Impact of FinTech Development on Economic Growth in Nigeria

Prof. Aliyu IDRIS
[1]Revenue Mobilisation Allocation and Fiscal Commission, Abuja, Nigeria
+2348036129108; dr.aliyuidris@gmail.com

Haruna DZUGWAHI, PhD
[2]Office of the Accountant General of the Federation, Abuja, Nigeria.
+2348028411327, hdbirdling@gmail.com

Abstract

This study examines the impact of financial technology (FinTech) on Nigeria's economic growth by analysing the relationship between real gross domestic product (RGDP) and key FinTech indicators: mobile money transactions (MMT), automated teller machine (ATM) usage, and point-of-sale (POS) transactions. Using time series data from the Central Bank of Nigeria (CBN), the National Bureau of Statistics (NBS), the World Bank, and industry reports, the study employs an Autoregressive Distributed Lag (ARDL) model to assess both short- and long-run dynamics. The findings reveal a significant error correction term (-0.1445, p = 0.0000), confirming a stable long-run relationship between FinTech variables and economic growth. However, while MMT, ATM, and POS transactions exhibit negative and positive long-term relationships with RGDP, their effects are statistically insignificant. The high R-squared (0.9389) and F-statistic (10.5364, p = 0.0026) affirm the model's robustness in the short run. These results suggest that while FinTech enhances financial inclusion, its long-term impact on economic growth remains inconclusive, warranting further investigation.

1.1   Introduction

The financial technology (FinTech) revolution is reshaping the global economic landscape, driving efficiency, enhancing accessibility, and promoting financial inclusion. As digital financial services expand, they provide innovative solutions that bridge traditional banking gaps, especially in emerging economies. Nigeria has positioned itself as one of Africa's leading FinTech hubs, with an ecosystem that has witnessed significant growth in mobile banking, digital payments, blockchain applications, and peer-to-peer lending. This expansion is fueled by increasing smartphone penetration, improved internet access, regulatory advancements, and rising consumer demand for convenient and efficient financial services.

FinTech has the potential to significantly enhance economic growth by revolutionising financial access, reducing transaction costs, and improving the efficiency of financial intermediation. By leveraging digital platforms, mobile applications, and innovative payment solutions, FinTech bridges the gap between traditional banking services and underserved populations, particularly in rural and remote areas. The increased accessibility of financial services allows individuals and businesses to engage in the formal economy, leading to higher savings, increased investment opportunities, and more significant capital mobilisation.

Furthermore, FinTech reduces the cost of financial transactions by minimising the need for physical banking infrastructure and streamlining processes through automation and artificial intelligence. Lower transaction costs translate into more affordable and faster financial services, encouraging more people to participate in economic activities and boosting consumer spending and business expansion. The efficiency gains from FinTech also enhance credit access for small and medium-sized enterprises (SMEs), which are often constrained by traditional banking limitations. Digital lending platforms, peer-to-peer lending, and alternative credit scoring methods enable SMEs to obtain financing more easily, fostering entrepreneurship and innovation.

In addition, integrating financial technology into economic activities enhances productivity by optimising payment systems, improving cash flow management, and facilitating cross-border transactions. FinTech contributes to the overall competitiveness of businesses and industries by reducing delays and inefficiencies in financial transactions. Ultimately, a well-developed FinTech ecosystem can catalyse sustainable economic growth, driving job creation, wealth distribution, and financial inclusion across different sectors of the economy.

1.2   Statement of the Problem

Despite the rapid expansion of Nigeria's financial technology (FinTech) sector, there remains a significant gap in empirical research assessing its direct impact on economic performance. While various studies have explored the broader role of financial deepening in economic development, the specific contributions of digital financial services such as mobile money transactions, automated teller machine (ATM) usage, and point-of-sale (POS) transactions remain underexplored. Most existing literature focuses on traditional banking structures and macroeconomic indicators, leaving a critical knowledge gap regarding how FinTech innovations drive economic activities at both individual and enterprise levels.

Furthermore, while FinTech is widely recognised for promoting financial inclusion, there is limited empirical evidence on whether increased access to digital financial services translates into measurable economic growth. Quantitative analyses often overlook the potential challenges associated with FinTech adoption, such as regulatory uncertainties, cyber security threats, digital infrastructure limitations, and financial literacy deficits. Without a clear understanding of these dynamics, policymakers and industry stakeholders may struggle to implement effective strategies to optimise FinTech's contribution to national development.

This study addresses these gaps by examining the relationship between FinTech development and Nigeria's economic growth. Additionally, the study will provide insights into the structural barriers hindering FinTech's full potential and offer evidence-based recommendations to policymakers, regulators, and industry players. Ultimately, this research contributes to the growing body of knowledge on digital finance by providing empirical evidence on the economic significance of FinTech in an emerging market like Nigeria.

1.3   Objectives of the Study

  i.   To examine the relationship between mobile money transactions and real gross domestic product.
 ii.   To study the effect of automatic teller machine usage on the real gross domestic product.
iii.   To evaluate the effect of point of sale operation on the real gross domestic product.

2.0   Literature Review

2.1   Conceptual issues

Conceptual Issues

Mobile money transactions

Mobile money transactions (MMT) have emerged as a transformative financial innovation, particularly in developing economies, by facilitating seamless transactions, enhancing financial inclusion, and promoting economic activities (Jack & Suri, 2016). Mobile money enables individuals and businesses to conduct financial transactions using mobile devices, reducing reliance on cash-based transactions and improving economic efficiency (Ozili, 2020). By integrating the unbanked population into the formal financial system, mobile money has the potential to boost consumption, savings, and investment, all of which are key drivers of economic growth (Suri & Jack, 2016).

Theoretically, mobile money transactions contribute to economic growth by reducing transaction costs, improving financial intermediation, and expanding access to credit, particularly for micro, small, and medium-sized enterprises (MSMEs) (Beck et al., 2018). However, the extent of this impact varies across economies, as some studies suggest that while mobile money improves financial inclusion, its direct effect on macroeconomic indicators like RGDP remains inconclusive (Demirgüç-Kunt et al., 2020).

Automated Teller Machines

Automated Teller Machines (ATMs) have long been considered a key financial infrastructure that enhances access to banking services by allowing users to withdraw cash, deposit funds, and perform other transactions beyond regular banking hours (Abor, 2005). The widespread adoption of ATMs has contributed to financial sector efficiency by reducing congestion in banking halls and promoting seamless cash distribution (Adewale, 2019).

From an economic growth perspective, ATM usage facilitates increased financial transactions, leading to improved monetary circulation and higher consumer spending, which drives aggregate demand and economic output (Emefiele, 2021). The convenience of ATMs supports cash-based businesses, enhances liquidity within the economy, and minimises financial transaction costs, collectively contributing to RGDP growth (Ojong & Owolabi, 2019).

However, the impact of ATMs on economic growth remains debated, as increased ATM usage could signify a high cash dependency, which may hinder the transition towards a cashless economy (Acha et al., 2020). Additionally, ATM-related challenges such as fraud, network failures, and high maintenance costs can limit their effectiveness in enhancing economic growth (Chukwu et al., 2021).

Point-of-Sale

Point-of-sale (POS) operations represent a critical component of digital financial services, facilitating electronic payments for goods and services in retail and commercial transactions. The adoption of POS systems has increased significantly in Nigeria, driven by government policies promoting cashless transactions and enhancing financial inclusion (CBN, 2022). By enabling businesses to accept digital payments, POS terminals increase transaction efficiency, reduce cash handling costs, and improve revenue tracking (Adeniran & Yusuf, 2020).

From an economic perspective, the widespread use of POS transactions is expected to enhance financial deepening, increase consumption, and improve tax compliance, all contributing to economic growth (Ajibade et al., 2021). Digital payments promote transparency in financial transactions, reducing informal economic activities and fostering a more robust formal economy (Onyeka & Uchenna, 2022). Furthermore, POS operations enhance the velocity of money, allowing for quicker and more efficient financial transactions that support business expansion and overall RGDP growth (Kama & Adigun, 2021).

Despite these benefits, challenges such as transaction failures, high service fees, network instability, and cybersecurity risks limit the effectiveness of POS systems in driving economic growth (Nwankwo et al., 2020).

Empirical Framework

Mobile Money Transactions and Real Gross Domestic Product

Several empirical studies have investigated the impact of mobile money transactions on economic growth, particularly in emerging economies. Jack and Suri (2016) conducted a study in Kenya and found that mobile money significantly contributed to poverty reduction and economic growth by increasing financial inclusion and facilitating business transactions. Similarly, Sahay et al. (2020) analysed data from multiple African countries. They found that mobile money transactions enhance economic growth by reducing transaction costs, improving liquidity, and enabling small businesses to access credit.

In Nigeria, Ozili (2020) explored the effect of digital financial services, including mobile money, on economic performance. Using time series data, the study found that mobile money positively impacts RGDP by increasing the volume of financial transactions and integrating previously unbanked populations into the financial system. Additionally, a study by Adeniyi and Omotayo (2021) confirmed that mobile money usage correlates with increased consumer spending and business expansion, ultimately contributing to GDP growth.

However, some studies suggest that the economic impact of mobile money depends on the regulatory environment and infrastructure readiness. For instance, Demirgüç-Kunt et al. (2020) noted that while mobile money has transformative potential, countries with weak financial regulations and low digital penetration may not experience the full benefits. This suggests that Nigeria needs to strengthen its regulatory framework to maximise the economic benefits of mobile money transactions.

Automated Teller Machines Usage and Real Gross Domestic Product

Empirical studies have also examined the role of ATM usage in economic growth. Beck and Brown (2019) analysed data from 25 developing countries and found that ATM expansion positively influences GDP by improving access to banking services and enhancing financial transactions. Similarly, Acha et al. (2020) studied ATM usage in Nigeria and reported that increased ATM transactions led to higher consumption and investment, thereby driving RGDP growth.

A study by Emefiele (2021) on Nigeria's banking sector found that ATMs contribute significantly to economic activities by improving financial accessibility and reducing the costs associated with traditional banking operations. The research further indicated that ATM transactions facilitate economic growth by enhancing liquidity and increasing consumer spending. Likewise, Chukwu et al. (2021) found that ATM expansion increases cash circulation, positively affecting business transactions and economic output.

However, some researchers argue that excessive reliance on ATMs could limit financial sector efficiency if cash withdrawals remain dominant over digital transactions. Ojong and Owolabi (2019) found that while ATMs contribute to financial deepening, their long-term impact on GDP growth depends on whether they complement or substitute digital financial services. This indicates that a shift towards cashless transactions, rather than cash withdrawals, could enhance the economic benefits of ATM usage in Nigeria.

Point of Sale Operations and Real Gross Domestic Product

Empirical evidence suggests that adopting POS transactions significantly impacts economic growth by promoting financial inclusion and reducing cash dependency. A study by Nwankwo et al. (2020) analysed the impact of POS transactions in Nigeria and found a positive relationship between POS usage and RGDP. The research highlighted that increased POS adoption enhances business efficiency, reduces transaction costs, and improves tax revenue collection.

Similarly, Onyeka and Uchenna (2022) examined the effect of POS transactions on economic performance in Nigeria. They reported that electronic payment systems contribute to GDP growth by increasing the velocity of money and promoting digital financial inclusion. Their findings indicate that the widespread adoption of POS systems reduces the informal economy by encouraging digital transactions and enhancing transparency in financial dealings.

Ajibade et al. (2021) also investigated the role of POS transactions in driving economic development and found that businesses that accept POS payments experience higher sales volumes and improved financial management. The study suggested that expanding POS terminals could enhance financial deepening, particularly in rural areas with limited banking services.

However, some studies highlight challenges associated with POS transactions, such as network failures, security risks, and high transaction costs. Kama and Adigun (2021) noted that while POS adoption contributes to economic growth, inadequate infrastructure and cyber security threats pose risks to its effectiveness. This implies that policymakers need to address these challenges to maximise the economic benefits of POS transactions.

Theoretical Review

This study's theoretical foundation is anchored on Schumpeter's Theory of Innovation (1911) and Rogers' Diffusion of Innovation Theory (1962). These theories provide insights into how financial technology (FinTech) contributes to economic growth and how its adoption influences financial participation and economic performance.

Schumpeter's Theory of Innovation (1911)

The study is primarily guided by Joseph Schumpeter's (1911) Theory of Innovation, which posits that technological advancements and entrepreneurial activities drive economic growth. Schumpeter argues that innovation leads to "creative destruction", a process where new technologies and business models replace outdated ones, increasing efficiency and productivity. He identifies five key forms of innovation that contribute to economic development: Creating digital financial services like mobile money and POS transactions aligns with this innovation. FinTech enhances the efficiency of financial transactions, reducing costs and improving service delivery. The digitisation of financial services improves access to capital and credit, fostering business growth. The emergence of digital banking and mobile payment platforms disrupts traditional banking systems, leading to a more competitive financial sector.

Schumpeter's theory is highly relevant to this study as it explains how technological advancements in financial services contribute to economic growth. The expansion of mobile money transactions, ATM usage, and POS operations represents an innovation-driven transformation in Nigeria's financial sector, which enhances efficiency, financial access, and overall economic productivity. By analysing these FinTech innovations, the study aligns with Schumpeter's view that technological disruptions lead to long-term economic benefits.

Diffusion of Innovation Theory (1962)

Another critical theoretical underpinning of this study is the Diffusion of Innovation Theory, propounded by Everett Rogers (1962). This theory explains how new technologies, ideas, and practices spread within societies over time. The theory is relevant to this study as it explains how FinTech adoption spreads across different segments of the Nigerian population,

influencing financial inclusion and economic growth. The study investigates whether mobile money, ATMs, and POS transactions have gained widespread acceptance and their impact on Nigeria's Real Gross Domestic Product (RGDP). Additionally, understanding the barriers to adoption, such as regulatory challenges, cyber security concerns, and financial literacy gaps, aligns with Rogers' framework, highlighting factors that either accelerate or hinder innovation diffusion.

Both Schumpeter's Theory of Innovation and Rogers' Diffusion of Innovation Theory provide strong theoretical justifications for exploring the role of FinTech in Nigeria's economic growth. While Schumpeter's framework emphasises the economic transformation driven by technological disruptions, Rogers' theory explains the gradual adoption and integration of FinTech into society. These perspectives collectively help assess the impact of mobile money transactions, ATM usage, and POS operations on Nigeria's economic performance and identify strategies to maximise their benefits.

3.0   Methodology

This study employs a quantitative research design to investigate the impact of FinTech development on economic growth in Nigeria. The research utilises an Autoregressive Distributed Lag (ARDL) model, which is suitable for analysing both the short-run and long-run relationships between economic variables, mainly when dealing with mixed-order stationarity in time series data. The ARDL model allows for dynamic interaction analysis, making it an appropriate technique for assessing the influence of FinTech adoption on Nigeria's Real Gross Domestic Product (RGDP). The ARDL bounds testing approach will be employed to establish the presence of cointegration among the variables. The Error Correction Model (ECM) examines the speed of adjustment from short-run disequilibrium to long-run equilibrium.

3.1   Data Collection and Sources

The study relies on secondary data from 2010 to 2024, sourced from reputable institutions and reports, ensuring the credibility and accuracy of the dataset. The key sources include:

i.   Central Bank of Nigeria (CBN) Reports and Statistical Bulletins – Providing data on mobile money transactions, ATM usage, and POS operations.
ii.   National Bureau of Statistics (NBS) Publications – Offering macroeconomic indicators, including RGDP and financial sector statistics.
iii.   World Bank Development Indicators – Supplementing data on Nigeria's economic performance and financial inclusion trends.
iv.   FinTech Industry Reports and Publications – Delivering insights from industry analysts, including regulatory changes, investment trends, and digital payment adoption.

3.2   Data Analysis Software

The econometric analysis is conducted using EViews software, a widely used Statistical tool for time series modelling. EViews facilitated data transformation, estimation, and visualisation, ensuring accurate and efficient processing of econometric techniques.

3.3   Estimation Technique

The study conducted the following econometric procedures:

i. Stationarity Test: The Augmented Dickey-Fuller (ADF) test and Phillips-Perron (PP) test will be applied to determine the order of integration of the variables.
ii. Lag Length Selection: The Akaike Information Criterion (AIC) and Schwarz Bayesian Criterion (SBC) will guide optimal lag selection for the ARDL model.
iii. ARDL Bounds Test: This will establish whether a long-run relationship exists between FinTech variables and economic growth.
iv. Error Correction Model (ECM): If cointegration is confirmed, the ECM will estimate the speed of adjustment toward equilibrium.
v. Diagnostic Tests: To ensure the reliability of findings, the model will undergo serial correlation, heteroscedasticity, normality, and stability tests.

3.4   Model Specification

The econometric model for this study is specified as:

Functional relationship

RGDP = f(MMT, ATM, POS) …………………………….…………...............1

However, the econometric form of the model is specified as;

$$RGDP_t = \beta0_t + \beta1MMT_t + \beta2ATM_t + \beta3POS_t + \mu_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots..\ldots..2$$

Where:

RGDP   = Real Gross Domestic Product

MMT   = Mobile Money Transactions

ATM   = ATM Usage

POS   = POS Operations

$\beta0$ = Intercept
$\beta1, \beta2, \beta3$ = Coefficient of the parameter estimates
μ_t = Error Term

RESULTS AND DISCUSSIONS

Table 1: Summary of Descriptive Statistics

	RGDP	MMT	ATM	POS
Mean	55157.89	4.917340	1.580009	10.11167
Std. Dev.	16797.47	0.826328	0.160857	6.851667
Skewness	-0.419912	0.755342	0.595208	-0.458733
Kurtosis	1.696208	2.190377	2.085884	1.503816
Jarque-Bera	2.405179	2.937656	2.252699	3.080312
Probability	0.300415	0.230195	0.324215	0.214348
Observations	24	24	24	24

Source: Researcher's Compilation (2024) Employing E-Views 12

This table presents descriptive statistics for four variables (RGDP, MMT, ATM, and POS), each with 24 observations. RGDP exhibits considerable variability with a mean of 55157.89 and a standard deviation 16797.47. This suggests that the actual economic output varies significantly across the observed periods. The negative skewness of -0.42 indicates a slight concentration of data points above the mean, with a tail extending towards lower RGDP values. This suggests periods of economic downturn or slower growth. The kurtosis of 1.70, being less than 3, indicates a platykurtic distribution, meaning the distribution is flatter and has thinner tails compared to a normal distribution, implying fewer extreme values.

ATM transactions exhibit a mean of 1.58 and a very low standard deviation of 0.16. This extremely low standard deviation signifies minimal variability in ATM transaction volumes across the observations. This could indicate consistent usage patterns or a saturation of ATM usage within the studied context. The positive skewness of 0.60 suggests a concentration of data points at lower transaction volumes, with a tail extending towards higher volumes. The kurtosis of 2.09 also points to a platykurtic distribution.

POS (Point of Sale Transactions) has the highest mean (10.11) and the most significant standard deviation (6.85) among the four. The high standard deviation indicates substantial variability in POS transaction volumes, suggesting fluctuations in consumer spending or adoption of POS systems. The negative skewness of -0.46 indicates a concentration of data points at higher transaction volumes, with a tail extending towards lower volumes. The kurtosis of 1.50 indicates a platykurtic distribution.

MMT has a mean of 4.92 and a relatively low standard deviation of 0.83. This lower standard deviation signifies less variability than RGDP, suggesting that mobile money transaction volumes are relatively stable across the observed periods. The positive skewness of 0.76 indicates a concentration of data points at lower transaction volumes, with a tail extending towards higher volumes. This might suggest that while most periods show moderate MMT activity, some periods have significantly higher transaction volumes. The kurtosis of 2.19 indicates a platykurtic distribution, similar to RGDP.

Across all variables, the Jarque-Bera test probabilities (p-values ranging from 0.21 to 0.32) are all above the conventional 0.05 threshold. This leads us to fail to reject the null hypothesis of normality, suggesting that the distributions of all four variables are approximately standard.

Table 2: Summary of Unit Root Test Results

Variable	ADF Test Statistics	5% critical value	P-Value	Order of integration	Remark
RGDP	-17.74479	-3.040391	0.0000	I(0)	Stationary
MMT	-3.267364	-3.004861	0.0293	I(1)	Stations
ATM	-3.567148	-3.004861	0.0155	I(1)	Stationary
POS	-2.310529	-1.957204	0.0232	I(1)	Stationary

Source: Researcher's Computation (2024) Employing E-Views 12

The result above shows RGDP to be stationary at levels (i.e. integrated of order zero). In contrast, the other variables (MMT, ATM and POS) are all found to be stationary at the first difference (i.e. integrated of order one).

Table 3: Summary of Cointegration Test

F-Bounds Test		Null Hypothesis: No levels of relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	15.53219	10%	2.37	3.2
K	3	5%	2.79	3.67
		2.5%	3.15	4.08
		1%	3.65	4.66

Source: Researcher's Computation (2024) Employing E-Views 12

From the table above, the computed F-statistics value of 15.53219 is more significant than the upper bound critical value of 3.67 at the 5% confidence level. Based on this, the null hypothesis of no long-run relationship is rejected at the 5% significance level, and it can be inferred that the variables are co-integrated. As such, there is a long-run equilibrium relationship between the variables of interest.

Table 4: REGRESSION RESULT

ECM Regression				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
CointEq(-1)*	-0.144543	0.013084	-11.04711	0.0000
R-squared	0.938878			
Adjusted R-squared	0.888869			
F-statistic	10.53641			
Prob(F-statistic)	0.002600			
Durbin-Watson stat	1.802008			
Long-Run				
MMT	-424811.3	475516.4	-0.893368	0.4013
ATM	2292601.	2573709.	0.890777	0.4026
POS	1178.612	1236.647	0.953071	0.3723

Source: Researcher's Computation (2025) Employing E-Views 12

This analysis finds a statistically significant short-run relationship and adjustment mechanism, as evidenced by the significant error correction term (CointEq(-1)* = -0.144543, p=0.0000), indicating a 14.45% correction of disequilibrium each period. The short-run model also has a good fit (R²=0.9389, Adj. R²=0.8889) and is statistically significant (F=10.53641, p=0.0026), with no autocorrelation issues (Durbin-Watson=1.802008).

The coefficient for MMT (-424811.3) indicates a *negative* long-run relationship with RGDP, suggesting that an increase in mobile money transactions is associated with a decrease in real GDP in the long run. Conversely, the coefficients for both ATM (2292601.) and POS (1178.612) indicate *positive* long-run relationships with RGDP, suggesting that increases in ATM and POS transactions are associated with increases in real GDP in the long run. However, none of the individual long-run relationships for MMT (-424811.3, p=0.4013), ATM (2292601., p=0.4026), or POS (1178.612, p=0.3723) are statistically significant, meaning there is no statistically reliable evidence of their long-run impacts on RGDP.

Post Estimation Tests

Table 5: Summary of Post-Estimation Tests

Test	F-Stat /Coefficient	Prob.
Normality Test	4.865233	0.0878
Serial Correlation (LM)	0.304029	0.7506
Heteroscedasticity	0.536248	0.8425

Source: Researcher's Computation (2024) Employing E-Views 12

From Table 5, the Jarque-Bera normality test shows that the residuals for this model are normally distributed at a 5% significance level, given that the probability value (0.0878) is more significant than 0.05. On the other hand, the serial correlation (LM) test shows that the model is free from serial or autocorrelation, as shown by their probability value (0.7506), which is greater than 0.05. Lastly, the result of the heteroscedasticity test shows no evidence of heteroscedasticity in the model, as evidenced by the probability value (0.8425) greater than 0.05.

Discussion of Findings

The ARDL analysis investigates the dynamic relationship between a dependent variable RGDP and three independent variables: MMT (Mobile Money Transactions), ATM (Automated Teller Machine Transactions), and POS (Point of Sale Transactions). The key finding regarding the short-run dynamics is the highly significant error correction term, denoted as CointEq(-1)*, with a coefficient of -0.144543 and a p-value of 0.0000. This negative sign is a hallmark of a properly functioning ECM. It signifies the existence of a feedback mechanism that corrects deviations from the long-run equilibrium. If the variables stray from their long-run relationship in one period, this negative coefficient pulls them back towards equilibrium in the next period. The coefficient value represents the speed of adjustment. It indicates that approximately 14.45% of the disequilibrium from the previous period is corrected in the current period. The extremely low p-value (essentially zero) is crucial. It provides strong statistical evidence that the error correction term significantly differs from zero, confirming a stable long-run

relationship (cointegration) between the variables. This is a critical condition for the ECM to be valid.

Meanwhile, the coefficient for MMT (-424811.3) suggests a negative long-run relationship with the dependent variable (RGDP); however, with a high p-value of 0.4013, this relationship is not statistically significant. This analysis does not provide statistically significant evidence of a long-run effect of mobile money transactions on the dependent variable.

Conversely, the coefficient for ATM (2292601) suggests a positive long-run relationship with the dependent variable; however, with a high p-value of 0.4026, this relationship is not statistically significant. Based on this analysis, we cannot confidently conclude that ATM transactions have a real and measurable long-run impact on RGDP.

The coefficient for POS (1178.612) suggests a positive long-run relationship with the dependent variable; however, with a high p-value of 0.3723, this relationship is not statistically significant. Based on this analysis, the long-run impact of POS transactions on the RGDP is not statistically significant.

The overall fit of the short-run model is assessed by the R-squared (0.938878) and Adjusted R-squared (0.888869), which are both relatively high. This indicates that the model explains a substantial portion of the variation in the dependent variable in the short run. The F-statistic (10.53641) and its associated p-value (0.0026) confirm the overall statistical significance of the short-run model. The Durbin-Watson statistic (1.802008) is close to 2, suggesting no serious autocorrelation in the residuals of the short-run model, which is a desirable property.

Conclusion

The study examined the relationship between FinTech development and Nigeria's economic growth by analysing the impact of Mobile Money Transactions (MMT), Automated Teller Machine (ATM) transactions, and Point of Sale (POS) transactions on Real Gross Domestic Product (RGDP) using the Autoregressive Distributed Lag (ARDL) model.

The key finding from the Error Correction Model (ECM) analysis confirms a stable long-run relationship (cointegration) between the dependent and independent variables. The significant negative coefficient of the error correction term (-0.144543, p-value = 0.0000) indicates a proper adjustment mechanism, where approximately 14.45% of deviations from long-run equilibrium are corrected in each period.

However, despite the observed relationships, the study found that the long-run effects of mobile money transactions (MMT), ATM usage, and POS transactions on economic growth were not statistically significant. The coefficients for MMT (-424811.3), ATM (2292601), and POS (1178.612) indicate respective negative and positive relationships with RGDP, but their high p-values (above 0.37) suggest a lack of statistical significance.

In the short run, the model explains a significant portion of the variations in economic growth, as shown by the high R-squared (0.938878) and Adjusted R-squared (0.888869). Additionally,

the F-statistic (10.53641, p-value = 0.0026) confirms the overall significance of the model. The Durbin-Watson statistic (1.802008) suggests no serious autocorrelation issues, reinforcing the model's robustness in the short run.

Thus, while the FinTech ecosystem in Nigeria shows a connection to economic growth, its long-term impact remains uncertain. This could be due to challenges such as regulatory bottlenecks, financial literacy gaps, limited infrastructure, and cyber security concerns that hinder the full potential of digital financial services.

Recommendations

1. **Enhancing Financial Literacy and Digital Awareness**

   - The government, financial institutions, and FinTech companies should implement targeted financial literacy programmes to educate businesses and individuals on the benefits of digital transactions.
   - Awareness campaigns should focus on increasing trust in mobile money, ATM, and POS transactions, particularly in rural areas.

2. **Regulatory and Policy Support**

   - Policymakers should create a balanced regulatory framework that fosters innovation while addressing cybersecurity risks and fraud concerns.
   - The Central Bank of Nigeria (CBN) and financial regulators should encourage FinTech adoption by simplifying licensing processes for digital financial service providers.

3. **Infrastructure Development**

   - Investments in financial infrastructure, such as expanding broadband access, improving network reliability, and deploying more ATMs and POS terminals, are critical for increasing FinTech penetration.
   - Public-private partnerships (PPPs) should be encouraged to bridge infrastructure gaps in remote and underserved areas.

4. **Strengthening the Security and Trust of Digital Transactions**

   - Since cybersecurity risks may discourage FinTech adoption, there is a need to strengthen digital security frameworks to reduce fraud and build public trust.
   - Financial institutions should integrate AI-powered fraud detection systems and multi-factor authentication mechanisms to protect user transactions.

5. **Encouraging FinTech-Enabled SME Growth**

- Small and Medium Enterprises (SMEs) are critical drivers of economic growth. Government-backed initiatives should support SMEs adopting FinTech solutions such as mobile banking, POS payments, and digital lending platforms to improve their business operations.
- Lower transaction fees and tax incentives could be introduced to encourage more businesses to transition to digital payments.

6. **Further Research and Data-Driven Policy Making**

- Future research should explore why FinTech transactions do not yet have a statistically significant long-term impact on Nigeria's RGDP.
- Additional variables, such **as** Internet banking usage, peer-to-peer lending, and blockchain-based financial services, should be analysed for a more comprehensive understanding of FinTech's role in economic growth.

References

Acha, I. A., Agu, O. A., & Nwude, C. E. (2020). ATM Usage and Cashless Economy: A Study of the Nigerian Financial System. *International Journal of Finance and Banking Studies*, 9(4), 25-40.

Adeniyi, O., & Omotayo, T. (2021). Mobile Money and Economic Growth in Nigeria: An Empirical Investigation. *African Journal of Economic Policy*, 28(3), 78-95.

Ajibade, A. A., Adeyemi, K., & Salawu, M. (2021). The Economic Impact of Digital Payments: Evidence from POS Transactions in Nigeria. *Journal of Monetary Economics*, 14(1), 101-119.

Beck, T., & Brown, M. (2019). Financial Inclusion and ATM Usage: An Analysis of Developing Economies. *World Bank Economic Review*, 33(2), 45–72.

Chukwu, O., Nwachukwu, C., & Okonkwo, F. (2021). ATM Transactions and Their Impact on Nigeria's Economic Growth. *International Journal of Banking and Finance*, 18(3), 45-62.

Demirgüç-Kunt, A., Klapper, L., Singer, D., & Ansar, S. (2020). The Global Findex Database 2020: Financial Inclusion and FinTech Adoption. *World Bank Group*.

Emefiele, G. (2021). The Role of Automated Teller Machines (ATMs) in Nigeria's Financial System. *CBN Economic and Financial Review*, 59(4), 1–15.

Jack, W., & Suri, T. (2016). The Long-Run Poverty and Gender Impacts of Mobile Money. *Science*, 354(6317), 1288–1292.

Kama, U. & Adigun, M. (2021). Cashless Policy and the Growth of Digital Payments in Nigeria: A Macroeconomic Perspective. *African Journal of Banking and Finance*, 12(1), 76-95.

Nwankwo, O., Amadi, A., & Okorie, P. (2020). Challenges of POS Adoption in Nigeria's Retail Sector. *Journal of Business and Finance Research*, 15(2), 98-114.

Onyeka, A. & Uchenna, O. (2022). The Impact of Digital Transactions on Nigeria's Economy: An Empirical Study. *African Economic Review*, 17(3), 215-230.

Ozili, P. K. (2020). Financial Inclusion and FinTech in Nigeria: Opportunities and Challenges. *Contemporary Economics*, 14(4), 230–245.

Sahay, R., Čihák, M., N'Diaye, P., & Barajas, A. (2020). The Promise of Fintech: Financial Inclusion in the Digital Age. *International Monetary Fund Working Paper*.