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Impact of financial development on economic growth in Nigeria

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Abstract

The study investigated the impact of financial development on economic growth in Nigeria utilising annual data from 1985 to 2022 sourced from the Central Bank of Nigeria Statistical Bulletins and World Bank indicators. The variables used in this study were real gross domestic product (RGDP), a proxy for economic growth as the dependent variable while credit to the private sector, a proxy for financial deepening, all share index (ASI), nominal exchange rate (ER), gross savings (GS), remittances (REM) and financial technology (Fin-Tech_dum) were all used as financial development indicators which are the independent variables. The method of analysis employed was the Auto-regressive Distributed Lag (ARDL) and the pairwise granger casualty test. The ARDL long run results show that all share index, exchange rate and financial technology positively and significantly affects economic growth; credit to the private sector and gross savings positively but insignificantly impacts on economic growth. However, remittances reveal a negative and insignificant impact on economic growth in Nigeria. The Pairwise causality test shows that there are three unidirectional causality which runs from economic growth to credit to private sector, financial technology and gross savings in Nigeria. In conclusion, the findings of the study validate the demand-following theory in Nigeria. The policy recommendation suggests that the Central Bank of Nigeria should promote the adoption of advanced financial technologies and implement cautious expansionary monetary policies in specific sectors to encourage investment and economic growth. Overall, these measures would boost investment and economic growth in the country.

Keywords: Financial Development; Economic Growth; ARDL; Nigeria.

JEL Codes: B26, G1, O16.

1. Introduction

The basic measure of improvement in any economy is economic growth, which makes it an eminent macroeconomic goal in every nation. Economic growth reflects a rise in gross domestic product over time. It involves increased output, services and jobs to enhance citizens' financial well-being (Ogbulu & Torbira, 2012). This global indicator ranks nations like China and the US among the largest economies in the world. Nigeria, as a developing nation, ranks 31st globally in 2022 and is the wealthiest African country in terms of economic growth. Numerous factors, including human capital, technology and government spending have been theoretically and empirically proven to influence economic growth globally and financial development, as suggested by Okpara et al. (2018), is a key factor. Financial development can be defined as a process that signifies enhancement in activities like funding and elaborating on the operations of financial institutions, creating novel (innovative) financial products and cultivating markets for these products, alongside advancing the quantity, quality, and effectiveness of financial intermediary services (Okoye & Ezema, 2021). In the words of Slesman et al. (2019), financial development is described as a multidimensional concept that is determined by the effectiveness and efficiency of the financial sector, particularly the intermediation between the surplus and deficit units of the economy.

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The financial sectors in Nigeria, comprising money, capital and foreign exchange markets, have experienced steady growth. The money market's progress, attributed to increased private sector credit and money supply, has spurred economic growth (Akintola et al., 2020). Similarly, the stock exchange market has flourished, with the All Share Index (ASI) rising to 40.99% YTD by December 2017, setting an African record (Bloomberg, 2017). Despite these positive trends, a critical examination reveals the limitations in the financial sector's ability to support real sector expansion and economic growth (Imoagwu & Ezeanyej, 2019). Against this backdrop, this study examines the impact of financial development on economic growth in Nigeria, particularly focusing on the three major financial markets' contribution to economic growth. Insights from this analysis aim to guide further financial sector enhancement for bolstering economic growth.

1.1. Statement of the Problem

The importance of financial systems in driving economies and fostering growth globally has emphasized the significance of financial development. The Central Bank of Nigeria (CBN) has undertaken policy reforms to bolster financial development in order to boost the economy. These measures encompass interest and exchange rate deregulation, improved banking access, and the establishment of the Nigeria Deposit Insurance Corporation (NDIC) in 1988. The CBN also strengthened regulatory bodies and introduced indirect monetary policies to address 1980s economic challenges (Ogujiuba & Obiechina, 2011). Additionally, the bank consolidation in 2004, raising minimum capital from 2 billion to 25 billion naira, aimed to enhance banking credibility (Balogun, 2007). Despite these initiatives, Nigeria's formal financial sector remains shallow, limiting private sector credit and hindering economic progress (Imoagwu & Ezeanyej, 2019). The country's low per capita income (below \$4,000) and persistent unemployment raise concerns about financial development's capacity to support essential investments for growth (Maduka & Onwuka, 2013).

Previous research (Albert et al., 2021; Umar et al., 2021; Imoagwu & Ezeanyej, 2019) examined financial development's impact on economic growth, utilizing methods like OLS, ARDL and Granger causality. However, a significant gap exists in the literature. Akintola et al. (2020) investigated financial development's influence using indicators in key financial markets (money, capital, foreign exchange), excluding financial technology. This study aims to address this gap by exploring the role of financial technology in economic growth. With inconclusive empirical findings on economic theory's application to finance and growth in Nigeria, this research identifies prevalent theories in the Nigerian economy during the study period. The analysis notably covers a gap in studies spanning 1985 to 2022, extending the investigation's timeframe to include data up to 2022.

The objectives of the study include

- To determine the impact of financial development on economic growth in Nigeria.
- To ascertain if there is a long-run relationship between financial development and economic growth in Nigeria.
- To investigate the direction of causality between financial development and economic growth in Nigeria.

2. Literature review

To achieve the objectives of the chapter, the following sections are presented: conceptual literature review; review of basic theories and empirical literature review.

2.1. Concept of Economic Growth and Financial Development

The concept of economic growth has garnered diverse definitions from various theories and scholars. Jhingan (2004)'s perspective, it signifies an elevation in the living standards of individuals accompanied by a reduction in income inequalities while Todaro (2007) simplifies it as a gradual augmentation of a nation's productive capacity or gradually enhancing a nation's productive capacity. Economic growth assumes paramount importance within the realm of economics and is regarded as a pivotal factor for realizing enhanced social welfare outcomes, which stand as the central aim of economic policies (Ufoeze et al., 2018). In this study, real Gross Domestic Product (RGDP) proxies economic growth, representing the value of all goods and services produced in an economy, adjusted for inflation.

Financial development involves expanding a nation's financial systems to offer diverse services to individuals, businesses, and governments. As outlined by the World Economic Forum (2012), it relies on factors, policies, and institutions for efficient financial intermediation, ensuring access to capital. According to Slesman et al. (2019), the process of financial development nurtures various financial entities, markets, and infrastructure, aiding capital flow for effective allocation. It broadens financial services, benefiting all sectors of the economy (Imoagwu & Ezeanyej, 2019). Recognized for fostering economic growth, a well-developed financial system identifies prospects, mobilizes savings,

supports trade, manages risks, and spurs economic activity (Sanusi, 2011). In this study, we examine the money, stock, and foreign exchange markets to trace financial market evolution. The money market handles short-term securities, the stock market long-term securities and the foreign exchange market facilitates currency trading (Okpara et al., 2018).

2.2. Review of Basic Theories

This section examines theories that explain the relationship between financial development and growth which includes

- i) The **Schumpeterian growth theory** coined in 1911 by economist Joseph Schumpeter. The theory spotlights innovation, entrepreneurship, and technology as prime stimulants of lasting economic growth. It pioneers the notion that financial sector advancement fosters technological innovation and economic expansion (James, 2011; Alpha et al., 2016). Schumpeter (1911) contends that financial intermediaries' roles in savings mobilization, project assessment, risk management, monitoring, and transactions are vital for national innovation and development. Critics argue its disregard for factors like human capital and resources and vague entrepreneurship definition. Nonetheless, it significantly shapes contemporary growth dialogues, shedding light on innovation and financial progress' roles in prolonged prosperity.
- ii) **Supply-leading or finance-led growth hypothesis** which suggests that financial sector expansion drives economic growth in modern capitalism (Umar, 2021). This view advanced by Patrick (1966), proposed that a well-functioning financial sector allocates resources effectively, spurring economic sector growth via surplus-to-deficit transfer. Also, the theory noted Credit creation and financial institutions as key driving mechanisms to economic growth. Critiques of this theory note risks like bubbles, instability and crises could from excessive financialization. However, the Finance-led growth theory offers a perspective on finance's role in economic growth.
- iii) **Demand-following or growth-led hypothesis** proposed by Robinson in 1952 states that financial development is the outcome of growth in the real economy, where enterprise leads, finance follows (Akintola, 2020). The theory posits that growth drives finance, supported by the empirical findings of Ndlovu (2013), Adeyeye et al. (2015), and AbuAl-Foul et al. (2016). This highlights financial markets' development after economic growth, driven by increased demand for financial products. This theory was criticised for considering a unidirectional causality ignoring the possibility of a bi-directional causality.
- iv) **Stage of development theory or feedback hypothesis** also known as the finance-growth nexus, by Hugh Patrick (1966), suggests that the link between financial development and economic growth changes as an economy advances. Initially, supply-side factors drive financial development, but with real growth, there's a rising demand for financial services. The feedback hypothesis backs bidirectional causality between finance and growth, showing a two-way link (Alenoghena et al., 2020). This reveals a dynamic relationship between financial development and economic growth.

2.3. Empirical Literature Review

Albert et al. (2022) studied the impact of financial development on economic growth in Nigeria (1980-2019) using Ordinary Least Squares. They explored four equations with GDP as the dependent variable. Results showed positive relations between economic growth and paired variables (real interest rate, gross domestic savings), (real interest rate, private sector credit), and (savings, private sector credit). However, combining all 3 variables, real interest rate and savings had an insignificant negative impact, while private sector credit had a significant positive impact on Nigeria's growth.

Song and Appiah-Otoo (2022) employed a dataset that comprises 31 provinces in China to study the impact of financial technology (fintech) on economic growth from 2011 to 2017. The instrumental variable-generalized method of moments technique was employed and the result showed that fintech has a positive impact on economic growth of China. Ani and Udeh (2021) studied the effect of exchange rate on economic growth in Nigeria from 2009 to 2018. The study utilized ordinary least square model and it was found that exchange rate has positive and significant impact on economic growth in Nigeria.

Umar et al. (2021) explored the impact of financial development on economic growth in Nigeria from 1980 to 2019. Using nonlinear autoregressive distributed lag analysis, they identified a lasting connection amid asymmetries. Results showed positive financial development shocks negatively impacted both short and long-term growth, with negative shocks having a similar effect. Inflation had a significant positive impact, while uncertain financial globalization exhibited no meaningful connection to Nigerian economic growth.

Akintola et al. (2020) studied the impact of financial sector development on economic growth in Nigeria using quarterly data between 2000Q1 and 2019Q4 using the Autoregressive Distributed Lag technique. The results indicated that while financial deepening, banking system liquidity and all share index had positive and significant impact on the growth of real output in the long run, the behaviour of exchange rate spread was consistent with falling levels of real output growth.

Alenoghena et al. (2020) studied the impact of financial development on economic growth from 1980 to 2018. They used the NARDL approach to analyze their connection, finding a U-shaped asymmetrical relationship. The research determined that the financial development variables and economic growth are cointegrated in the long run. Threshold regression indicated that when broad money falls below 17.73% of GDP or credit to the private sector drops below 6.03% of GDP, Nigeria's economic growth declines.

Chen et al. (2020) examined the asymmetric influence of financial development on economic growth in Kenya from 1972 to 2017 using Non-linear Autoregressive Distributed Lag (NARDL). The results posit that positive shocks in financial development in the short run and its negative shocks in the long run increase and decrease economic growth respectively. Regarding inflation, its positive (negative) shocks in both runs, respectively, reduce (increase) economic growth. In comparison, positive shocks in financial development that spur growth in the short run and negative shocks in financial development (government expenditure) that increase (reduce) growth are the most domineering effects as the rest of the shocks insignificantly affect growth.

Okunlola et al. (2020). Investigated the causal relationship between financial development indicators and economic growth using the Toda and Yamamoto approach for the period 1985 to 2015. The Toda and Yamamoto approach is based on an augmented VAR modeling and the findings include that a bi-directional causality was found between financial markets indicators and economic growth while unilateral causality running from stock market indicators to GDP was established.

Imoagwu and Ezeanyej (2019) studied the impact of financial development on economic growth from 1986 to 2017. They used error correction and Toda-Yamamoto tests, finding a short-term positive link between financial development and growth, but a negative impact in the long-term. Causality was from finance to growth. Stock market cap bolstered short-term growth, but hindered it long-term. Interest rate had a slight short-term positive impact, but a significant negative effect long-term. Domestic credit ratio's positive impact was only long-term. Causality was observed from various sectors to financial development.

In Okpara et al. (2018) study, the econometric analysis of financial development's impact on Nigeria's economic growth is explored using vector error correction and Granger Causality tests. The study establishes a lasting link between financial development and economic growth. Various financial development indicators foster economic growth. Short-term causalities are identified: capital market liquidity (VST/GDP) and economic growth display mutual influence, as does economic volatility (CPS/GDP). Market Capitalization ratio (MKT CAP/GDP), Broad money velocity (M2/GDP), and banking system's role in economic financing (DD/M1) unidirectionally propel economic growth. This highlights the role of financial development indicators in driving immediate economic growth.

Judith and Chijindu (2016) examined the relationship between financial development and economic growth in Nigeria between 1987 and 2014 using the error correction and granger causality test to assess the finance-growth link. The findings indicate that financial development and economic growth move along together in the long run. It was revealed that credit to the private sector, stock market capitalization and inflation have negative and impact on the economy, while broad money supply, trade openness and foreign direct investment exert positive influence on the economy. The error correction term in the model availed us the correctional influence in the speed of adjustment which indicated that errors of divergence from equilibrium was corrected at the speed of 86% each year. The Granger causality tests show that gross domestic product was granger causal for foreign direct investment, without a feedback system.

Oshota and Badejo (2015) empirically investigated the impact of remittances on economic growth in Nigeria, covering the period of 1981 to 2011. The method of analysis employed was error correction model and the result revealed that remittances positively impacted economic growth in Nigeria. Chinaemerem and Chigbu (2012) carried an evaluation of financial development and economic growth in Nigeria from 1960 to 2008 using error correction method and causality test. The results showed that money supply and credit to private sectors are cointegrated with economic growth and they are positively related to economic growth. Also, the Granger causality test showed that all the exogenous variables granger causes economic growth in Nigeria.

3. Research methodology

3.1. Theoretical Framework.

The foundation of this study's theory is constructed upon three contrasting perspectives regarding the interconnection of finance and economic growth - the supply-leading theory, the demand-following theory and the feedback hypothesis

postulated by Greenwood and Jovanovic (1990). These three theories effectively address the correlation between financial development and economic growth, echoing the examination conducted by Akintola et al. (2020).

3.2. Model Specification and Estimation Technique.

To meet the core objective of this study, the task of this section is to construct a model relating to the various key variables identified as factors within the context of the topic. Hence, for this purpose, we adopted the empirical model of Akintola et al. (2020) which is specified thus:

$$RGDP = f(\text{FD, MPR_IBCR, ASI, MC, USD_BDC}) \quad (1)$$

The above model has real gross domestic product growth which is a proxy for economic growth as the dependent variable while financial deepening (FD), short-term interest rate spread (MPR_IBCR), all share index (ASI), market capitalization (MC) and exchange rate spread (USD_BDC) are the independent variables which are financial development indicators. These variables consider the three major components of the financial market which are the money market, capital market and foreign exchange market. Using a similar model to the above model, this current study goes further to consider the importance of technology in financial development which is captured using a dummy variable and gross savings as well as remittances which is an external indicator of financial sector development. More so, this study captures the financial deepening using credit to privates sectors as a percentage of GDP. Hence, in relation to this study, the model is re-specified in a functional form as

$$RGDP = f(\text{CPS, ASI, ER, GS, REM, FIN-TECH_dum}) \quad (2)$$

The mathematical model is stated as

$$RGDP = \text{CPS} + \text{ASI} + \text{ER} + \text{GS} + \text{REM} + \text{FIN-TECH-dum}. \quad (3)$$

The econometric form will be

$$RGDP_t = \beta_0 + \beta_1 \text{CPS}_t + \beta_2 \text{ASI}_t + \beta_3 \text{ER}_t + \beta_4 \text{GS}_t + \beta_5 \text{REM}_t + \beta_6 \text{TECH_dum}_t + \mu_t \quad (4)$$

Where RGDP is the real gross domestic product, CPS is the credit to the private sectors, ASI is the share index, ER is the exchange rate, GS is gross savings, REM is remittances and FIN_TECH_dum is a dummy variable for financial technology, β_0 is constant/intercept term., $\beta_1 - \beta_6$ is the coefficient of the parameter estimated for the slope, μ is the error or disturbance term and t is the time period.

To illustrate the ARDL modelling approach adopted for the study, equation 4 will be restated as follows.

$$\begin{aligned} \Delta RGDP_t = & \alpha + \sum_{i=1} \beta_i \Delta \text{CPS}_{t-1} + \sum_{i=1} \delta_j \Delta \text{ASI}_{t-1} + \sum_{i=1} \phi_k \Delta \text{ER}_{t-1} + \sum_{i=1} \lambda_i \Delta \text{GS}_{t-1} + \sum_{i=1} \psi_m \Delta \text{LnREM}_{t-1} + \sum_{i=1} \ddot{Y}_n \Delta \text{FIN-TEH_dum}_{t-1} \\ & + \eta_1 \text{CPS}_{t-1} + \eta_2 \text{ASI}_{t-1} + \eta_3 \text{ER}_{t-1} + \eta_4 \text{GS}_{t-1} + \eta_5 \text{LnREM}_{t-1} + \eta_5 \text{FIN-TECH_dum}_{t-1} + \mu_t \end{aligned} \quad (5)$$

In the above ARDL equation, the terms with the summation signs (\sum) represent the Error Correction Model (ECM) dynamics. The coefficients η are the long-run multipliers corresponding to the long-run relationship. α and μ_t represent the constant and the white noise or disturbance term respectively while β_i , δ_j , ϕ_k , λ_i , ψ_m and \ddot{Y}_n represent the short-run effects. Δ is the first difference operator while Ln is the logarithm. This is a Lin-log model.

3.3. Data Sources and Explanation of Variables.

The study employed secondary data from Central Bank Statistical Bulletin and World Bank Indicators (WDI), spanning 1985 to 2022. Key variables collected are real Gross Domestic Product (RGDP) - representing economic growth, adjusted for inflation, annually measured as a percentage. Independent financial development indicators encompass credit to the private sector (CPS_GDP) - loans divided by nominal GDP; All-share index - gauges listed companies' stock market performance; Gross savings as % of GDP - measures savings relative to GDP; exchange rate (ER) - currency value relative to another for trade, investment and transactions. Control variables include remittances (REM) - money sent by expatriates, reflecting financial system capture, and financial technology (FinTech) - innovative tech for enhancing financial services. FinTech is introduced as a dummy variable as it is assumed to potentially boost economic growth.

The study explores the relationship between these variables and economic growth, utilizing comprehensive financial and economic data over the examined years.

4. Data presentation, analysis and result

The study employed the use of econometric tools in the analyses of the variables as shown in the model. The E-views package was used in the estimation process and results are presented in tables.

4.1. Data Analysis and Presentation

The time series data were analysed and are shown in the appendix. The descriptive statistics showed that real gross domestic product, credit to private sectors, all share index and nominal exchange rate were normally distributed while remittances and financial technology were not normally distributed.

The Augmented Dickey-Fuller (ADF) unit root was used to determine the stationarity of all the variables as seen in Table 1.

Table 1 Summary of ADF Unit root test

Variable	ADF Critical value @ 5%	ADF Statistic	Order of Integration
RGDP	-2.945842	-3.311207	I (1)
CPS	-2.948404	-5.597415	I (1)
ASI	-2.948404	-6.75667	I (1)
ER	-2.945842	-4.087338	I (1)
GS	-2.945842	-4.957605	I (1)
FINTECH	-2.945842	-6	I (1)
REM	-2.943427	-3.293765	I(0)

Source: Author's Computation from E-views-10.

Table 1 shows that all the variables are stationary at first difference apart from remittances which is stationary at level. This enhances the use of Autoregressive distributed Lag to check for cointegration using the F_ bound test as seen in Table 2.

Table 2 Cointegration test using F_ bound Test

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	6.566014	10%	2.12	3.23
K	6	5%	2.45	3.61
		2.5%	2.75	3.99

Source: Authors' computation from E-views-10.

Evidence from Table 2 shows that since the F- statistics is greater than the F- tabular at 5% level of significant levels. Thus, there is a long-run relationship between the independent variables which indicate financial development and real gross domestic product, a proxy for economic growth.

4.2. Evaluation of Long Run and Short Run Estimates

4.2.1. Panel A: Short run estimates

This shows the short-run impact of the financial development indicators on real gross domestic product, a proxy for economic growth and the speed of adjustment to equilibrium in the long run which is seen in Table 3.

Table 3 Summary of short-run estimate

ECM Regression				
Case 3: Unrestricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	8804.694	932.8931	9.438052	0.0000
D(ASI)	1.582948	0.295898	5.349644	0.0000
D(ER)	-15.24233	7.258760	-2.099854	0.0486
D(FINTECH)	-2683.127	1298.048	-2.067047	0.0519
D(FINTECH(-1))	-4540.512	1718.773	-2.641717	0.0156
D(LNREM)	294.8756	111.8846	2.635533	0.0159
D(LNREM(-1))	272.6550	112.0588	2.433141	0.0245
D(CPS)	102.1056	119.9419	0.851292	0.4047
D(GS)	-81.22173	189.5614	-0.428472	0.6729
CointEq(-1)*	-0.384927	0.049797	-7.729860	0.0000
R-squared	0.816377	Mean dependent var		1627.456
Adjusted R-squared	0.752815	S.D. dependent var		1507.688
S.E. of regression	749.5870	Akaike info criterion		16.30706
Sum squared resid	14608898	Schwarz criterion		16.74692
Log likelihood	-283.5270	Hannan-Quinn criter.		16.46058
F-statistic	12.84385	Durbin-Watson stat		2.236385
Prob(F-statistic)	0.000000			

Source: Authors' computation from E-views 10

Evidence from Table 3 reveals that with all independent variables at zero or constant, the average increase in real gross domestic product (GDP) is 8804.69 units. A unit increase in the all-share index, representing the capital market, leads to an average real GDP increase of 1.58 units, indicating a positive impact. In contrast, the nominal exchange rate, reflecting the foreign exchange market, has a negative influence on real GDP. Specifically, a unit rise in the exchange rate results in an average reduction of 15.24 units in real GDP, holding other factors constant.

Furthermore, the analysis of the financial technology variable—both the current value and its lag—shows an unexpected negative effect on real GDP in the short term. This implies that an increase in financial technology by one unit corresponds to an average decrease of 2683.12 and 4549.51 units in real GDP in Nigeria. The study also underscores the positive correlation between remittances and real GDP in Nigeria, with both current and lagged values. A 1% rise in remittances and their lagged counterparts corresponds to average real GDP increases of 294.87 and 272.65 units, respectively. Regarding credit to the private sector, a measure of financial deepening, the results align with expectations. An average percentage increase in credit to the private sector leads to a real GDP rise of 102.12 units in Nigeria. Conversely, gross savings—a proxy for the money market—exhibits a counterintuitive negative influence on real GDP. An average percentage increase in gross savings corresponds to a reduction of 81.22 units in real GDP in Nigeria. The calculated speed of adjustment is 0.38, indicating a gradual transition of 38% from short-term disequilibrium to long-run equilibrium—a slow adjustment process.

4.2.2. Panel B: Long run estimates

Table 4 presents the estimated long-run coefficients for the specified model. This result is discussed based on the economic, statistical and econometric criteria.

Table 4 Summary of long-run estimate

Levels Equation				
Case 3: Unrestricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
ASI	7.247029	1.348417	5.374472	0
ER	38.30066	11.06749	3.460646	0.0025
FINTECH	20544.84	5042.928	4.073991	0.0006
LNREM	-175.2518	521.1618	-0.336271	0.7402
CPS	94.84108	603.6408	0.157115	0.8767
GS	153.4391	701.0461	0.218872	0.829

Source: Authors' computation from E-views 10.00

Based on the economic a priori expectation, it is evident from Table 4 that all share index (ASI) has a positive and significant impact on real gross domestic product in the long run. Thus, a unit increase in all share index, on average, leads to a 7.24 unit increase in real gross domestic product which is economic growth, in the long run. This conforms to economic expectations and reality. Nominal exchange rate (ER) exhibits a positive and significant impact on real gross domestic product in the long run. Thus, an increase in the nominal exchange rate, on average, increases real gross domestic product by 38.30 units in the long run ceteris paribus. This does not conform to economic expectations but holds given that Nigeria is an import-dependent nation.

Also, financial technology is seen to have a positive and significant impact on real gross domestic product in Nigeria. This conforms to economic expectations given that increase in financial technology improves financial development and increases economic activities in Nigeria. This implies that an increase in financial technology, on average, increases real gross domestic product by 20244 units ceteris paribus in Nigeria. The estimate of remittances has a negative and insignificant impact on real gross domestic product which does not conform to economic expectations. Thus, a percentage increase in remittances, on average, reduces real gross domestic product by 175.25 units ceteris paribus.

More so, credit to the private sector has a positive and insignificant impact on real gross domestic product in Nigeria in the long run and this does conform to economic expectation. Thus, a 1% increase in the credit to the private sector, on average, increases the real gross domestic product by 94.84 units ceteris paribus. Also, the estimate of gross savings showed a positive and insignificant impact on the real gross domestic product growth rate which does conform to economic expectations. Thus, a percentage increase in gross savings, on average, increases the real gross domestic product by 153.43 units in the long run.

Table 5 Summary of Autocorrelation and Heteroscedasticity.

Breusch-Godfrey Serial Correlation LM Test			
F-statistic	0.516073	Prob. F(2, 18)	0.6054
Heteroscedasticity Test: Breusch- Pagan Godfrey			
F-statistic	0.284961	Prob. F(15, 20)	0.9917

Source: Authors' computation from E-Views 10.

The statistical criterion is tested using the R^2 , adjusted R^2 and F- statistics which can be seen in Table 3. The R^2 of 0.81 shows that the model is a good fit and the independent variables, that is, financial development indicators account for the variations in the dependent variable (economic growth) at 81%. While other possible variables not captured in the model explain about 19% of the variation in the real gross domestic product in Nigeria. The adjusted R^2 supports this

given that it has a value of 0.75 showing that the independent variables (the regressors) explain the real gross domestic product. The F- statistics having the F calculated as 12.84 is greater than the F- tabulated at a 5% level of significance which is 3.81. This shows the overall significant impact of financial development indicators on the real gross domestic product in Nigeria.

The model's econometric criteria are assessed for autocorrelation and heteroscedasticity through two tests presented in Table 5. In the Breusch-Godfrey LM serial correlation test, the null hypothesis remains unchallenged at a 5 percent level due to a value of 0.6054 exceeding 0.05. This implies the absence of autocorrelation in the errors. Similarly, the Breusch-Pagan-Godfrey heteroskedasticity test fails to reject the null hypothesis at the 5 percent level with a value of 0.9917 surpassing 0.05, indicating homoscedastic variables and no heteroscedasticity issue. The analysis concludes by using the CUSUM and CUSUM squares stability test, depicted in Fig 1.

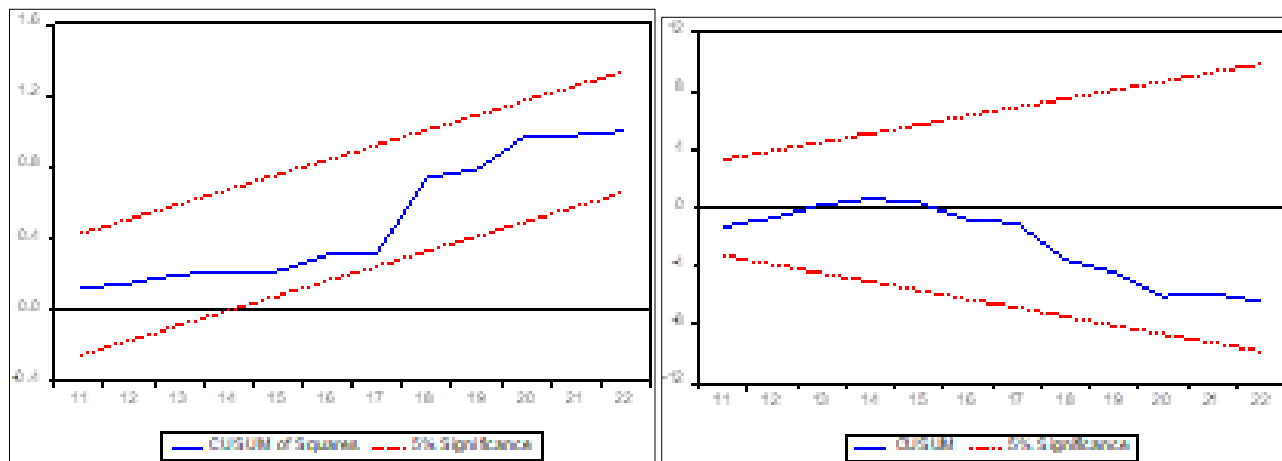


Figure 1 Diagram of CUSUM and CUSUM squares

Source: Eviews 10 Output

The CUSUM and CUSUM squares show that the model is stable at the 5% level of significance and this supports the econometric criterion test that the results are fit for predictions and are reliable.

4.3. Granger Causality test

Table 6 Summary of Pairwise granger causality

Null Hypothesis:	Obs	F-Statistic	Prob.
ASI does not Granger Cause RGDP	36	1.93923	0.1609
RGDP does not Granger Cause ASI		1.94048	0.1607
CPS does not Granger Cause RGDP	36	1.36851	0.2694
RGDP does not Granger Cause CPS		8.61728	0.0011
ER does not Granger Cause RGDP	36	1.16017	0.3267
RGDP does not Granger Cause ER		2.46899	0.1012
FINTECH does not Granger Cause RGDP	36	0.58266	0.5644
RGDP does not Granger Cause FINTECH		3.61374	0.0388
GS does not Granger Cause RGDP	36	2.07983	0.1420
RGDP does not Granger Cause GS		5.56089	0.0086
REM does not Granger Cause RGDP	36	2.95116	0.0671
RGDP does not Granger Cause REM		3.11947	0.0583

Source: Author's computation from E-views -10

Granger Causality is one of the statistical methods used to investigate causal relationships and forecasting. The study uses the pairwise granger causality to test for the direction of causality between financial development and economic growth.

The results presented in Table 6 show that unidirectional causality runs from real gross domestic product to credit to private sector, financial technology and gross savings given that their F-calculated is greater than the F-tabulated of 3.81. This is also supported by their probability values which are less than 5% level of significance.

5. Discussion of Findings

The study examines the relationship between financial development and economic growth in Nigeria. Descriptive statistics using the Jarque-Bera reveal that most variables are normally distributed, except remittances and financial technology. ADF tests indicate that all the variables are stationary at first difference, except remittances which are stationary at level. The F-bound test reveals a significant long-run relationship between financial development indicators and economic growth similar to the findings of Mesagan et al. (2019). ARDL results detail the short and long-term impact of independent variables on economic growth.

The All-Share Index (ASI), a proxy for the capital market, positively and significantly affects real GDP in the short and long run, implying that means that an increase in the share index in Nigeria, improves the stock exchange market which is an indication of financial development and hence, increases economic growth in the country which does conform to economic expectations. This result is consistent with the findings of Akintola et al. (2020) in the long run. Credit to the private sector (CPS), a proxy for financial deepening, positively impacts RGDP insignificantly in the short run, while significantly in the long run, indicating limited impact on growth in Nigeria. This result conforms to economic expectation but its insignificance shows that financial deepening in Nigeria is not sufficient to enhance economic growth. The long-run results conform to the findings of Imoagwu & Ezeanyej (2019) and Albert et al. (2021). For the foreign exchange market proxied by nominal exchange rate (ER), the estimate shows that nominal exchange rate significantly negatively impacts real gross domestic product in the short run but significantly positively impacts in the long run, suggesting short-term import-related challenges and long-term growth potential in Nigeria which can only be accomplished if Nigeria shifts to become a productive nation in the long run. This short-run result aligns with the findings of Akintola et al. (2020) in the short run but the long-run result contradicts their findings in the long run.

Short-term gross savings (GS), a money market indicator, surprisingly exhibit a negative and insignificant influence on real GDP, despite expectations. This occurs as higher savings cut spending, mildly affecting the economy. In the long term, the effect becomes positive yet still negligible, attributed to savings being redirected into investments that fuel growth. Nonetheless, the prolonged insignificance highlights restricted fund access due to insufficient financial development, notably observed in Nigeria's private sector credit. This aligns with Albert et al.'s (2019) findings. The study also shows that in the short term, higher remittances and their lag positively impact Nigeria's real domestic product, aligning with economic expectations, due to increased household income and financial literacy, along with greater investment capital. However, in the long run, this positive effect diminishes as the loss of essential human capital hampers economic growth, contrary to expectations. This finding corroborates the finding of Oshota and Badejo (2015) which reveals a positive impact. Financial technology and its first lag initially impact real GDP negatively and insignificantly, defying economic predictions. This could be due to inadequate regulation of certain fin-tech activities in Nigeria's nascent stage, causing potential financial instability. However, over the long term, a positive and significant correlation between financial technology and economic growth emerges, aligning with a prior expectation. Song and Appiah-Otoo (2022) also established a similar result in their study. The third major finding of this study is from the pairwise Granger causality test confirms uni-directional causality from GDP to credit, financial technology and savings. This is quite similar to the findings of Okpara et al. (2018) who found causality running from economic growth to credit to the private sector. This validates the demand-following hypothesis in Nigeria given that economic growth creates room for increased financial services which boosts financial development and this aligns with the findings of Rehman & Cheema (2013) and Khan et al. (2019). The study's model passes tests for reliability and stability, making findings valuable for policymaking and prediction.

6. Conclusion

The findings' policy implications highlight that shifts in key variables (ASI, Fin-Tech, ER) are likely to influence Nigeria's economic growth. Hence, encouraging ASI and Fin-Tech can lead to sustained economic growth. The study concludes that the capital and foreign exchange markets have more impact on Nigerian economic development than the money market, as well as affirming the demand-following hypothesis that economic growth predicts financial development in

Nigeria. The major policy recommendations include that the central bank should pursue financial development through advanced technologies and targeted expansionary monetary policies, fostering investment and growth. Also, they should implement a robust inflation-targeting framework that can stabilize the macro economy, enhancing the stock exchange (all-share index) and ensuring long-term growth. The federal government should as well prioritize infrastructure and human capital to boost business productivity, savings, credit, and private-sector investment, fostering economic growth.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

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