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Digital Financial Inclusion and Economic Development in Nigeria

Kareem, A. Afeez and Akinyede, Oyinlola Morounfoluwa (PhD)

Department of Finance, Redeemer's University, Ede Osun State, Nigeria.

Corresponding Author: Email: akinyedeo@run.edu.ng, and Phone: +2347069328922,

ABSTRACT

From 2002 to 2024, the study examined the effects of digital financial inclusion (automated teller machine (ATM) penetration, bank account ownership, bank branch penetration, and secure internet servers) on GDP per capita, poverty rate, and Human Development Index (HDI). The study used time-series data drawn from the Central Bank of Nigeria (CBN) Statistical Bulletin, the World Bank's World Development Indicators, and the UNDP Human Development Reports, applying an ex post facto research design. The varied order of integration of the variables led to the use of the Autoregressive Distributed Lag (ARDL) bounds testing approach. The Finance-Growth Theory, the Technology Acceptance Model, and the Technological Advancement Theory served as the foundation for the study. The findings of the ARDL limits test were equivocal for GDP per capita and verified long-term cointegration between the HDI and the poverty rate. Over time, ATM prevalence and bank account ownership had a favourable impact on HDI; however, bank branch penetration had a negative impact. Although correction was incredibly slow (ECM = -0.0684, p = 0.0919), ATM penetration was the only meaningful long-term poverty-reducing proxy (coefficient = -0.3967, p < 0.001). Because the dependent variables are lagged, the R2 values, which ranged from 93.06% to 99.83%, are partly mechanical. The study concludes that while digital financial inclusion has little impact on GDP per capita, it does contribute favourably to human development and the alleviation of poverty. Increasing rural digital infrastructure, improving financial literacy initiatives, reducing transaction costs, bolstering consumer protection, and implementing tailored interventions for marginalised people are among the recommendations.

Keywords: Digital financial inclusion, economic development, poverty, human development.

1.0 Introduction

The importance of digital financial inclusion has grown with the widespread adoption of mobile phones, increasing internet access, and advances in information and communication technology (ICT). These technological developments present numerous business opportunities for the financial industry and make it easier and less expensive to deliver financial services. Digital financial inclusion has attracted the attention of policymakers, financial institutions, and development organisations due to its ability to enhance financial systems and boost growth (Basnayake et al., 2024).

Digital financial services help people access credit, manage risk through insurance, build disciplined savings approaches, and participate in economic activities that generate wealth by pushing aside institutional and systemic constraints. Digital financial inclusion has become a major issue for both developed and emerging countries, covering a whole spectrum of financial offerings such as savings accounts, loans, credit options, insurance programs, and mobile-driven digital payment systems.

Delivering these services in ways that are accessible, cost-effective, and safe supports how financial resources are allocated and how financial intermediation occurs (Demirgüç-Kunt et al., 2018; Oleti, 2025) Digital platforms provide financial service users with straightforward access to financial systems, improving the overall quality of service delivery. Digital financial inclusion has expanded access to financial services in lower-income societies like Nigeria, especially by enabling rural residents to access them even when traditional banking isn't available.

Digital platforms also make transferring money more convenient and cheaper, which can help people escape poverty (Williams, 2025). Digital devices linked to financial institutions enable people to transmit, receive, and store money and to manage their financial data, thereby making financial operations run more efficiently and transparently (Pazarbasioglu et al., 2020).

1.2 Statement of the Problem

Notwithstanding the several efforts made by regulators and the digital Fintech industry, financial exclusion from formal systems remains persistent (Demirgüç-Kunt et al., 2018). As reported in the 2024 Global Findex, 1.7 billion adults lack access to formal financial services, mostly in developing countries. It is estimated that 350 million people in Sub-Saharan Africa are excluded from the formal banking system. In Nigeria, while the proportion of unbanked is falling (from 60 million in 2017 to 38 million in 2020), traditional solutions are failing to find a lasting solution.

Over the years, due to the introduction of numerous banking sector reforms and technological innovations, Nigeria's overall economic progress has been reflected in continuous improvements within the banking industry. However, there is an alarming decline in several key economic indicators such as HDI, GDP per capita, and poverty rate. Nigeria's GDP per capita fell from $3,088 in 2014 to $1,596 in 2023, highlighting economic instability and a decline in living standards. Nigeria has a low HDI score of 0.548 out of 1, notably failing in three aspects: income, education, and health.

Although most of the population believes that digital financial inclusion initiatives contribute to economic growth, evidence suggests otherwise. Several studies reveal that digital financial inclusion contributes to improved financial access and engagement, and thus economic growth (Demirgüç-Kunt et al., 2013; Rahman, et al, 2025; Meniago, 2025). This study examines economic development indicators including GDP per capita, HDI, and poverty rate, presenting empirical evidence supporting digital financial inclusion for sustainable economic development in Nigeria to aid policy debates.

1.3 Research Hypotheses

The following hypotheses were tested in null form:

$H0_1$: Digital financial inclusion has no significant impact on income per capita in Nigeria.

$H0_2$: Digital financial inclusion has no significant impact on the Human Development Index in Nigeria.

$H0_3$: Digital financial inclusion has no significant impact on the poverty rate in Nigeria

2.0 Conceptual review

2.1 Digital Financial Inclusion

Digital financial inclusion can be defined as the application of digital technologies to provide financially inclusive and affordable services to individuals and enterprises, particularly those excluded from traditional financial services (Shen et al., 2025). It has emerged as a key component of Nigeria's financial development and economic growth. Nigeria's efforts to address problems related to traditional banking led to the implementation of digital payment systems, with the Central Bank of Nigeria (CBN) taking steps to encourage their use to increase reliable, fast transactions.

Udeoghi and Hanzace (2018) defined digital payment as "the electronic transfer of funds through automated processes with minimum human intervention." This promoted the efficiency of transactions and financial intermediation by providing facilities for real-time interbank transfers, bill payments, and fund transfers (CBN, 2013). The launch of the eNaira in 2021 became another milestone in Nigeria's digitized economy, providing a digital version of the country's legal tender for safer transactions and value storing.

Digital financial inclusion means wider access to formal financial services through digital channels (Kattan-Rodríguez, 2025). It covers more than just payment systems, including savings, credit, and other financial services, usually at low costs, for underserved and unbanked populations. However, challenges such as weak digital infrastructure, limited access to smart gadgets, and low digital literacy remain.

Empirical evidence from Nigeria supports this view: Iriobe, Akinyede, and Iriobe (2017) found that financial literacy and financial inclusion significantly enhance entrepreneurship development in Nigeria, while Iriobe et al. (2017) showed that financial technology services have a significant positive effect on bank customers' satisfaction.

2.2 Theoretical Framework

This study employs three complementary theoretical lenses: Finance-Growth Theory, Technological Advancement Theory, and the Technology Acceptance Model (TAM). Together they provide a solid foundation for examining how digital financial inclusion connects with economic development in Nigeria, using indicators like GDP per capita, HDI, and poverty rate.

2.2.1 Finance-Growth Theory

Based on the Finance-Growth Theory initiated by Schumpeter (1911) and confirmed by McKinnon and Shaw (1973), a well-functioning financial system is a prerequisite to economic development and growth. The argument postulates that financial intermediaries can mobilize savings, allocate funds to productive uses, spread risk, and facilitate transactions (Levine, 2005). The theory positions financial development as an active factor that accelerates growth rather than just a passive outcome. Digital financial inclusion is understood as a relatively new episode of financial development, enabled by increased ATMs, bank accounts, bank branches, and secure internet servers. According to Beck, Demirgüç-Kunt, and Levine (2007) and Greenwood and Jovanovic (1990), improved access to financial services increases economic activity (GDP per capita), human development (HDI), and alleviates poverty by facilitating saving and investment among poor households.

2.2.2 Technological Advancement Theory

Based on the research of Solow (1956) and Romer (1990), the Technological Advancement Theory highlights technical innovation as the main driver of economic growth. Digital technologies such as internet banking, mobile banking, ATMs, and secure digital platforms have innovated the supply and demand of financial services. Schumpeter's (1911) "creative destruction" theory argues that new technological innovations continually disintegrate existing structures while creating new channels for growth. This pattern appears in digital financial inclusion when more accessible, cheaper, and more efficient digital platforms replace rigid and exclusive banking infrastructures, leading to the democratization of financial access for previously excluded segments of the population (Arner, Buckley, & Zetzsche, 2018).

2.2.3 Integration of Theories

The three theories cohere to form a comprehensive understanding of digital financial inclusion's impact on economic development. The Finance-Growth Theory provides macroeconomic discussions on how financial development supports economic growth. The Technological Advancement Theory explains how digital technologies disrupt traditional financial arrangements and open new pathways for productivity and income enhancements. The Technology Acceptance Model addresses behavioral determinants influencing technology uptake. Together, they ratify the hypothesis that digital financial inclusion positively influences Nigeria's economic development.

2.3 Empirical Review

This section reviews empirical studies examining the relationship between digital financial inclusion (DFI) and the three dimensions of economic development

examined in this study: GDP per capita, Human Development Index (HDI), and poverty rate.

2.3 Empirical Review

2.3.1 Digital Financial Inclusion and GDP Per Capita

Evidence from empirical work examining the relationship between digital financial inclusion and GDP per capita appears inconsistent. Dadzie, Haywood-Dadzie, and Nambie (2023) showed that financial inclusion and investment exhibit a relatively high positive association with overall growth in Africa. Chinoda and Kapingura (2023) found that digital financial inclusion significantly and positively affects growth through better financial intermediation and lower transaction costs. Conversely, Eseyin, Okoh, and Olopade (2023) found a short-term positive influence of digital payments on growth in Nigeria, but the long-term effect was lower and statistically insignificant, attributing this to low digital literacy, loose regulatory regimes, and weak infrastructure.

Ahmad et al. (2021) showed GDP per capita moves up with financial inclusion in developing countries, emphasizing that complementary policies matter. Kim, Yu, and Hassan (2018) studied OIC countries and found financial inclusion supports economic growth, especially through improved credit access and savings mobilization. Arcand, Berkes, and Panizza (2015) provided a cautionary angle, suggesting financial development helps growth only up to a point, beyond which financial instability becomes a risk.

2.3.2 Digital Financial Inclusion and Human Development Index (HDI)

Most papers tend to report a positive connection between digital financial inclusion and HDI. Chika, et al (2025) found digital finance has a benefit on commercial bank deposits in rural Nigeria but it is statistically negligible. Chukwu

et.al (2024) concluded that financial technology affects economic development positively using HDI as the measure. Demirgüç-Kunt et al. (2020) argued that achievements in human development are experienced alongside advances in financial development, especially in emerging economies. Mushtaq and Bruneau (2019) showed that channels for risk mitigation, investment, and savings can positively promote human development outcomes.

Riley (2018) found that access to mobile money facilitates household consumption smoothing during economic downturns in Uganda. Munyegera and Matsumoto (2018) investigated how mobile money can alter household financial behavior in rural Uganda, achieving poverty reduction and improved credit access. Chakravarty and Pal (2013) found a causal influence of financial inclusion on human development indices in India, moderated by heterogeneous distribution of financial access.

2.3.3 Digital Financial Inclusion and Poverty Rate

Most evidence supports the view that digital financial inclusion reduces poverty. Ibitoye et al. (2025) examined how digital financial inclusion and poverty alleviation co-move in Nigeria, revealing that inadequate digital literacy, weak infrastructure, and high transaction costs hinder the financial inclusion agenda. Williams (2025) pointed to digital financial services reducing the cost of remittances, thereby lifting people out of poverty.

Demirgüç-Kunt and Klapper (2013) reported that financial inclusion was significantly correlated with poverty reduction across 140 nations. Banerjee, Duflo, Glennerster, and Kinnan (2015) found that access to microfinance helps poor households buffer risks and engage in higher-yield sub-sectors. Riley (2018) showed mobile money services are central to reducing relative poverty among rural households

in Uganda. Munyegera and Matsumoto (2018) discovered mobile money has a positive effect on asset and savings accumulation, consequently alleviating poverty.

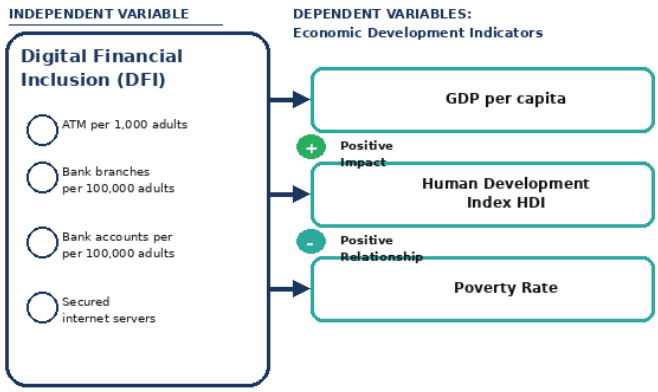


Fig.2.1: Conceptual Framework on Digital Financial Inclusion and Economic Growth in Nigeria.

Source: Author's Construction (2025)

3.0 METHODOLOGY

3.1. Research Design

The study adopted an ex post facto research design, utilizing secondary time-series data from 2002 to 2024. Digital financial inclusion indicators were sourced from the Central Bank of Nigeria Statistical Bulletin, while GDP per capita, poverty rate, and secured internet servers were obtained from the World Bank's World Development Indicators, and HDI from UNDP Human Development Reports.

3.2 Model Specification

The study adopted models from Chinoda and Kapingura (2023) and Ahmad et al. (2021). Digital financial inclusion was measured using ATMs per 100,000 adults,

bank branches per 100,000 adults, bank accounts per 1,000 adults, and secured internet servers. Economic development was measured using GDP per capita, HDI, and poverty incidence.

The models are formulated as:

$$GDPPC = \beta 0 + \beta 1ATMPA + \beta 2BBPA + \beta 3BAPA + \beta 4SIS + \mu$$

$$HDI = \beta 0 + \beta 1ATMPA + \beta 2BBPA + \beta 3BAPA + \beta 4SIS + \mu$$

$$POV = \beta 0 + \beta 1ATMPA + \beta 2BBPA + \beta 3BAPA + \beta 4SIS + \mu$$

Where GDPPC = Gross Domestic Product Per Capita, HDI = Human Development Index, POV = Poverty Gap, ATMPA = ATM per 100,000 adults, BBPA = Bank branches per 100,000 adults, BAPA = Bank accounts per 1,000 adults, SIS = Secured Internet Servers.

3.3 Estimation Techniques

The models were estimated using the Autoregressive Distributed Lag (ARDL) approach, which accommodates variables with mixed orders of integration. Diagnostic tests were carried out to ensure validity and reliability of results using EViews econometric software.

4.0 RESULTS AND DISCUSSION

4.1 Unit Root Test

The stationarity properties of the variables were examined using the Augmented Dickey-Fuller (ADF) test. The results are presented in Table 4.1.

Table 4.1: Augmented Dickey-Fuller (ADF) Unit Root Test Results

Variable	Level	First Difference	Order of Integration
GDPPC	-3.0329 (0.0473)**	0.1109 (0.9588)	I(0)
HDI	-3.3637 (0.0134)**	-3.0061 (0.0506)*	I(0)
POV	-1.5659 (0.3012)	-4.5476 (0.0021)***	I(1)

ATMPA	-1.5659 (0.4825)	-3.4159 (0.0221)**	I(1)
BAPA	-0.4492 (0.9842)	-4.1262 (0.0198)**	I(1)
BBPA	-2.0147 (0.2787)	-3.2519 (0.0309)**	I(1)
SIS	-1.7900 (0.3770)	-4.4000 (0.0030)***	I(1)

Source: Author's computation from EViews 9 output (2025)

Note: (*) Significant at 10%; (**) Significant at 5%; (***) Significant at 1%. Values in parentheses are p-values.

The Augmented Dickey-Fuller (ADF) test results revealed mixed orders of integration. GDP per capita and HDI are stationary at level I(0), while Poverty Rate, ATM Penetration, Bank Accounts, Bank Branches, and Secured Internet Servers are stationary after first differencing I(1). This combination justifies the use of the ARDL bounds testing approach.

4.2 ARDL Bounds Test for Cointegration

ARDL models, the bounds test was conducted to determine whether a long-run cointegrating relationship exists between digital financial inclusion and each measure of economic development. The results are presented in Table 4.2.

Table 4.2: ARDL Bounds Test Results

Model	F-Statistic	Critical Values (5%)	Decision
GDPPC	3.95	I(0): 2.86, I(1): 4.01	Inconclusive
HDI	4.63	I(0): 2.86, I(1): 4.01	Cointegration
POV	13.49	I(0): 2.86, I(1): 4.01	Cointegration

Source: Author's computation from EViews 9 output (2025)

The bounds test results revealed a mixed picture. For HDI, the F-statistic of 4.63 exceeds the upper bound critical value, confirming long-run cointegration. For Poverty Rate, the F-statistic of 13.49 substantially exceeds the upper bound, providing strong evidence of cointegration. For GDP per capita, the F-statistic of 3.95 falls within the inconclusive zone, meaning short-run effects should be interpreted with caution.

4.3 Model 1: Digital Financial Inclusion and GDP Per Capita

Table 4.3 presents the estimated ARDL model for GDP per capita (GDPPC). The ARDL model for GDP per capita exhibits excellent overall fit, with an R-squared of 99.83%, indicating that the model explains virtually all variation in GDP per capita. The F-statistic of 1467.91 is highly significant ($p < 0.001$).

Table 4.3: ARDL Model Results for GDP Per Capita

Section	Variable	Coefficient	Std. Error	t-Statistic	p-Value	Significance
Short-Run	GDPPC(-1)	0.697	0.1729	4.0313	0.0011	Significant
	ATMPA	-994.5655	2122.92	-0.4685	0.6462	Insignificant
	BAPA	6.9552	54.5384	0.1275	0.9002	Insignificant
	BAPA(-1)	205.8806	71.3437	2.8858	0.0113	Significant
	BBPA	1290.1332	7214.6	0.1788	0.8605	Insignificant
	SIS	33.7839	17.2785	1.9556	0.0704	Insignificant
	C	37190.22	42884.9	0.8672	0.3995	Insignificant
Long-Run	ATMPA	-3282.3262	8689	-0.3777	0.7109	Insignificant
	BAPA	702.4139	199.502	3.5208	0.0031	Significant
	BBPA	4257.7766	25517.1	0.1668	0.8697	Insignificant
	SIS	111.4955	284.056	0.3925	0.7002	Insignificant
	C	122737.442	96240.7	1.2753	0.2216	Insignificant

Model Diagnostics

Statistic	Value
ECM(-1) Coefficient	-0.3030 (p = 0.1001)
R-squared	0.9983
F-statistic	1467.91 (p < 0.001)
Durbin-Watson	1.86

Source: Author's computation from EViews 9 output (2025)

Source: Author's computation from EViews 9 output (2025)

The ARDL model for GDP per capita exhibits excellent overall fit with R-squared of 99.83%. In the long run, only bank account ownership shows a statistically significant positive relationship with GDP per capita (coefficient = 702.41, p = 0.0031). ATM penetration, bank branch penetration, and secure internet servers show

no significant long-run effect. The ECM(-1) coefficient of -0.3030 (p = 0.1001) indicates no robustly confirmed long-run relationship.

4.4 Model 2: Digital Financial Inclusion and Human Development Index (HDI)

Table 4.4 presents the estimated ARDL model for the Human Development Index (HDI). The ARDL model for HDI exhibits excellent fit, with an R-squared of 99.74%. The F-statistic of 761.64 is highly significant (p < 0.001). The Durbin-Watson statistic of 2.23 indicates no significant serial correlation.

Table 4.4: ARDL Model Results for Human Development Index

Section	Variable	Coefficient	Std. Error	t-Statistic	p-Value	Significance
Short-Run	HDI(-1)	0.6496	0.0824	7.8798	0	Significant
	ATMPA	0.000955	0.00029	3.3281	0.005	Significant
	BAPA	-0.000003	7E-06	-0.4965	0.6273	Insignificant
	BBPA	-0.00296	0.00079	-3.7666	0.0021	Significant
	SIS	-0.000028	1.1E-05	-2.6984	0.0173	Significant
	C	0.1852	0.0403	4.5934	0.0004	Significant
Long-Run	ATMPA	0.0027	0.0004	7.1524	0	Significant
	BAPA	0.000017	5E-06	3.7412	0.0022	Significant
	BBPA	-0.0084	0.0021	-4.0837	0.0011	Significant
	SIS	-0.000037	3.1E-05	-1.1859	0.2554	Insignificant
	C	0.5285	0.0135	39.2882	0	Significant

Model Diagnostics

Statistic	Value
ECM(-1) Coefficient	-0.3504 (p = 0.0008)
R-squared	0.9974
F-statistic	761.64 (p < 0.001)
Durbin-Watson	2.23

Source: Author's computation from EViews 9 output (2025)

The ARDL model for HDI exhibits excellent fit with R-squared of 99.74%. The ECM(-1) coefficient of -0.3504 (p = 0.0008) confirms significant long-run cointegration. In the long run, ATM penetration (0.0027, p < 0.001) and bank account

ownership (0.000017, $p < 0.01$) show positive and statistically significant effects on HDI. However, bank branch penetration shows a significant negative long-run effect (-0.0084, $p = 0.0011$), suggesting traditional banking infrastructure is concentrated in urban areas, limiting rural access

4.5 Model 3: Digital Financial Inclusion and Poverty Rate

Table 4.5 presents the estimated ARDL model for the poverty rate. The ARDL model for poverty rate exhibits good fit, with an R-squared of 93.06%. The F-statistic of 33.53 is highly significant ($p < 0.001$). The Durbin-Watson statistic of 1.997 indicates no significant serial correlation, which is close to the ideal value of 2.00.

Table 4.5: ARDL Model Results for Poverty Rate

Section	Variable	Coefficient	Std. Error	t-Statistic	p-Value	Significance
Short-Run	POV(-1)	0.9316	0.038	24.5132	0	Significant
	ATMPA	-0.0271	0.0153	-1.7746	0.0963	Insignificant
	BAPA	0.000166	7.4E-05	2.2551	0.0395	Significant
	BBPA	0.0449	0.0386	1.1655	0.262	Insignificant
	SIS	-0.000937	0.000351	-2.6719	0.0174	Significant
	C	0.8337	0.6861	1.2152	0.2431	Insignificant
Long-Run	ATMPA	-0.3967	0.0702	-5.653	0	Significant
	BAPA	0.0024	0.0023	1.0588	0.3064	Insignificant
	BBPA	-0.1064	0.5803	-0.1833	0.857	Insignificant
	SIS	-0.0137	0.0085	-1.6107	0.1281	Insignificant
	C	12.1853	3.5947	3.3898	0.004	Significant

Model Diagnostics

Statistic	Value
ECM(-1) Coefficient	-0.0684 (p = 0.0919)
R-squared	0.9306
F-statistic	33.53
Durbin-Watson	1.997

Source: Author's computation from EViews 9 output (2025)

The ARDL model for poverty rate exhibits good fit with R-squared of 93.06%. The ECM(-1) coefficient of -0.0684 (p = 0.0919) indicates extremely slow speed of adjustment, correcting only 6.84% of disequilibrium per annum. In the long run, only ATM penetration shows a statistically significant effect on poverty reduction (coefficient = -0.3967, p < 0.001), suggesting ATM availability enhances financial transactions and access to cash for low-income households.

4.6 Model Diagnostics

4.6.1 Normality Tests

Figures 4.1–4.4 (not shown here but available in the original document) present the normality test results for each model. The Jarque-Bera test p-values are summarised in Table 4.6.

Table 4.6: Summary of

	Normality Test Results		**Breusch-Godfrey LM**		**Breusch-Pagan-Godfrey**	
Model	Jarque-Bera	p-Value	F-Statistic	p-Value	F-Statistic	p-Value
GDPPC	4.18	0.1240	0.75	0.4917	0.83	0.5624
HDI	0.35	0.8400	1.29	0.3105	0.57	0.7717
POV	0.73	0.6955	0.59	0.5669	1.16	0.3790

Source: Author's computation from EViews 9 output (2025)

Normality tests confirmed residuals are normally distributed for all models. Breusch-Godfrey LM tests indicated no serial correlation. Breusch-Pagan-Godfrey tests indicated no heteroscedasticity.

4.7 Discussion of Findings

Impact on GDP Per Capita

The results reveal no statistically significant long-run effect of digital financial inclusion on GDP per capita in Nigeria, as the bounds test fell within the inconclusive zone. While bank account ownership showed a positive long-run coefficient, the

absence of confirmed cointegration negates evidence of a positive long-run effect. This is attributed to infrastructural deficiencies, weak regulations, and low digital literacy among users. These findings align with Eseyin et al. (2023), who found digital payments' long-term growth effects in Nigeria were statistically insignificant, and Arcand et al. (2015), who argued that financial development effects on growth diminish without supporting institutions. The result is consistent with Finance-Growth Theory and Romer's (1990) New Growth Theory, which postulate that financial development and technological advancement propel growth only with strong institutional regimes and regulations.

Impact on Human Development Index

Digital financial inclusion shows statistically and economically significant positive effects on HDI, making it the strongest among the three models. The bounds test confirms long-run cointegration between ATM penetration, bank account ownership, bank branch penetration, and HDI. Increased access to digital financial services contributes positively to human development by improving access to resources for health, investment, and education. These results align with Chukwu et al. (2024), Demirgüç-Kunt et al. (2020), found digital financial services significantly enhance human development outcomes in developing economies. However, the negative impact of bank branch penetration indicates banking services remain concentrated in urban areas, limiting rural access. This corroborates Chakravarty and Pal's (2013) observation that financial inclusion fosters human development only when access is equitable across the population.

Impact on Poverty Rate

The empirical results confirm a long-run cointegrating relationship between digital financial inclusion and poverty reduction. ATM penetration is the only indicator with a significant long-run effect, promoting financial transactions, liquidity, and cash access particularly important in Nigeria where cash remains the primary transaction

medium. This finding aligns with Oyasor (2026), who found digital financial inclusion substantially helped create equal opportunities for women to escape poverty, and Ibitoye et al. (2025), who revealed that ATM penetration significantly reduces poverty in Nigeria. The insignificant effects of secure internet servers, bank account ownership, and bank branch penetration may be due to high transaction costs, fraud, low digital literacy, and low affordability among the poor, consistent with Ogunsakin, et al (2026), who highlighted that financial literacy and trust significantly influence digital financial adoption among semi-urban residents.

Overall, results partially support Finance-Growth Theory and Technological Advancement Theory. Digital financial inclusion contributes positively to human development and poverty reduction, consistent with these theories' predictions. However, weak effects on GDP per capita suggest these theories may not fully account for the Nigerian context, highlighting the importance of institutional quality, infrastructure, and complementary investments particularly digital literacy programs in realizing developmental benefits.

5.0 CONCLUSION AND RECOMMENDATIONS

5.1Conclusion

This study concludes that digital financial inclusion has a differential impact on economic development in Nigeria, with the nature and magnitude varying across development indicators.

Digital financial inclusion has not consistently translated into sustained economic growth. The inconclusive bounds test and non-significant ECM coefficient suggest Nigeria has not yet reached the threshold at which digital financial inclusion contributes meaningfully to GDP per capita growth, likely due to infrastructural deficiencies, weak institutional frameworks, and low digital literacy.

On human development, digital financial inclusion has a strong and positive effect. The confirmed cointegration, significant ECM coefficient, and positive long-run effects of ATM penetration and bank account ownership indicate that expanding access to digital financial services enhances human development outcomes. However, the negative effect of bank branch penetration suggests banking infrastructure is unevenly distributed.

Digital financial inclusion contributes to poverty reduction primarily through ATM penetration. However, the extremely slow speed of adjustment suggests poverty-reducing effects take considerable time to materialize. The insignificance of other DFI proxies indicates infrastructure and adoption constraints significantly limit poverty reduction benefits.

Overall, the study concludes that digital financial inclusion is a necessary but not sufficient condition for economic development in Nigeria. Without complementary investments in infrastructure, digital literacy, institutional quality, and regulatory frameworks, developmental benefits will remain limited and unevenly distributed.

5.2 Recommendations

1. Expand digital financial infrastructure (ATM, telecommunications, internet services) to rural areas.
2. Eliminate or reduce costs and charges to drive adoption and encourage digital financial activities.
3. Introduce digital financial literacy programs in rural communities using town hall meetings and radio training.
4. Increase cybersecurity architecture to prevent scams, fraud, and unauthorized transactions to build trust.

5. Provide targeted programs to ensure digital finance use and support for rural areas.

6. Implement effective policies ensuring the best digital platforms for easy access and usage.

AUTHOR CONTRIBUTIONS

KAREEM, ADEYEMI AFEEZ: Conceptualisation, Methodology, Formal Analysis, Investigation, Writing of Original Draft.

AKINYEDE, Oyinlola M): Conceptualisation (Supporting), Supervision, Review & Editing.

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