	93.5 m
2016	38.30% (36.92 m)	10.30% (9.93 m)	9.80% (9.44 m)	41.60% (40.10 m)	96.4 m
2018	39.70% (39.5 m)	9.00% (8.9 m)	14.60% (14.6 m)	36.80% (36.6 m)	99.6 m
2020	44.80% (47.6 m)	5.70% (6.0 m)	13.60% (14.6 m)	35.90% (36.6 m)	106 m

Table 1. The trend of financial intermediation in Nigeria 2008-2020.

According to the EFInA study, the data shown in the Table 1 above reveals an important lack of access to formal financial services among the adult population in Nigeria.

Table 2 presents an analysis of the level of financial inclusion among six nations in sub-Saharan Africa, illustrating the variations across them. The data indicates that in Nigeria, 45.0% of the adult population is formally banked, whereas 6.0% of the adult population has access to formal financial services and products that are not provided by Deposit Money Banks. Furthermore, it is worth noting that around 14.0% of the adult population engages in the utilization of unregulated financial organizations, such as cooperative societies and savings clubs. The percentage of individuals within the population

who lacked access to formal financial services was found to be 36.0%.

Country	Banked	Formal B	Informal-other	Financial excluded
Nigeria	45.00%	6.00%	14.00%	36.00%
Kenya	44.00%	39.00%	6.00%	11.00%
Rwanda	36.00%	41.00%	16.00%	7.00%
Uganda	22.00%	36.00%	20.00%	22.00%
Tanzania	13.00%	52.00%	7.00%	28%
Cameroun	10.00%	39%	15%	36%

Table 2. The trend of financial intermediation cross-country comparison in sub-Saharan Africa for 2020.

Materials and Methods

Research design

The research design used is the ex-post facto so as to ensure the data is not altered. Ex-post facto research is significant, according to Asika, who claims that it uses pre-existing data to provide a systematic and empirical solution to research issues. The researcher can set up a scenario to generate the necessary data for analysis even though the data used are not in the researcher's direct control. However, due to the quantitative data, the regression method was used to objectively verify the effect of financial inclusion on GDP growth. A simple regression equation was employed following one dependent variable and independent variables. The national bureau of statistics of Nigeria as well as the CBN statistical bulletin edition and annual reports were used as secondary data sources for this study. Documentary evidence was also used to support the findings. The historical time-series data set, obtained from these secondary sources, contains information on financial inclusions such as the number of bank branches, commercial bank lending to rural areas, commercial bank rural deposits, commercial bank loans to small-scale enterprises, and total private sector credits. Real GDP and financial inclusion data are also included. In order to learn more about the exogenous variables, this study also includes control variables like exchange and interest rates. To do this, a modified linear regression model was estimated and used. The financial inclusion model might be defined as follows, in line with the aforementioned discussions in the literature:

$$RGDP=f(BB, BRL, BRD, LSSE, INT, EXR) \quad (1)$$

The equation provided above will now be deconstructed in the subsequent analysis below:

The equation for Real Gross Domestic Product Growth Rate (RGDPGR) can be represented as follows:

$$RGDPt=\beta_0+\beta_1 BBt+\beta_2 BRLt+\beta_3 BRDt+\beta_4 LSSEt+\beta_5 INTt+\beta_6 EXRt+\mu \quad (2)$$

Where;

RGDP=Real Gross Domestic Product

BB=Number of Bank Branches

BRL=Bank Rural Deposit

LSSR=Loans to Small Scale Enterprises

IR=Interest Rates

EXR=Exchange Rate

μ=Error term

β_0–β_6=The parameters

A prior expectation=$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6 > 0$.

Results and Discussion

The dataset utilized in this research comprises various variables, namely the Number of Bank Branches (BB), Bank Rural Lending (BRL), Bank Rural Deposits (BRD), Loans to Scale Enterprises rural banks' loans (LSSE), Interest Rate (IR), Exchange Rate (EXR) and Real Gross Domestic Product (GDPR). The data spans the time period from 2001 to 2020. The time-series data presented involves several statistical tests; descriptive tests, normality tests, multiple regression tests, and robustness diagnostic tests. The robustness diagnostic tests included normality tests, multicollinearity tests using a correlation matrix, serial correlation tests using Durbin-Watson, and heteroscedasticity tests using Breusch-Pagan (Table 3).

	GDPR	BB	BRL	BRD	LSSE	INTR	EXR
Mean	60905.09	1759.474	109996.5	85637.34	30751.53	17.23784	179.4995
Median	54612.26	1303.000	27263.50	14861.60	17424.30	15.75000	150.3000

Maximum	144210.5	3492.000	868947.8	1096428	90176.50	42.61000	360.1300
Minimum	8134.140	1089.000	8942.200	19.70000	11307.80	10.51000	111.9400
Std. dev.	41989.22	827.3630	246057.5	247567.7	24336.99	7.138208	81.15168
Skewness	0.439909	0.984297	2.593899	3.860537	1.321418	2.471881	1.345856
Kurtosis	2.025171	2.437876	7.841082	16.30399	3.525257	9.535603	3.116213
Jarque-Bera	1.365128	3.318149	39.85988	187.3171	5.747881	53.16429	5.746563
Probability	0.505320	0.190315	0.000000	0.000000	0.056476	0.000000	0.056513
Sum	1157197	33430.00	2089934	1627109	584279.0	327.5190	3410.490
Sum Sq. dev.	3.17E+10	12321533	1.09E+12	1.10E+12	1.07E+10	917.1721	118540.7
Observations	20	20	20	20	20	20	20

Table 3. Descriptive test results.

The descriptive results presented above provide insights into the performance of the research variables over the studied period. Real Gross Domestic Product (RGDP) has a mean of 60,905.09 and a standard deviation of 41,989.22, indicating a significant variation in GDP over the studied period. This is further supported by the maximum and minimum values of 144,210.5 and 8,134.14. The positive skewness of 0.43 and platykurtic value of 2.02 suggests that there are fewer major fluctuations in the time-series data.

The Bank Branches (BB) data series also showed significant fluctuations, with an average of 1,759.474 and a standard deviation of 827.36. This is evidenced by the maximum and minimum values of 3,492 and 1,089, respectively. However, it has a positive skewness (of 0.98) and a platykurtic value of 2.43. The implication of this is that there is less major fluctuation within the period of observations.

The Bank Rural Loans (BRL) has a mean and std. dev. of 109,996.5 and 246,057.5 respectively, means a dramatic rise in the BRL over the observation period. This is confirmed by the max and min values of 868,947.8 and 8,942.20 respectively. The variable is positively skewed (2.59) and has a leptokurtic value of 7.84 which indicates that there has been a remarkable fluctuation in the data series within the observed period.

In addition, the Bank Rural Deposits (BRD) has an average of 85,637.34 and a standard deviation of 247,567.7. The data is positively skewed at 3.86 and has a leptokurtic value of 16.30 which attests to the variable of the data distribution.

The Loans to Small Scale Enterprises (LSSE) shows a mean and a std. dev. value of 30,751.53 and 24,336.99 which means there is a noteworthy variation from the mean as supported by the max., and min. values of 90,176.50 and 11,307.8. The variable is positively skewed (1.32) and has a leptokurtic value of 3.52 which indicates that there is less major fluctuation within the observed period.

Evidence from the Interest Rate (INTR) shows a mean of 17.23 and a std. dev. of 7.13. This means there is a little variation. The data is positively skewed (2.47) with a leptokurtic value of 9.53. The EXR has an average value of 179.49 and std. dev. value of 81.15 which means that there is a remarkable variation in the data distribution. With a positively skewed value of 1.34 and a leptokurtic value of 3.11, it is pertinent to assert that there is a major fluctuation in the data distribution. Determining whether the data follow a normal distribution or not is crucial given the type of data used in this study. We utilized the Jarque-Bera test, which gives researchers more latitude in adjusting for the effects of time-specific variables, to test for normalcy. In this test, the alternative hypothesis is that the data are not regularly distributed, whereas the null hypothesis asserts that they are. When the p-value is less than 0.05, we reject the null hypothesis; when it is greater than or equal to 0.05, we accept it (Table 4).

	RGDP	BB	BRL	BRD	LSSE	INTR	EXR
Jarque-Bera	1.365128	3.318149	39.85988	187.3171	5.747881	53.16429	5.746563
Probability	0.505320	0.190315	0.000000	0.000000	0.056476	0.000000	0.056513

Table 4. Time-series normality test.

It is obvious from the normality test result that, with the exception of RGDP, BB, and LSSE, almost no variables have a p-value less than 5% and, for the presence of abnormality in the variables data distribution, it is agreed that the probability value (p-value) should be less than 0.05. Therefore, it is clear from the information above that the variables (BRL, BRD, INTR, and EXR) do have p-values that are less than 5%, indicating that they have an abnormal distribution, as opposed to the RGDP, BB, and LSSE, which have p-values that are greater than 5%, indicating that they have a normal distribution. Therefore, it is validly accepted that (hypothesis), all the variables are not regularly distributed. The variables are subsequently normalized using logarithmic conversion.

To verify the fundamental OLS assumption, the Jarque-Bera method was employed to test the assumption of normality. Because the Jarque-Bera method is specifically designed for OLS and includes an asymptotic test, it is preferred above other techniques. Although the model appears to be well dispersed in the results, the researcher ignored it because it had no impact on how the estimated equation turned out. As a result, based on the results of the Jarque Bera normalcy test, the variable's mean values are lower than the forecasted median value. The coefficient of the symmetry (skewness) of the total variable is favorably skewed to the right towards normality, given the fact that the standard deviation is frequently high and shows the volatility of the data used in the research process. The entire variable of kurtosis, on the other hand, is roughly 3, indicating that they are all mesokurtic in nature. Because the Jarqu-bera probability value is greater than the 5% significance level, all the variables employed in the research procedure are considered to be normally distributed.

Regression coefficients

Basically, the inferential studies are conducted to investigate the relationships between the dependent variable (economic growth, represented by gross domestic product) and the (primary) independent variable (financial inclusion, proxied by BB, BRL, BRD, LSSE, INTR, and EXR). To achieve this, multiple regression and correlation using the ordinary least square method are thought to be adequate and are thus used. From the OLS result (presented below), a positive coefficient value of 0.1473 and a p-value of 0.00 are present for the Bank Branches (BB). This means that if its value increases by a certain amount and all other factors remain the same, the GDP will climb by 14.73%. As a result of these findings, the aforementioned null hypothesis is disproved. Therefore, the study concludes that the expansion of bank branches has a major impact on Nigeria's economic development. This result is in accordance with the findings of Otiwu, et al. and is backed up by the finance-growth theory, however, it is in opposition to the results of Uruakpa, et al. This finding aligns with the research conducted by Nkwede, which suggests that the proliferation of bank branches significantly influences the economic growth of Nigeria. Meanwhile, the result is opposed to the study of Collins that despite the growth of financial services in recent years, there is a lack of concrete evidence demonstrating a positive impact on the overall well-being and per capita income of the general population [15]. Conversely, this phenomenon contributes to the accumulation of wealth within a few groups of affluent individuals, who promptly expend their financial resources. Furthermore, the impact of the proliferation of bank accounts on savings remains inconclusive, given the inherent challenge of accurately forecasting consumers' utilization of their income [16].

A positive coefficient value of 0.1267 and a p-value of 0.00 are also present for the Bank Rural Loans (BRL) variable. This means that if its value increases by a certain amount while all other factors remain the same, the GDP will climb by 12.67%. This analysis concluded that commercial bank rural lending has a major impact on Nigerian economic growth since it cannot accept the null hypothesis. The result aligns with the research conducted by Wakdok [17], however, it contradicts the findings of Nwafor, et al. as well as Uruakpa, et al.

The Bank Rural Deposits (BRD) has a positive coefficient value of 0.0666 with a p-value of 0.01 in a similar vein. This means that if its value increases by a certain amount while all other factors remain the same, the GDP will climb by 6.66%. Therefore, this analysis argues that commercial bank rural deposits have a considerable impact on Nigeria's economic growth, validly rejecting the null hypothesis. These results are supported by the finance-growth theory, which contends that providing universal access to financial services in rural as well as urban settings can considerably contribute to encouraging economic growth by means of the effective implementation of financial inclusion. This result aligns with the outcomes reported by Enueshike, et al.; Nwafor, et al. and Wakdok.

The Loans to Small Scale Enterprises (LSSE) has a positive coefficient value of 0.5649 and a p-value of 0.00, which is much more significant. This means that if its value increases by a certain percentage, other factors being the same, the GDP will increase by 56.49%. This finding is consistent with the research findings of Enueshike, et al. as well as Otiwu, et al. Furthermore, the findings underscore the need of proactive initiatives undertaken by financial institutions and regulatory bodies in order to enhance and streamline the accessibility of loan services for Small and Medium-Sized firms (SMEs). By engaging in this endeavor, individuals possess the capacity to foster the progress and enlargement of these institutions, which often play a crucial role in generating employment possibilities and mitigating poverty.

However, the INTR shows a negative coefficient value of -0.2165 with a p-value of 0.543, indicating that a percentage increase in INTR will result in a loss in GDP of 21.65% while leaving other factors constant. This observation is consistent with well-established economic theories that suggest that elevated interest rates have the potential to discourage borrowing and expenditure. Consequently, this can result in a decline in overall economic activity [18]. Nevertheless, the presence of a negative coefficient linked to Interest Rates (INTR) implies that an increase in interest rates could potentially have an adverse effect on GDP. Within the Nigerian banking sector, it may be inferred that the persistence of elevated interest rates may engender a decline in both borrowing and lending endeavors. Consequently, it is imperative for banks to conduct a thorough evaluation of their branch growth strategy, taking into account the possible dampened demand for loans and financial services in an environment characterized by elevated interest rates. Thus, in a high-interest-rate environment, rural borrowers in Nigeria may encounter difficulties in obtaining affordable credit due to the inverse correlation between interest rates and GDP. Nigerian financial institutions may benefit from investigating creative ways to enhance the accessibility and affordability of loans for rural communities. This could involve the implementation of reduced interest rates for loans in rural areas or the provision of support for financial inclusion projects targeting disadvantaged populations.

EXR has a positive coefficient value of 1.1679 and a p-value of 0.06, indicating that its rise will cause the GDP to increase by 116.79 while maintaining other variables constant. According to the study conducted by Olawore et al. the presence of a positive coefficient linked

to Exchange Rates (EXR) suggests the possibility of an increase in GDP when the exchange rate strengthens. This phenomenon has the potential to incentivize rural communities to engage in saving and depositing their funds, especially if they hold the belief that a more robust exchange rate will result in enhanced economic circumstances. Nigerian financial institutions have the potential to leverage this opportunity by strategically extending their reach into rural regions and introducing competitive savings and deposit offerings to entice rural customers. Moreover, Small and Medium-sized Enterprises (SMEs) frequently depend significantly on loans and engage extensively in overseas transactions. The results indicate that fluctuations in interest rates and exchange rates can have a substantial impact on the operational activities of businesses. The imposition of high-interest rates has the potential to elevate borrowing expenses for individuals or entities, but the presence of advantageous exchange rates can influence the competitiveness of their exports. It is recommended that Nigerian banks undertake the customization of financial goods and services to cater to the unique requirements of Small and Medium-sized Enterprises (SMEs). This may involve the provision of cost-effective loan packages and foreign currency services, which can assist SMEs in effectively managing the obstacles they encounter Iheke et al. (Table 5) [19].

Variable	Coefficient	Std. error	t-statistic	Prob.
C	4.813149	2.164895	2.223271	0.0533
BB	0.147339	0.771098	3.191077	0.0027
BRL	0.126674	0.08273	4.531173	0.0001
BRD	0.066612	0.037044	4.798166	0.0057
LSSE	0.564911	0.372113	4.518114	0.0033
INTR	-0.21647	0.334711	-0.64672	0.534
EXR	1.167917	0.53271	2.192408	0.056

Table 5. OLS results.

Diagnostics tests

Some diagnostic tests were carried out to make sure that the empirical result was reliable and valid. For multicollinearity, heteroskedasticity, and autocorrelation, the diagnostic test was carried out. The Variance Inflation Factor (VIF) was used to check if there is multicollinearity in the model, the white heteroskedasticity test was used to test for heteroskedasticity, and the Breusch-Godfrey LM test was used to test for the presence of autocorrelation in the model (Table 6).

	Coefficient	Uncentered	Centered
Variable	Variance	VIF	VIF
C	4.686771	3365.765	NA
BB	0.594593	4480.469	10.32951
BRL	0.006844	102.0233	1.531618
BRD	0.001372	13.02749	1.745864
LSSE	0.138468	1934.656	7.514280
INTR	0.112032	122.0536	1.723392
EXR	0.283780	955.5968	1.892185

Table 6. Multicollinearity test-Variance Inflation Factor (VIF).

In Table 6, all of the VIF components in the regression model are below the benchmark of 10, the table above demonstrates that all of the variables are pertinent to the study. This demonstrates that the model does not have multicollinearity.

Serial correlation test

A diagnostic test called the Lagrange Multiple (LM) test is used to determine whether serial correlation is present or absent in order to shield the model from inaccurate results (Table 7).

Breusch-Godfrey serial correlation LM test			
F-statistic	1.712269	Prob. F (2,10)	0.2481
Obs*R-squared	5.256118	Prob. *Chi-Square* (2)	0.0722

Table 7. Breusch-Godfrey **serial correlation LM test.**

With p-values of 0.25 and 0.07, indicating that there is no autocorrelation in the model. As a result, we may say that the model does not contain any autocorrelation (Table 8).

Heteroskedasticity test: Breusch-Pagan-Godfrey			
F-statistic	2.49776	Prob. F (6,12)	0.1049
Obs*R-squared	9.996638	Prob. *Chi-Square* (6)	0.1248
Scaled explained SS	3.716551	Prob. *Chi-Square* (6)	0.715

Table 8. Heteroskedasticity **test.**

The heteroskedasticitytest result indicates that the residuals or error term may be unstable, which may have an impact on the inferences. With p-values of 0.10 and 0.12, respectively, shown in Table 6, there is no heteroskedasticity in the model because they are greater than the crucial values at the 5% level of significance. Therefore, we can conclude that the model is heteroskedasticity-free.

Ramsey RESET test

The broad specification of the linear regression model is tested using the statistical technique known as the RESET test. It evaluates whether adding nonlinear combinations of fitted values can provide a more comprehensive explanation for the response variables (Table 9).

	Value	df	Probability
t-statistic	0.539130	11	0.6045
F-statistic	0.290661	(1, 11)	0.6045
Likelihood ratio	0.571011	1	0.4499

Table 9. Ramsey RESET test.

Table 7, revealed that p-values of 0.6045 shown in the model are correctly described because they are higher than the critical values at the P>0.05 significance level. We can draw the conclusion and suggest that the model was unable to account for any other factors outside financial inclusion. Therefore, the paper undoubtedly concludes that there is no statistical evidence of the occurrence of autocorrelation (or the likelihood of independent error terms influencing the dependent variables of the study) as the Schwarz and Hannan-Quinn criterion values are roughly the same [20]. Thus, the findings suggest that the regression model as a whole is statistically significant, reliable, and appropriate. This implies that there is a positive and insignificant link between dependent and independent factors, which is implicitly explained by all independent variables. In conclusion, the model was correctly specified and there was no misspecification.

Conclusion

In summary, this study offers significant contributions to the understanding of the interconnections among financial inclusion, interest rates, exchange rates, and economic growth within the context of Nigeria. The coefficient value of 0.1473, which is positive, and the low p-value of 0.00 indicate a statistically significant relationship between the increase in bank branches and Nigeria's economic growth. This suggests that the expansion of bank branches can have a substantial positive impact on the country's economy. The presence of a positive coefficient value of 0.1267, accompanied by a p-value of 0.00, suggests that the expansion of rural lending by commercial banks has a significant and favorable effect on the economic growth of Nigeria. The coefficient value of 0.0666 with a positive sign and a p-value of 0.01 indicates a statistically significant relationship between rural deposits in commercial banks and Nigeria's economic growth, which aligns with the finance-growth theory. The most important finding of this study is the remarkable coefficient value of 0.5649 and a p-value of 0.00, suggesting that enhancing loan accessibility for Small Scale Enterprises can lead to a considerable increment in GDP. The presence of a negative coefficient value of -0.2165 and a relatively high p-value of 0.543 suggests that there is evidence to support the notion that an increase in interest rates could potentially lead to a decrease in GDP. This finding aligns with established economic theory. Based on the obtained results, it can be inferred that a strengthening exchange rate, as shown by a positive coefficient value of 1.1679 and a p-value of 0.06, is associated with a potential increase in GDP. The results indicate that the promotion of

financial inclusion, the provision of support to Small and Medium-sized Enterprises (SMEs), and the prudent management of interest rates and currency rates are crucial factors in achieving sustainable economic development. Although the current body of literature provides backing for these conclusions, it is imperative to take into account the distinct economic landscape of Nigeria when devising policies and strategies pertaining to financial inclusion and economic advancement.

Recommendations

In light of the research findings, a number of policy recommendations can be put up.

To enhance financial inclusion, it is imperative for policymakers and financial institutions to provide precedence to endeavors that seek to broaden access to financial services. This should primarily involve facilitating greater availability of loans for Small Scale Enterprises (SSEs) and providing assistance for rural lending and deposit activities.

Advocate for the promotion of small and medium-sized firms (SMEs) by fostering proactive measures to enhance their access to credit opportunities. This can be achieved through the provision of loan packages and foreign currency services that are specifically designed to cater to the distinctive requirements of SMEs, while also being cost-effective.

Interest rate management is a crucial task for policymakers and central banks since it necessitates careful consideration and alignment with prevailing economic conditions. The influence of high-interest rates on borrowing and lending activity necessitates careful consideration of their effects on economic growth.

When analyzing exchange rates, there are several factors that need to be taken into consideration. These factors can have a significant impact on the value of a currency in relation to others. The objective is to observe and analyze the fluctuations in exchange rates and their influence on economic variables, with a specific focus on the mobilization of rural deposits and international transactions of Small and Medium-sized Enterprises (SMEs). Develop and execute plans aimed at effectively leveraging the potential advantages associated with a stronger exchange rate.

In general, the aforementioned policy ideas are designed to establish a favorable setting that promotes financial inclusivity and fosters sustained economic expansion inside Nigeria.

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How to cite this article: Henry, Ponle. "Financial Intermediation and its Effect on Nigeria Sustainable Development: An Empirical Analysis." *J Bus Fin Aff* 14 (2025): 770.