FINANCIAL SECTOR DEVELOPMENT, FINANCIAL ACCESS, AND ECONOMIC DEVELOPMENT IN NIGERIA IN THE PRESENCE OF STRUCTURAL BREAKS

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ABSTRACT

This study investigates the effect of financial sector development and financial access on economic growth in Nigeria from 1981 to 2023. It utilizes economic growth and human capital development as indices of economic development, the Zivot and Andrews unit root test to take into account structural breaks in financial sector development, and the Auto-Regressive Distributed Lag (ARDL) model. The results reveal that financial sector development only affects economic growth in Nigeria in the long run, while its structural break only impacts economic growth in the short run. Financial sector development and its structural break also only affect human capital development in the short run, while the impact of financial access on human capital development is limited to the short run. Based on these results, the study recommends that the CBN carry out a review of its financial development and access policies to take into account the infrastructure challenges in the country, while improving the coverage of its financial literacy programmes.

JEL classification: O16, O10 and G20

1. Introduction

Nigeria is currently categorized as a developing country. The country has maintained this status since it gained political independence in 1960, in spite of the wide range of policies and programmes introduced by the government

over the years at both federal and state levels. The measures introduced have included policies and policy reforms aimed at promoting the development of the financial sector, and increasing the level of financial access in the country. Such measures with respect to the promotion of financial sector development include the institution of the Securities and Exchange Commission in 1979 and its strengthening via the Securities and Exchange Commission Decree of 1989, institution of the second-tier securities market in 1985, institution of the Nigeria Deposit Insurance Corporation (NDIC) in 1988, introduction of the Bank and Other Financial Institutions Act in 1991 and its amendment in 1997, 1998 and 1999, introduction of the Central Securities Clearing System (CSCS) in 1992. A Central Bank Act was also introduced in 2005. The Central Bank of Nigeria (CBN) also carried out a bank consolidation exercise between 2004 and 2005 (Ogujiuba & Obiechina, 2011). Others include the adoption of universal banking in 2001, establishment of the Asset Management Corporation in 2010, and the institution of sustainable banking principles in 2011.

On the other hand, the drive towards promoting increased financial access has been pursued through policies such as the National Financial Inclusion Strategy (NFIS) in 2012 and spearheaded by the Central Bank of Nigeria, introduction of a framework for the supervision and regulation of non-interest financial institutions in 2011, and micro-finance policy in 2005. Others include the introduction of the revised national microfinance policy framework in 2011, introduction of the regulatory framework for the activities of agent banks in Nigeria initially as guidelines permitting partnership between financial institutions and third parties to provide basic banking services in 2013 and the issuance of broad guidelines regulating the agent banking activities on the 6th of October 2025, and introduction of the Anchor Borrowers' Programme (ABP) in 2015 (Abiodun, 2025; Atta, 2011; Ikpoto, 2024; Isern et al., 2009; Lloyd & Robbins, 2014; Sanusi, 2012).

The emphasis on the development of the financial sector has been based on government's recognition of the importance of a well-developed financial sector to efficient allocation of resources and thus, promotion of increased investment, employment, income, economic growth and development. The promotion of increased financial access has also been based on its role in

promoting the reduction of unemployment and poverty via the financial empowerment of individuals.

However, despite the aforementioned measures, and as earlier noted, Nigeria continues to be a developing country. The lack of economic development of the country is reflected in its relatively poor performance with respect to key development indices such as those of human capital development and economic growth. For instance, data on the human development index (HDI) from the United Nations Development Program (UNDP, 2025) reveals that Nigeria had an HDI score of 0.560 in 2023, relative to 0.571, 0.644, 0.710, 0.746, 0.754, 0.848 for Togo, Sao Tome and Principe, Morocco, Tunisia, Egypt, and Seychelles respectively, and 0.977, 0.970, 0.962 for Iceland, Norway and Germany.

The country also performs relatively poorly with respect to economic growth as an indicator of economic development. In this regard, data from the World Bank (2025a) reveals that the country had a growth rate of 2.9% in 2023, relative to 8.3%, 4.6%, 5.7%, 4.2%, 5.3%, 4.1%, 6.4%, 4.1%, 8.6% and 6.2% for Rwanda, Senegal, Sierra Leone, Somalia, Uganda, Algeria, Benin, Chad, the Democratic Republic of Congo, and Côte de Ivoire respectively.

In view of the foregoing, this study seeks to address five main questions, viz.: (i) What is the impact of financial sector development on economic growth in Nigeria? (ii) What is the impact of financial sector development on human capital development in Nigeria? (iii) What is the impact of financial access on economic growth in Nigeria? (iv) What is the impact of financial access on human capital development in Nigeria? (v) What is the impact of a structural break in financial sector development on economic growth and human capital development in Nigeria?

2. Literature Review

The importance of economic development to developing countries such as Nigeria has for long been non-contestable. It is reflected in the policy actions taken by developing countries over the years, with the attainment of economic development being the ultimate objective of macroeconomic policy in such countries. However, despite years of implementing a wide range of policies, a

significant number of such countries are yet to make significant strides with respect to the development of their economies.

The aforementioned continued lack of development of the economies of a significant number of developing countries has resulted in a wide range of studies being carried out to examine the factors which influence economic development in such countries with a view to providing recommendations which can be used to address such developmental challenges. Such studies have utilized a combination of a wide range of development indicators, ranging from the growth rate of gross domestic product (GDP) to per capita GDP, unemployment, human capital development and inequality. The studies have also considered the effects of a wide range of economic development drivers on economic development. These range from monetary and government expenditure variables, infrastructure, foreign remittances, foreign investment, to population dynamics, energy consumption, and environmental quality.

With respect to Nigeria, the study by Taheer et al. (2018) which utilized a static long-run model and a parsimonious short-run dynamics error correction model, and data for the period 1970 to 2015, found that total annual expenditure on defence, the interaction of defence expenditure and total social sectoral expenditure had statistically insignificant negative effects on economic growth in Nigeria in the short run, total social sectoral expenditure and gross capital formation had positive and statistically significant effects, while the effect of the interaction of total annual expenditure on defence and gross capital formation was statistically significant and negative during the same period. The study also found that the total annual expenditure on defence, the interaction of total annual expenditure on defence and gross capital formation and, interaction of defence expenditure and total social sectoral expenditure had negative and statistically significant effects on economic growth in Nigeria in the long run, while the effect of total social sectoral expenditure and gross capital formation was positive and statistically significant.

Another study by Musa (2019) which investigated the effect of foreign private capital on economic growth in Nigeria during the years 1986 to 2017 found that the previous year's foreign portfolio investment, previous years' foreign direct investment and previous years' economic growth had statistically significant positive effects on economic growth in Nigeria in the

long run, while the effects of remittances, capital formation, government expenditure, trade openness and the labour force were statistically insignificant. The study which utilized the Auto-Regressive Distributed Lag (ARDL) model also found that foreign portfolio investment, foreign direct investment, labour force, trade openness and capital formation had statistically significant positive effects on economic growth in Nigeria in the long run, government expenditure had a statistically significant negative effect on economic growth during the period, while the effect of foreign remittances was positive but statistically insignificant.

A similar study by Adeyonu and Ajudua (2024) found that remittances had a statistically significant negative long-run impact on economic growth in Nigeria in the long run. Trade openness had a positive and statically significant impact during the period, the impact of inflation was negative and statistically insignificant, while the effect of capital formation was positive and statistically insignificant. The study which utilized the Augmented-Dickey-Fuller unit root test and the Auto-Regressive Distributed Lag (ARDL) model also found that remittances had a negative and statistically significant effect on economic growth in Nigeria in the long run, while the effect of two-periods lagged capital formation and one-period lagged trade openness was positive and statistically significant.

On the other hand, Efayena and Olele (2023) examined the effect of the quality of the environment and corruption on economic growth in Nigeria between 1996 and 2021, employing the Augmented Dickey-Fuller unit root test and Non-Linear Auto-Regressive Distributed Lag (NARDL) model. The study found that the quality of the environment, measured as carbon dioxide emissions, had a negative and statistically significant impact on economic growth in Nigeria in both short- and long-run time periods.

Renewable electricity was found to have a statistically insignificant impact on human capital development in Africa, measured as the human development index, in the empirical study of the relationship between the consumption of renewable energy and human development in Africa, carried out by Osakede et al. (2024). The study which utilized panel data on 54 African countries for the period 2011 to 2023 and, the System Generalized Method of Moments (SGMM) estimator, and the Paris-Winsten regression with Panel Corrected Standard Errors (PCSE-WE) as a test for robustness, also found that access to

clean fuels and total renewable energy consumption as a percentage of the population had a statistically significant impact on human development in Nigeria.

Another study by Ighodaro (2021) which examined the relationship between the development of infrastructure and economic growth in 38 sub-Saharan African countries found that information and communication technology (ICT) infrastructure, measured as mobile cellular subscriptions and internet users had a statistically significant positive impact on economic growth in sub-Saharan Africa. The study, which utilized the fixed effects panel data model and data for the period 2000 to 2017, also found that electricity infrastructure had a positive but statistically insignificant effect on economic growth in sub-Saharan Africa.

In recent times, an increasing number of empirical literature on economic development has considered the development effects of financial sector-related factors such as financial development and financial access. Financial sector development and financial access influence the economic development indices of a country in several ways. Financial development fosters economic growth by increasing the level of savings, making available information on investment, promoting and enabling foreign capital inflow and efficiently allocating capital in a country, thus promoting the accumulation of capital and technological advancement (World Bank Group, 2026). Financial access enables households to better manage their finances, thus providing the basis for household investment in micro and small-scale economic activities which, given the importance of such enterprise in developing countries, boosts their growth process. Furthermore, both financial sector development and financial access facilitate the development of human capital by leading to increased enabling investment in human capital by households through spending on health and education on the one hand, and by the public and private sector through investment in health and educational services.

Given the link between financial development and financial access, and economic development indices, several studies have been carried out to examine the relationship between these variables. One such study by Iheanacho (2016) utilized the Autoregressive Distributed Lag (ARDL) model and data covering the period 1981 and 2011 to examine the effect of financial development on economic growth in Nigeria. The study which employed an

index of financial development, constructed using variables such as the ratio of bank deposits to the gross domestic product, liquid liabilities to GDP, domestic credit to the private sector to GDP, and deposit money bank assets to GDP, found that it had a negative but statistically insignificant effect on economic growth in Nigeria in the long-run, but a negative and statistically significant effect in the short-run. The study also found that the international price of crude oil had a positive and statistically significant effect on economic growth in Nigeria in both long and short-run time periods. The impact of investment and government consumption expenditure was statistically insignificant in the long and short runs, while trade openness had a positive but statistically insignificant impact on economic growth in Nigeria in the long run and a significant effect in the short run.

Another study by Akintola et al. (2020) investigated the impact of financial sector development on economic growth in Nigeria through the use of data covering the first quarter of 2000 up to the last quarter of 2019. The study which utilized the ARDL model found that financial sector development measures, such as financial deepening, short-term interest rate spread and all share index, had a positive and statistically significant effect on economic growth in Nigeria in the long run, while the impact of the exchange rate spread and market capitalization, as measures of the development of the financial sector, were negative but statistically significant during the same period. On the other hand, the study found that financial development measured as financial deepening and exchange rate spread had negative and statistically significant effects on economic growth in Nigeria in the short run. The effect of the all-share index, a measure of the development of the financial sector, was positive and statistically significant, the impact of market capitalization was negative but statistically insignificant, while the impact of the short-term interest rate spread was positive but statistically insignificant during in the short run.

A similar study by Anthony-Orji et al. (2023) utilized the data for the period 1981 to 2019 and the classical linear regression technique in examining the impact of financial inclusion and financial development on economic growth in Nigeria. The study found that both financial development and financial inclusion had positive and statistically significant effects on economic growth in Nigeria during the period covered by the study.

Adebayo (2025) utilized the Autoregressive Distributed Lag (ARDL) model in investigating the impact of the development of the financial sector on economic growth in Nigeria between 1981 and 2023. The study found that financial development, measured as the financial development index as constructed by the authors, had a negative and statistically insignificant impact on economic growth in Nigeria, measured as the logarithm of real gross domestic product (GDP), in both the long and short run time periods. The study also found that the ratio of government consumption expenditure to the GDP and ratio of trade to GDP had negative and statistically insignificant effects on economic growth in Nigeria in both time periods, while the effect of oil prices was positive but statistically insignificant. On the other hand, the total population had a positive and statistically significant effect on economic growth in Nigeria in both the long and short run time periods, while the effect of investment was negative and statistically insignificant during both time periods.

Another study by Ahamba et al. (2025) also used the ARDL model, in conjunction with the Toda-Yamamoto causality test in examining the relationship between the development of the financial sector and economic growth in Nigeria between 1981 and 2023. Financial development in Nigeria was measured through the use of four variables: financial efficiency, financial depth, financial access, and credit to the private sector. Economic growth was measured as the annual growth rate of the GDP. From the estimation of the ARDL model, the study found that previous years' credit to the private sector as a measure of the level of financial development in the previous year had a positive and statistically significant impact on economic growth in Nigeria in the current year in the short run, while the impact of the other measures of financial sector development was statistically insignificant during the same period. The study further found that credit to the private sector as a measure of the level of financial development had a positive and statistically significant long run effect on economic growth in Nigeria, while the effects of the other measures were statistically insignificant. The Toda-Yamamoto causality test results also revealed the presence of bidirectional causality between all measures of financial development and economic growth in Nigeria, except in the case of credit to the private sector for which no causal relationship was found.

A related study by Nenbee and Denwi (2025) evaluated the impact of export diversification and financial development on economic growth among 14 Economic Community of West African States (ECOWAS) countries. The study, which covered the period 1995 and 2022 and utilized the Panel Threshold Regression (PTR), found that export diversification had a negative and statistically significant effect on economic growth in the countries studied. The study further found that the effect of export diversification on economic growth in the study countries was statistically insignificant but positive where financial development, measured as the ratio of broad money supply to the gross domestic product, was below the threshold of 24.7814% export diversification (indicating a depressed financial system among ECOWAS countries), and statistically significant and positive when financial development was above the threshold of 24.7814%.

On the other hand, few existing studies focus on the impact of financial access on economic growth, with the available studies focusing on the financial inclusion effects. One study by Adenuga and Omotosho (2013) on the impact of financial access and financial depth on economic growth in Nigeria during the period 1975 to 2012, which was based on the use of the Error Correction Model (ECM), found that financial access measured as the ratio of population to banks had statistically significant negative effects on economic growth in Nigeria. A related study by Afolabi (2022) employed a non-linear approach, based on the use of the non-linear ARDL model in investigating the effect of financial development on human capital development in Nigeria between 1990 and 2019. The study measured human capital development using the United Nations Development Program`s (UNDP) Human Development Index (HDI), while financial development was measured using financial deepening reflected in variables such the ratios of credit to the private sector to GDP, money supply to GDP, bank penetration, and total bank deposits. From the results, the study found that all measures of financial development had statistically significant non-linear effects on human capital development in Nigeria during the period covered by the study.

Finally, the study by Afolabi et al. (2023) utilized the ARDL model in examining the relationship between financial development and human development in Nigeria between 1990 and 2019. The study also utilized the UNDP`s HDI as its measure of human development in Nigeria, while financial

development was measured using the ratios of market capitalization to GDP, credit to private sector to GDP, and money supply to GDP. From the analysis of data on the variables, the study found that financial development measures as the ratio of money supply to GDP had a positive and statistically significant effect on human development in Nigeria in both long and short run time periods, while the effect of previous years' ratio of money supply to GDP on human development in Nigeria was negative and statistically significant in the short run. On the other hand, the other measures of financial development were found to have statistically insignificant effects on human development in Nigeria in both long and short-run time periods.

From the review of empirical literature in this section, it can be seen that the existing studies on the impact of financial access on economic growth in Nigeria view such effects as a sub-set of the economic growth effects of financial inclusion. The exception to this is the study by Adenuga and Omotosho (2013). An examination of empirical literature also reveals the absence of studies which explicitly focus on the impact of financial access on human capital development in Nigeria.

Based on the orientation of the studies reviewed, the gap identified by this study is the lack of empirical studies on the relationship between the study variables which take into account the effects of structural breaks. In line with this, the study uses the Zivot and Andrews unit root test to identify the structural break in financial sector development in Nigeria. This is incorporated as a regressor in the study equations. The study also utilizes the International Monetary Fund's financial development index and access to financial institutions access index as measures of financial sector development and financial access.

3. Methodology

The study utilizes data on all the variables for the period 1981 to 2023. The data are derived from several sources including the Central Bank of Nigeria (2025), World Bank (2025b), Federal Reserve Bank of St. Louis (n.d.), and D.B Nomics (2023).

The methodology employed by this study is the Auto-Regressive Distributed Lag (ARDL) model. The study also employs the Zivot and

Andrews unit root test to take into account and identify structural breaks in the variables. Two equations are utilized in this study with respect to economic growth and human capital development as indices of economic development. The economic growth equation is anchored on the endogenous growth model and financial intermediation theory, while the human capital development equation is anchored on the financial intermediate theory.

The endogenous growth model developed by Paul M. Romer in 1990 emphasizes the role of technological progress as an endogenous factor in driving long-term economic development (Romer, 1990). Unlike exogenous growth models, such as the Solow model, Romer's framework posits that economic growth is driven by the accumulation of knowledge and innovation, which are generated through investments in human capital, research, and development. The model highlights three key themes: (1) the non-rivalrous nature of knowledge, which allows it to be used simultaneously by multiple agents without depletion; (2) increasing returns to scale in production due to knowledge spillovers; and (3) the role of institutions and policies in fostering innovation. Romer argues that economies grow by creating new ideas, which are facilitated by investments in education, research, and technological infrastructure, leading to sustained growth over time (Romer, 1990).

For this study on financial sector development, financial access, and economic development in Nigeria, the Romer model provides a direct theoretical anchor as financial sector development can be linked to the model's emphasis on investment in human capital and innovation, as a well-functioning financial system channels resources to research and development activities, fostering technological progress. Financial access, particularly for small and medium enterprises, enables the adoption of new technologies and entrepreneurial activities, which align with Romer's idea of knowledge creation driving growth. In Nigeria, where financial inclusion remains a challenge, the model suggests that policies enhancing access to credit and financial services could stimulate innovation and economic development. By facilitating investments in education and infrastructure, the financial sector can amplify knowledge spillovers, thereby promoting sustainable economic growth as envisioned in Romer's framework.

The second theory, the financial intermediation theory, which provides the theoretical anchor for both the economic growth and human capital

development equations, and which was primarily associated with the works of Gurley and Shaw in 1960, and later expanded by Levine in 1997, focuses on the role of financial institutions in reducing market frictions and facilitating economic growth. This theory emphasizes that financial intermediaries, such as banks and capital markets, enhance economic development by mobilizing savings, allocating resources efficiently, and mitigating risks. Key themes include: (1) the reduction of information asymmetries through screening and monitoring; (2) the provision of liquidity to support investment; and (3) the facilitation of risk diversification and management. By channelling funds from savers to borrowers, financial intermediaries lower transaction costs and improve capital allocation, thereby fostering productive investments and economic growth (Levine, 1997).

With respect to this study on financial sector development, financial access, and economic development in Nigeria, the financial intermediation theory is highly relevant. Nigeria's financial sector, characterized by limited access to credit and underdeveloped capital markets, can be analysed through this lens to understand how improvements in financial intermediation could drive economic growth. Enhanced financial access, particularly for underserved populations and small businesses, aligns with the theory's focus on mobilizing savings and directing them to productive investments. For instance, policies that strengthen banking institutions or promote mobile banking in Nigeria could reduce information asymmetries and increase liquidity, thereby supporting entrepreneurial activities and economic development. This theory complements the Romer model by providing a specific framework for understanding how financial sector reforms can catalyse the resource allocation needed for innovation and growth. Based on the theoretical frameworks discussed so far, the two equations upon which this study is based are specified in ARDL form as follows:

3.1 Economic growth equation

$$\Delta logRGDP_t = \alpha_0 + \sum_{i=1}^{q} \alpha_1 \Delta logRGDP_{t-1} + \sum_{i=1}^{q} \alpha_2 \Delta FSDV_{t-1} + \sum_{i=1}^{q} \alpha_3 \Delta logFNIA_{t-1} + \sum_{i=1}^{q} \alpha_4 \Delta logLABR_{t-1} + \sum_{i=1}^{q} \alpha_5 \Delta logGOVP_{t-1} + + \sum_{i=1}^{q} \alpha_6 \Delta logEXCE_{t-1} + \sum_{i=1}^{q} \alpha_7 \Delta logOPEN_{t-1} + \sum_{i=1}^{q} \alpha_8 \Delta DUMFSDV_{t-1} + \varphi ECT_{t-1} + \varepsilon_t \quad (1)$$

3.2 Human capital development equation

$$\Delta HCDE_t = \alpha_0 + \sum_{i=1}^{q} \alpha_1 \Delta HCDE_{t-1} + \sum_{i=1}^{q} \alpha_2 \Delta FSDV_{t-1} + \sum_{i=1}^{q} \alpha_3 \Delta logFNIA_{t-1} + \sum_{i=1}^{q} \alpha_4 \Delta logCESS_{t-1} + \sum_{i=1}^{q} \alpha_5 \Delta logINFA_{t-1} + \sum_{i=1}^{q} \alpha_6 \Delta logEXCE_{t-1} + \sum_{i=1}^{q} \alpha_7 \Delta IFLA_{t-1} + \sum_{i=1}^{q} \alpha_8 \Delta TEC_{t-1} + \sum_{i=1}^{q} \alpha_8 \Delta DUMFSDV_{t-1} + \varphi ECT_{t-1} + \varepsilon_t \quad (2)$$

where:

log*RGDP* = Economic growth measured as the logarithm of real gross domestic product

HCDE = Human capital development, measured as the index of human capital per person – a measure which, published by the Federal Reserve Bank of St. Louis, indicates the relative quality of Nigeria's labour force reflected in the average years of schooling and yield from education

FSDV = Financial sector development measured using the IMF's financial development index

DUMFSDV = Financial sector development dummy variable

FNIA = Financial access measured as the IMF's financial institutions access index

LABR = Labour force

GOVP = Fiscal policy measured as federal government expenditure

EXCE = Exchange rate measured as the naira-dollar exchange rate

OPEN = Trade openness measured as the ratio of the sum of imports and exports divided by the gross domestic product

INFA = Infrastructure measured as electricity supply

IFLA = Inflation

TEC = Technology measured as total factor productivity and

CESS = Federal government capital expenditure on social and community services.

4. Results and Discussion

The results of the estimation of the two study equations are presented in Tables 1 to 18. Also presented are the results of the pre- and post-estimation tests carried out on the equations.

4.1 Economic growth equation

Correlation testing was carried out through the use of the Pearson pairwise test for correlation (Table 1). The result reveals the existence of strong correlations between all the regressors included in the economic growth equation and economic growth in Nigeria with the exception of trade openness.

Table 1: Correlation Test

	LRGDP	FSDV	FNIA	LLABR	LGOVP	LEXCE	LOPEN	LINSQ
LRGDP	1							
FSDV	0.8014	1						
FNIA	0.8782	0.6834	1					
LLABR	0.9694	0.826	0.8723	1				
LGOVP	0.9385	0.7425	0.719	0.9171	1			
LEXCE	0.8751	0.6436	0.6203	0.8498	0.977	1		
LOPEN	0.2806	0.0614	-0.0427	0.1891	0.5194	0.5886	1	
LINSQ	0.8464	0.7912	0.8738	0.8446	0.6504	0.5551	-0.1355	1

Source: Authors (2025).

The test for unit roots with respect to the variables included in the economic growth equation was carried out through the use of the Zivot and Andrews unit root test. The results in Table 2 reveal that the variables included in the economic growth equation are of mixed order of integration. On this basis, the Autoregressive Distributed Lag (ARDL) model is employed as the estimator for this study. In doing this, a structural break dummy with respect to financial sector development (*DUFSDV*) is constructed on the basis of the structural break date of 2009 associated with it. The policies introduced in the years leading up to, and during this period include the bank consolidation exercise of 2004 to 2005, introduction of the Risk-Based Supervision Framework in 2006 and 2007, launching of the Financial Sector Strategy 2020 in 2007, and microfinance banking reforms of 2007. In particular, the period was characterized by the propagation of the effects of the global financial crisis of 2008 to 2009 and the CBN's response, reflected in its bailing out affected banks in Nigeria.

Table 2: Economic Growth Equation, Zivot and Andrews Unit Root Test

Variable	At Level		Structural Break Date	After First Differencing		Structural Break Date	Order of Integration
	Minimum t-statistic	5% Critical Value		Minimum t-statistic	5% Critical Value		
LRGDP	-3.248	-4.8	2002	-4.932	-4.8	2015	I(1)
FSDV	-3.623	-4.8	1987	-7.101	-4.8	2009	I(1)
FNIA	-7.694	-4.8	2008	-	-	-	I(0)
LGOVP	-2.771	-4.8	1989	-5.362	-4.8	2000	I(1)
LEXCE	-2.8	-4.8	1987	-6.166	-4.8	2001	I(1)
LOPEN	-5.253	-4.8	1987	-	-	-	I(0)
LINSQ	-3.692	-4.8	1989	-5.474	-4.8	1996	I(1)
LLABR	-7.015	-4.8	1990	-	-	-	I(0)

Source: Authors (2025).

The optimal lags used in the estimation of the ARDL model with respect to the economic growth equation were determined through the use of vector auto regression (VAR) lag selection criteria. The criterion utilized by this study is the Akaike information criterion (AIC) and it indicates that the optimal lags

for the estimation of the economic growth equation are 3 lags (Table 3). The results of the AIC are in agreement with the Final Prediction Error (FPE) and the Hannan-Quinn (HQ) information criterion.

Table 3: Vector Auto Regression (VAR) Optimal Lag Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	246.7810	NA	9.02e-16	-11.9391	-11.6013	-11.8169
1	544.8388	461.9896	7.94e-21	-23.6419	-20.60196*	-22.5428
2	604.7732	68.92452	1.45e-20	-23.4387	-17.6965	-21.3625
3	755.2710	112.8733*	6.83e-22*	-27.76355*	-19.3192	-24.71032*

Source: Authors (2025).

The result of the bounds test for cointegration with respect to the economic growth equation is presented in Table 4. From the result, it can be seen that the variables included in the equation are cointegrated, implying the existence of a long-run relationship between them. This is because the F-value of the test (8.236433) is greater than the critical values for the lower (2.17) and upper (3.21) bounds of the test at the 5% level of significance. On the basis of this, both short- and long-run versions of the economic growth equation are estimated.

Table 4: Autoregressive Distributed Lag (ARDL) Bounds Test for Cointegration

F-Bounds Test	Null Hypothesis: No levels relationship			
Test Statistic	Value	Significance	I(0)	I(1)
F-statistic	8.236433	10%	1.92	2.89
K	7	5%	2.17	3.21
		2.5%	2.43	3.51
		1%	2.73	3.9

Source: Authors (2025).

The short-run ARDL estimates of the economic growth equation are presented in Table 5. From the table, it can be seen that the one-year lag of economic growth in Nigeria had a statistically significant and positive impact on economic growth in Nigeria in the short run. Other years lags are statistically insignificant at the 5% level of significance.

The result also reveals that financial sector development does not significantly affect the growth of the Nigerian economy in the short run, despite its positive relationship with the growth of the economy during the period. On the other hand, the financial sector development structural break dummy variable has positive and statistically significant short-run effects on economic growth in Nigeria in, while the impact of its one-year lag is positive but statistically insignificant. It can also be seen that the labour force and its two-year lag have negative but statistically significant short-run effects on economic growth in Nigeria. This is also true of fiscal policy and its one- and two-year lags and, the one-year lag of the exchange rate. However, current year exchange rate had negative but statistically insignificant effects on economic growth in Nigeria in the short run, while the effect of the one-year lag of fiscal policy is negative and statistically significant. The error correction term is also correctly negatively signed and statistically significant. It indicates that 16.579% of the deviation from equilibrium in the previous period is corrected in the current period, though it also represents a slow speed of adjustment of economic growth in Nigeria to its long-run equilibrium.

Table 5: Short-Run Autoregressive Distributed Lag (ARDL) Model Estimates

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLOG(RGDP(-1))	0.306194	0.06774	4.520136	0.0002
D(FSDV)	0.223248	0.194972	1.145029	0.2664
D(DUFSDV)	0.048726	0.020201	2.412037	0.0261
D(DUFSDV(-1))	0.030956	0.017139	1.806212	0.0868
DLOG(LABR)	-0.41811	0.086241	-4.84811	0.0001
DLOG(LABR(-1))	-0.0231	0.090408	-0.25549	0.8011
DLOG(LABR(-2))	-0.35129	0.100471	-3.49645	0.0024
DLOG(GOVP)	-0.07464	0.019084	-3.91087	0.0009
DLOG(GOVP(-1))	-0.03768	0.015262	-2.46906	0.0232
DLOG(GOVP(-2))	-0.09143	0.015022	-6.08646	0.0000
DLOG(EXCE)	-0.00642	0.011194	-0.57319	0.5732
DLOG(EXCE(-1))	-0.03237	0.013052	-2.48045	0.0227
CointEq(-1)*	-0.16579	0.016154	-10.2635	0.0000
Adjusted R-squared		0.814773		
Durbin-Watson stat		2.265221		

Source: Authors (2025).

Furthermore, the adjusted coefficient of determination indicates that 81.4773% of the growth of the economy in the short run is explained by the statistically significant regressors in the growth equation, thus indicating that the model has a good fit. Finally, the Durbin-Watson result indicates the absence of auto-correlation among the residuals from the estimation.

The long-run estimates of the economic growth equation are presented in Table 6. From the result, it can be seen that financial sector development and the exchange rate had positive and statistically significant effects on economic growth in Nigeria in the long-run. On the other hand, the long-run growth effect of financial openness is negative and statistically insignificant. Other regressors in the equation, including trade openness, have statistically insignificant effects on the growth of the economy.

Table 6: Long-Run Autoregressive Distributed Lag (ARDL) Model Estimates

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FSDV	5.99513	2.830355	2.118154	0.0476
FNIA	-3.95355	5.553302	-0.71193	0.4852
DUFSDV	0.559975	0.409774	1.366546	0.1877
LOG(LABR)	1.044294	0.556025	1.878143	0.0758
LOG(GOVP)	-0.27077	0.182501	-1.48365	0.1543
LOG(EXCE)	0.295815	0.139801	2.11598	0.0478
LOG(OPEN)	0.331494	0.191986	1.726654	0.1005
C	-10.0545	10.12497	-0.99304	0.3332

Source: Authors (2025).

Several post-estimation tests were carried out on the estimates of the economic growth equation. The results of these tests, which include the Ramsey regression equation specification error test (RESET) in Table 7, Jarque-Bera test for normality (Figure 1), Breusch-Godfrey test for serial correlation (Table 8), Breusch-Pagan-Godfrey test for heteroskedasticity (Table 9), and the CUSUM test for parameter stability (Figure 2), all reveal that the equation is correctly specified, devoid of autocorrelation with its residuals being homoscedastic and normally distributed and characterized by stable parameters.

Table 7: Ramsey Regression Equation Specification Error Test (RESET)

	Value	Df	Probability
t-statistic	0.702791	18	0.4912
F-statistic	0.493915	(1, 18)	0.4912

Source: Authors (2025).

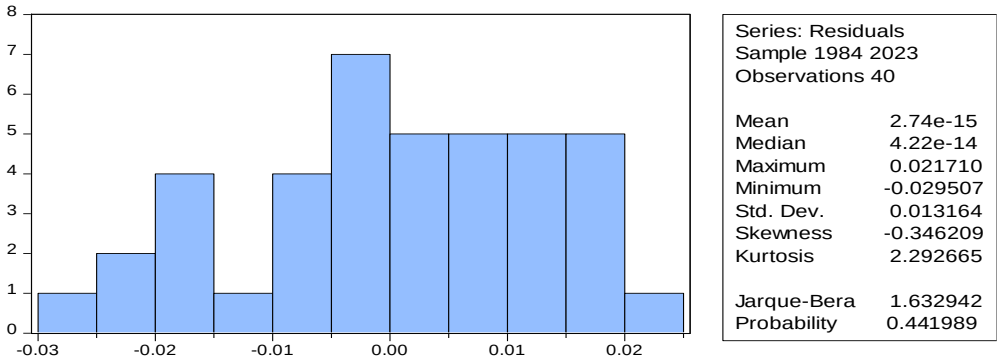

Figure 1: Jarque-Bera Test for Normality Result

Source: Authors (2025).

Table 8: Breusch-Godfrey LM Test for Serial Correlation

F-statistic	1.02962	Prob. F(2,17)	0.3784
Obs*R-squared	4.321766	Prob. Chi-Square(2)	0.1152

Source: Authors (2025).

Table 9: Breusch-Pagan-Godfrey Test for Heteroskedasticity

F-statistic	0.527362	Prob. F(20,19)	0.9178
Obs*R-squared	14.27848	Prob. Chi-Square(20)	0.8161
Scaled explained SS	2.082214	Prob. Chi-Square(20)	1

Source: Authors (2025).

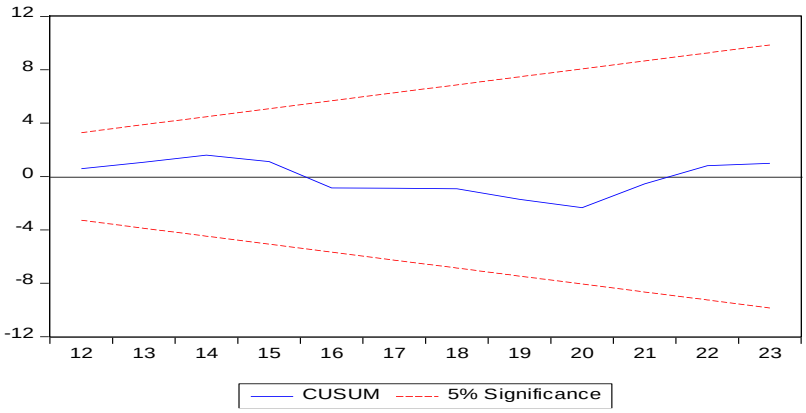

Figure 2: Cumulative Sum of Squares (CUSUM of Squares) Test for Parameter Stability

Source: Authors` (2025).

4.2 Human capital development equation

The results of the test for correlation are presented in Table 10. The results reveal the existence of a strong positive correlation between all the regressors and human capital development in Nigeria with the exception of inflation and technology.

Table 10: Correlation Test

	HCDE	FSDV	FNIA	LCESS	LEXCE	LINFA	IFLA	TEC
HCDE	1							
FSDV	0.8331	1						
FNIA	0.8563	0.6834	1					
LCESS	0.9422	0.7732	0.6942	1				
LEXCE	0.8917	0.6436	0.6203	0.9448	1			
LINFA	0.7536	0.5876	0.7718	0.5788	0.5627	1		
IFLA	-0.3451	-0.5005	-0.2612	-0.2868	-0.194	-0.2218	1	
TEC	-0.283	-0.2198	0.0888	-0.4866	-0.5354	0.2021	0.0977	1

Source: Authors (2025).

The result of the Zivot and Andrews unit root test, presented in Table 11 reveals that the variables included in the human capital development equation are of mixed order of integration. On the basis of this, the ARDL model is also

utilized in the estimation of the equation, starting with the conduct of the bounds test for cointegration based on the use of the appropriate lags.

Table 11: Human Capital Development Equation, Zivot and Andrews Unit Root Test

Variable	At Level		Structural Break Date	After First Differencing		Structural Break Date	Order of Integration
	Minimum t-statistic	5% Critical Value		Minimum t-statistic	p-value		
HCDE	-2.335	-4.8	2001	-6.72	-4.8	2017	I(1)
FSDV	-3.623	-4.8	1987	-7.101	-4.8	2009	I(1)
FNIA	-7.694	-4.8	2008	-	-	-	I(0)
LEXCE	-2.8	-4.8	1987	-6.166	-4.8	2001	I(1)
LINFA	-3.909	-4.8	2010	-8.347	-4.8	2017	I(1)
IFLA	-5.085	-4.8	1999	-	-	-	I(0)
LCESS	-4.422	-4.8	2011	-10.591	-4.8	1988	I(1)
TEC	-3.108	-4.8	1993	-6.903	-4.8	2001	I(1)

Source: Authors (2025).

Again, based on the AIC criteria, 3 lags are utilized as the optimal lags for the estimation of human capital development equation (Table 12). This is in line with the HQ and FPE criteria.

Table 12: Vector Auto Regression (VAR) Optimal Lag Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	126.7020	NA	2.25e-14	-5.8851	-5.5051	-5.7477
1	400.6007	410.8481*	1.60e-18	-15.53	-11.73006*	-14.1561
2	489.5646	93.41209	2.06e-18	-15.9282	-8.70827	-13.3177
3	641.5356	91.18258	5.71e-19*	-19.47678*	-8.83684	-15.62971*

Source: Authors (2025).

The result of the bounds test for cointegration (Table 13) reveals that variables included in the equation are cointegrated. This is because the F-value of the test (5.167232) is greater than the critical values for the lower (2.11) and upper (3.15) bounds of the test at the 5% level of significance. On the basis of this, both short and long-run versions of the economic growth equation are estimated.

Table 13: Autoregressive Distributed Lag (ARDL) Bounds Test for Cointegration

Test Statistic	Value	Significance	I(0)	I(1)
F-statistic	5.167232	10%	1.85	2.85
K	8	5%	2.11	3.15
		2.5%	2.33	3.42
		1%	2.62	3.77

Source: Authors (2025).

The results of the short-run estimation of the human capital development equation (Table 14) reveal that the one-year lags of human capital development, current year financial sector development, previous years financial access, the structural break in financial sector development, one and two year-lags of federal government capital expenditure on social and community services, current year exchange rate, one and two-year lags of infrastructure and, one and two-year lags of technology have statistically significant negative effects on human capital development in Nigeria in the short-run.

Table 14: Short-Run Autoregressive Distributed Lag (ARDL) Model Estimates

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(HCDE(-1))	-0.35503	0.072473	-4.89874	0.0081
D(HCDE(-2))	0.129645	0.072872	1.779075	0.1498
D(FSDV)	-0.84107	0.19482	-4.31719	0.0125
D(FSDV(-1))	2.497822	0.21553	11.58921	0.0003
D(FSDV(-2))	0.65584	0.167987	3.904114	0.0175
D(FNIA)	4.37834	0.485171	9.024325	0.0008
D(FNIA(-1))	-1.74602	0.454521	-3.84145	0.0184
D(FNIA(-2))	0.760963	0.286204	2.658816	0.0565
D(DUFSDV)	-0.19575	0.026855	-7.28913	0.0019
D(DUFSDV(-1))	0.172459	0.027906	6.179986	0.0035
D(DUFSDV(-2))	0.046394	0.020405	2.273682	0.0854
DLOG(CESS)	0.050476	0.004476	11.27632	0.0004
DLOG(CESS(-1))	-0.04803	0.006495	-7.39474	0.0018
DLOG(CESS(-2))	-0.02148	0.0045	-4.77363	0.0088
DLOG(EXCE)	-0.01624	0.005482	-2.96295	0.0414
DLOG(EXCE(-1))	0.044548	0.005796	7.686629	0.0015
DLOG(EXCE(-2))	0.018663	0.006723	2.775886	0.05

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLOG(INFA)	0.063209	0.015987	3.953749	0.0168
DLOG(INFA(-1))	-0.37599	0.034321	-10.9549	0.0004
DLOG(INFA(-2))	-0.30723	0.028964	-10.6074	0.0004
D(IFLA)	-0.00035	0.000132	-2.60601	0.0597
D(IFLA(-1))	0.001094	0.000134	8.189848	0.0012
D(IFLA(-2))	0.000411	0.000128	3.210734	0.0326
D(TEC)	-0.06689	0.029197	-2.29112	0.0838
D(TEC(-1))	-0.12418	0.036584	-3.3942	0.0274
D(TEC(-2))	0.22663	0.038361	5.907781	0.0041
CointEq(-1)*	-0.66986	0.051691	-12.959	0.0002
Adjusted R-squared		0.899243		
Durbin-Watson stat		2.312696		

Source: Authors (2025).

On the other hand, the result reveals that the one and two-year lags of financial sector development, one-year lag of the financial sector development dummy variable, current year financial access, federal government capital expenditure on social and community services, current year infrastructural development, one and two-year lags of inflation and one-year lag of inflation have positive and statistically significant short-run effects on human capital development in Nigeria. Furthermore, from Table 16, it can be seen that the two-year lags of human capital development, financial sector development dummy variable and financial access have statistically insignificant positive effects on economic development in Nigeria in the short-run, while the impact of inflation is negative but statistically insignificant.

The error correction coefficient has the theoretically expected negative sign and is statistically significant at the 5% level of significance. The value of its coefficient indicates that the speed of adjustment of the equation is reasonable at 0.66986%, implying that 66.986% of the short-run deviation of human capital development from its equilibrium position is corrected in the long-run. The adjusted coefficient of determination of 89.9243% indicates that the model has a good fit, while the Durbin-Watson statistic indicates the absence of autocorrelation in the equation.

The long-run estimates of the human capital development equation are presented in Table 15. From the result, it can be seen that all the variables do

not have statistically significant effects on human capital development in Nigeria in the long-run. The only variable with a statically significant impact on human capital development, when evaluated on the basis of the 10% level of significance is infrastructural development. It can however be seen that financial sector development and its dummy variable, the exchange rate, inflation and technology all have negative long-run relationships with human capital development in Nigeria, while financial access, federal government expenditure on social and community services and infrastructural development have positive relationships with human capital development in Nigeria during the period.

Table 15: Long-Run Autoregressive Distributed Lag (ARDL) Model Estimates

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FSDV	-7.06427	5.036225	-1.40269	0.2334
FNIA	14.4896	10.18003	1.423336	0.2277
DUFSDV	-0.92263	0.728611	-1.26629	0.2741
LOG(CESS)	0.247977	0.137213	1.807247	0.145
LOG(EXCE)	-0.10637	0.08853	-1.20148	0.2958
LOG(INFA)	0.643537	0.284003	2.26595	0.0861
IFLA	-0.00357	0.002118	-1.68613	0.167
TEC	-0.08294	0.216268	-0.3835	0.7209
C	-1.328	0.987188	-1.34523	0.2498

Source: Authors (2025).

The result of the first post-estimation test, the Ramsey RESET conducted with respect to the human capital development equation is presented in Tables 16 to 18 and, Figures 3 and 4. The results of these tests which include the Ramsey RESET, Jarque-Bera test, Breusch-Godfrey test for serial correlation, Breusch-Pagan-Godfrey test for heteroskedasticity, and CUSUM test for parameter stability all reveal that the equation is correctly specified, devoid of autocorrelation with its residuals being homoscedastic and normally distributed and characterized by stable parameters.

Table 16: Ramsey Regression Equation Specification Error Test (RESET)

	Value	Df	Probability
t-statistic	0.869998	3	0.4483
F-statistic	0.756897	(1, 3)	0.4483

Source: Authors (2025).

The result of the second specification test, the Jarque-Bera test, indicates that the residuals from the estimated human capital development equation are normally distributed. This is because the test probability value of 0.53696 is greater than the 0.05 critical value.

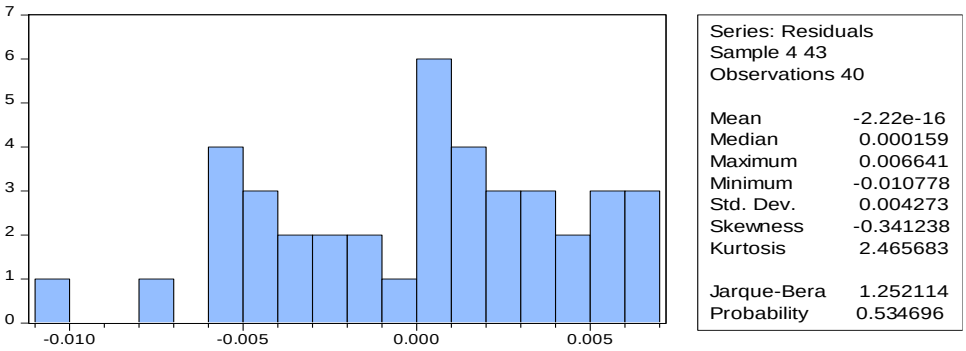

Figure 3: Jarque-Bera Test for Normality Result
Source: Authors (2025).

Table 17: Breusch-Godfrey LM Test for Serial Correlation

F-statistic	1.430077	Prob. F(2,2)	0.4115
Obs*R-squared	23.53962	Prob. Chi-Square(2)	0

Source: Authors (2025).

Table 18: Breusch-Pagan-Godfrey Test for Heteroskedasticity

F-statistic	0.677356	Prob. F(35,4)	0.7697
Obs*R-squared	34.22538	Prob. Chi-Square(35)	0.5053
Scaled explained SS	0.250818	Prob. Chi-Square(35)	1

Source: Authors (2025).

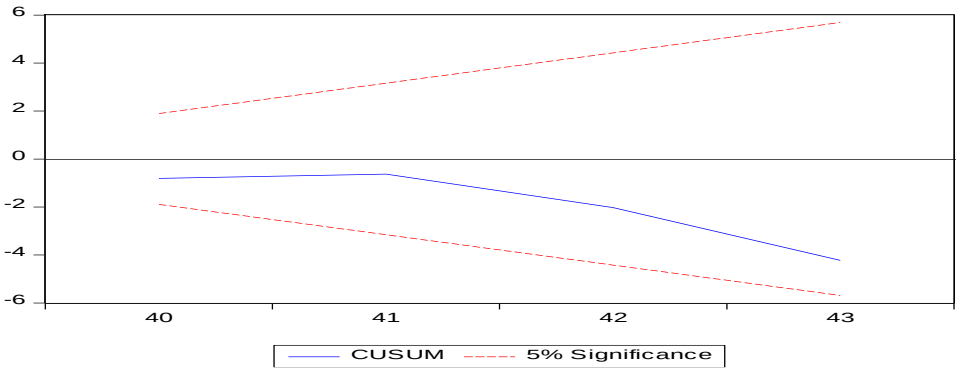

Figure 4: Cumulative Sum of Squares (CUSUM of Squares) Test for Parameter Stability

Source: Authors (2025).

5. Conclusion

The development of the financial sector and financial access are generally recognized as being two of the key determinants of the level of development of a country. In line with this, developing countries such as Nigeria have made the development of the financial sector and promotion of increased financial access key targets of their macroeconomic policies.

In line with the foregoing, this study examined the impact of the outcomes of such efforts on economic development in Nigeria. Based on the results derived, the study concludes that financial sector development, while having a positive relationship with economic growth in Nigeria, only significantly impacts it in the long run, while its structural break impacts the growth of the economy in the long run. The implication of this is that it takes time for the financial development efforts of the Central Bank of Nigeria, such as its financial innovation efforts, to be transmitted to the economy, even though they might have certain temporary short-run effects. The study also concludes that financial access does not have a significant impact on economic growth in Nigeria.

On the other hand, the study concludes that financial sector development and its structural break only positively affect human capital development in Nigeria after the first year, while financial access negatively and significantly affects human capital development in the short run.

Based on these findings, the study recommends that the Central Bank of Nigeria (CBN) carry out a review of its policies aimed at financial development and access, especially its financial innovation policies to take into account the infrastructure challenges in the country with respect to the supply of electricity. The CBN should also move away from emphasizing quantity-based inclusion to quality-based inclusion. It should also carry out a reassessment of its microcredit schemes, while also improving the coverage of its financial literacy programmes. The study further recommends that the CBN improve its education-focused financial products, such as student loan schemes, health savings accounts, and education bonds, that directly invest in human capital and provide incentives to banks and Fintechs to offer low-interest education and health loans with grace periods that align with the delayed positive impact observed.

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