THE ROLE OF FINANCIAL INCLUSION IN ACHIEVING SDG 1 IN NIGERIA

Alade Ayodeji Ademokoya[1,*], Grace Abayomi Emmanuel[1], Shuaib Omotosho Alege[1]
[1]Kwara State University
***Corresponding author**: alade.ademokoya@kwasu.edu.ng; +2348034452151; ORCID: 0000-0002-7646-128X
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ABSTRACT

The impact of financial inclusion on SDG 1 (No Poverty) in Nigeria is examined in this study. The Human Development Index (HDI) is used to measure SDG 1, and the five indicators of financial inclusion taken into consideration are access to financial services, credit availability, use of digital financial services, use of financial services, and quality of financial services. The study used an ex-post facto design with time series data and the ARDL bounds testing approach from 2000 to 2023. Credit availability, digital financial services, and financial services usage have positive and statistically significant effects on human development, whereas access to financial services and quality of financial services are insignificant. The impact of inflation is adverse, indicating that macroeconomic stability is a vital aspect of SDG inclusion efforts. Therefore, it is advised that policies that increase the affordability, use, and suitability of financial services among low-income households be put into place as financial inclusion contributes more to the achievement of SDG 1 in Nigeria by way of credit, digital financial innovation and active use of financial services rather than merely having access to accounts.

1. Introduction

Adopted by the UN in 2015, the Sustainable Development Goals (SDGs) provide a fifteen-year plan for tackling intertwined social, economic, and environmental issues. It has become increasingly understood that one of the main vehicles for accomplishing the SDG of eradicating poverty in all of its forms is integrated financial systems (Alkire et al., 2020; Demirgüç-Kunt et al., 2017).

Financial inclusion involves providing people and businesses with reasonably priced financial services and products, such as credit, savings, insurance, and payments (Demirgüç-Kunt et al., 2017). It has historically been linked to both equitable growth and poverty alleviation, particularly in emerging economies with low financial inclusion (Sarma & Pais, 2011; Zehri et al., 2024). In Africa, digital and mobile money have revolutionized financial access, particularly for the unorganized sector, promoting more saving, broader credit availability, and more flexible transactions (Khan et al., 2022; Mhlanga & Dzingirai, 2025; Zehri et al., 2024).

Nigeria, Africa's largest economy and most populated nation (Niaz, 2022), continues to suffer from severe poverty and financial marginalization. A vast majority of the population is kept out of the formal financial system despite a number of legislative initiatives and this is primarily due to a lack of credit availability

and financial literacy. In an effort to improve access to and adoption of digital financial services, the Central Bank of Nigeria (CBN) developed the National Financial Inclusion Strategy (NFIS) in 2012 (Soyemi et al., 2020). This led to the growth of fin-tech businesses and mobile money services that provide financial services to low-income earners (Adewuyi & Akinyele, 2022; Central Bank of Nigeria [CBN], 2023).

Financial inclusion can reduce poverty by enabling the poor to save, invest and manage shocks, with evidence that financial access improves welfare and the sustainability of incomes and enterprises (Ifediora et al., 2022). Credit and digital finance support enterprise growth, employment and economic empowerment of disadvantaged groups (Togun et al., 2022; Zehri et al., 2024). Motivated by Nigeria's persistently high poverty, this study assesses the role of financial inclusion in advancing SDG 1.

1.2 Research Objectives

The study examines how financial inclusion contributes to SDG 1 in Nigeria. Specifically, it assesses the effects of access to financial services, credit availability, digital financial services, financial services usage and quality of financial services on SDG 1.

1.3 Research Hypotheses

The following hypotheses were tested:

H_{01}: Access to Financial Services does not significantly affect SDG 1 in Nigeria.

H_{02}: Credit Availability does not significantly influence SDG 1 in Nigeria.

H_{03}: Digital Financial Services do not significantly affect SDG 1 in Nigeria.

H_{04}: Financial Services Usage does not significantly affect SDG 1 in Nigeria.

H_{05}: Quality of Financial Services does not significantly affect SDG 1 in Nigeria.

2. Literature Review

2.1.1 Concept of Sustainable Development Goal 1 (SDG 1)

The SDGs are targets adopted by the 193 United Nations member states under the 2030 Agenda for Sustainable Development (Ademokoya & Abdullahi, 2019; Ademokoya, 2020; Alkire et al., 2020). SDG 1, the first of the 17 goals, seeks to eradicate extreme poverty, build social protection systems and widen access to basic services, making it central to development policy in countries such as Nigeria.

In Nigeria, progress on SDG 1 has been hampered by widening socio-economic disparities, high unemployment and poor access to finance. According to Omotayo (2023), the best method to reduce high levels of poverty in sub-Saharan Africa is to execute complementary policies on access to infrastructure, health, education, and money. Bringing excluded households into the formal financial system is thus a vital instrument for poverty reduction (Musa & Jimoh, 2020), particularly for at-risk groups such as women, youth and rural communities (Adebayo, 2024).

2.1.2 Financial inclusion

Financial inclusion is a development strategy that seeks to bring underserved populations into the formal financial system through relevant and affordable savings, credit, payment and insurance products (Okonkwo, 2021). Beyond access, it entails the effective use of these services to improve wellbeing, reduce vulnerability and support economic participation (Salami, 2020).

In Nigeria, the NFIS and related reforms on branchless banking, mobile money, digital channels and microfinance have widened access to financial services (CBN, 2022; Enhancing Financial Innovation & Access [EFInA], 2021), while fintech innovations have streamlined service delivery to previously marginalised groups (Ibrahim & Alhassan, 2024). These developments have been linked to poverty reduction through greater entrepreneurship, household welfare and economic participation (Uche & Enang, 2021). Following the literature, this study treats financial inclusion as a multidimensional construct with the five dimensions discussed below.

(a) Access to Financial Services

Access to financial services is the ability of individuals and firms to obtain appropriate and affordable financial services without physical, informational, cost or documentary barriers (Agada, 2021; Musa & Ocheja, 2022). Access empowers the poor, especially rural dwellers, women and informal workers, by opening opportunities to save, borrow, insure and participate in economic activity (Oyeleke, 2023). Although mobile and agent banking have improved rural access, low awareness and financial literacy continue to constrain inclusion in Nigeria (Effiom & Nwankwo, 2024; Musa & Ocheja, 2022).

(b) Credit Availability

Credit availability reflects the capacity of individuals and businesses to obtain loans from formal and non-traditional lenders, as shaped by lending policies, financial stability, creditworthiness and financial education (Akinmoladun, 2020). Credit maximizes income and resilience while facilitating investment and business development (Ajayi, 2022). However, low-income households and those living in rural regions are unable to obtain credit because of high interest rates, collateral requirements, and transaction expenses (Bello & Ogun, 2023; Chukwu, 2021), and digital lending is unable to remove these obstacles.

(c) Digital Financial Services

Financial products offered via mobile phone networks, the internet, ATMs, and point-of-sale (POS) terminals are referred to as digital financial services. These services are used to encourage financial inclusion, lower transaction costs, and increased efficiency (Kalu, 2023). Although digital literacy, a lack of infrastructure, and a lack of trust continue to be barriers to a full impact, digital financial services can make it possible for the underprivileged to access saving, payment, credit, and investment services, making them an essential tool for the inclusion of those at the bottom of the pyramid (Ajibola, 2021; Bature, 2024; Nwachukwu, 2022).

(d) Financial Services Usage

Financial services usage is the actual, consistent, and ongoing use of financial products that is, consumption rather than acquisition (Dangana, 2021) such as credit, savings, insurance, and electronic payments (Adeyemi, 2023). Certain characteristics of the consumer and their socioeconomic situation such as education, income level, gender, and faith in financial institutions determine usage (Adebayo, 2020; Okonkwo, 2022). The unbanked now have more transactions and savings because to digital access, but

utilization is still restricted because of sociocultural barriers and low levels of ICT literacy (Sulaiman, 2025).

(e) Quality of Financial Services

The degree to which banks or other financial service providers offer dependable, effective, accessible, and reasonably priced services that are appropriate for their clients is known as quality of financial service (Onwuka, 2022). The customer choice and usage decision would be influenced by the availability of information, reliability of information, staff competence and the ease of use of technology (Ahmed, 2020; Bello, 2023) while data security would be key to the digital channel choice(Ogunleye, 2024). Service quality is therefore a determinant of adoption and sustained use.

2.2 Theoretical Framework

The study adopts Sarma's (2012) Theory of Financial Inclusion, which defines inclusion as the extent to which all segments of the population can access the full range of financial services, and assumes that timely, affordable and equitable access improves welfare and economic outcomes.

The theory has been criticised as supply-driven, underemphasising quality, sustainability and actual use, as well as demand-side and institutional factors such as trust, financial literacy and digital divides that are salient in the informal economies of sub-Saharan Africa (Adegbite & Adelekan, 2022). It has nonetheless been widely applied, for example to mobile banking adoption in northern Nigeria (Lawal & Hassan, 2021), digital inclusion and micro-enterprise growth in Ghana (Mensah & Agyekum, 2023) and rural poverty alleviation (Bello & Olanrewaju, 2024). In this study, access to financial services (share of adults with a formal account) maps to the theory's accessibility or penetration dimension; financial services usage, measured by ATM density, maps to the availability of service points; and credit availability and digital financial services, which capture actual use of formal credit and electronic payments, map to the usage dimension. Sarma's (2012) original index did not include financial services quality (financial literacy as a proxy), which was added to make up for the demand side flaw in the idea. Each dimension is positively correlated with human growth, according to the theory, and the critique offers a framework for comprehending nonperforming aspects.

2.3 Empirical Studies

Using time series data and a VECM, Ogbonna et al. (2024) found that greater availability and use of financial services reduced poverty and improved growth in Nigeria, although household poverty was not considered.

Komolafe et al. (2024) showed that structured financial advisory services increased participation in formal finance in Nigeria but did not examine poverty effects. Also, Etudaiye-Muhtar (2024), using 2000–2022 data, found that financial inclusion reduced income inequality in Nigeria.

Applying VAR and Granger causality, Oyadeyi (2024) found that mobile and internet banking enhanced financial inclusion and growth in Nigeria, without capturing household poverty effects. Similalrly, Mabinuori et al. (2023) found that credit access alleviated poverty, although poor financial literacy and infrastructure limited its reach.

From a survey of 400 respondents across four geopolitical zones, Ogunode and Akintoye (2023) reported that FinTech extended access to previously excluded groups and increased economic activity, but macroeconomic effects were not measured.

Using NFIS survey data, Okonkwo and Ifeoma (2022) found that household use of bank accounts, credit and mobile money raised incomes and livelihoods, while digital inclusion received limited attention. Akinlo and Jonathan (2021) established that bank outreach and microfinance depth significantly reduced poverty and enhanced growth in Nigeria. Likewise, Soyemi et al. (2020) found a strong negative association between access to financial services and poverty in Nigeria over 2010–2020, with access also enhancing economic sustainability.

Using co-integration analysis for 1980–2018, Saidu and Marafa (2020) found that financial development reduced poverty through improved credit access, but did not consider digital inclusion.

In a survey of 600 smallholder farmers, Adegbite and Machethe (2020) documented gender gaps and limited access to formal finance, without addressing digital channels. Using mixed methods, Siano et al. (2020) showed that mobile banking can extend financial access to low-income and rural Nigerians, while noting that sustaining its impact remains challenging.

Osagie (2020), through interviews with rural residents and bank executives in Ogun State, concluded that financial inclusion can support inclusive development and poverty eradication, although effects were not quantified. More generally, the Nigerian evidence mainly revolves around one or several aggregate access indicators, with less focus on examining multiple dimensions of inclusion (digital services and service quality in addition to access) simultaneously, especially with respect to the welfare SDG 1 indicator. Our study aims to fill this gap.

3. Methodology

The study adopts an ex-post facto design using secondary annual data for 2000–2023 from the CBN and allied institutions. The population of interest comprises financially included individuals, including bank account holders, credit recipients, insurance policyholders and users of digital payments and mobile money. Financial inclusion is the independent variable, while SDG 1 (No Poverty), proxied by the HDI, is the dependent variable.

3.1 Model Specification

The model extends Soyemi et al. (2020), who related financial inclusion to sustainable development using loans to rural areas, rural demand deposits and bank branches:

$$\boldsymbol{HDI_t = \beta_0 + \beta_1 LRAt_t + \beta_2 DRA_t + \beta_3 BBRANCH_t + \mu_{it}} \quad \text{..... (1)}$$

Where:

HDI_t = Human Development Index

LRA_t = Loan to Rural Areas

DRA_t = Demand Deposit from the Rural Areas.

$BBRANCH_t$ = Number of Commercial Bank Branches

t = time-periodIn this study, these variables are replaced by five dimensions of financial inclusion: access to financial services (AFS), credit availability (CA), digital financial services (DFS), financial services usage (FSU) and quality of financial services (QFS). HDI proxies SDG 1, while inflation (INFR) and unemployment (UNR) are included as macroeconomic controls. The modified model is:

$$Y_t = f\ (AFS_t, CA_t, DFS_t, FSU_t\ QFS_t\ INFR_t\ UNR_t) \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (2)$$

$$HDI_t = \beta_0 + \beta_1 AFS_t + \beta_2 CA_t + \beta_3 DFS_t + \beta_4 FSU_t + \beta_5 QFS_t + \beta_6 INFR_t + \beta_7 UNR_t + \mu_{it} \ldots\ldots\ldots \quad (3)$$

Where:

HDI = Human Development Index (Dependent Variable)

AFS = Access to Financial Services, measured as the percentage of adults with an account at a formal financial institution (Independent Variable)

CA = Credit Availability, measured as the percentage of adults with credit from a formal financial institution (Independent Variable)

DFS = Digital Financial Services, measured as the total volume of electronic payment transactions (ATM, POS, web, mobile and NIBSS Instant Payment) in billions, sourced from the CBN Statistical Bulletin (CBN, 2024) (Independent Variable)

FSU = Financial Services Usage, measured as the number of automated teller machines (ATMs) per 100,000 adults (Independent Variable)

QFS = Quality of Financial Services, proxied by the financial literacy rate (%) (Independent Variable)

INFR = Inflation Rate (Control Variable)

UNR = Unemployment Rate (Control Variable)

β1-7 = The coefficient of AFS, CA, DFS, FSU, QFS, INFR, UNR

μ = Stochastic error term

t = time periods; and

f = Functional relationship

Because HDI is a composite of health, education and income rather than a direct poverty measure, its use as a proxy for SDG 1 requires justification. Firstly, SDG 1 targets poverty in all its forms (Target 1.2), and HDI captures deprivations in health, education and living standards that overlap substantially with multidimensional poverty (Alkire & Foster, 2011; Alkire et al., 2020). Secondly, Nigeria does not have a consistent annual series of data on poverty from 2000 to 2023. The national Multidimensional Poverty Index is only available starting in 2022 (NBS, 2022), while the HDI is available every year without interruption (UNDP, 2024). Headcount measures are based on inconsistent household surveys with different methodologies (NBS, 2020). Thirdly, comparability is maintained because HDI is the dependent

variable in Soyemi et al. (2020). The findings are interpreted as having an impact on human development, which is close to reducing poverty but not quite there.

3.2 Model Estimation Techniques

The ARDL approach is employed because it accommodates a mix of I(0) and I(1) variables and performs well in small samples (Narayan, 2005; Pesaran et al., 2001). Stationarity was first examined using the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) unit root tests (Gujarati & Porter, 2009).

The bounds test of Pesaran et al. (2001) was used to test for a long-run relationship. Had co-integration been found, an error correction model would have been estimated; otherwise, the analysis is restricted to a short-run ARDL model, since long-run estimates and an error correction term (ECT) would be inappropriate (Pesaran et al., 2001). As shown in Section 4.1, co-integration was not established, so a short-run ARDL model without an ECT was estimated. Model stability was assessed with the CUSUM and CUSUMSQ tests.

4. Data Presentation and Analysis

4.1 Descriptive Results

Table 1: *Summary Statistics of the Variables (DFS in Billions of Transactions)*

Variables	Mean	Std. Dev.	Min.	Max.
HDI	0.503632	0.031605	0.449	0.56
AFS	38.2175	6.378092	20.0	52.0
CA	3.6	1.324682	1.8	7.6
DFS	4.21	8.92	0.115	37.90
FSU	12.21653	4.472243	6.73	17.03
QFS	60.86467	12.44714	30.0	100.0
INFR	13.127	4.462298	5.386908	24.65955
UNR	4.099167	0.686878	3.07	5.874

Source: Authors' Computation (2026)

Table 1 shows that HDI is moderate and stable (mean = 0.504). Access to financial services (mean = 38.22; range 20–52) and credit availability (mean = 3.60; range 1.8–7.6) are uneven. Digital financial services averaged 4.21 billion transactions (range 0.115–37.90 billion) and, with financial services usage, display wide variation, while quality of financial services (30–100) indicates gaps in service delivery. Inflation fluctuates considerably (mean = 13.13), whereas unemployment is relatively stable (mean = 4.1%).

Table 2: *Correlation Analysis*

Variable	HDI	AFS	CA	DFS	FSU	QFS	INFR	UNR
HDI	1.0							
AFS	0.4972	1.0						
CA	0.298473	0.185684	1.0					
DFS	0.621331	0.705229	0.226224	1.0				
FSU	0.62092	0.168114	0.170875	0.222045	1.0			
QFS	0.375757	0.28712	0.280405	0.406871	0.194838	1.0		
INFR	0.383182	0.643623	0.186844	0.66368	0.16977	0.065745	1.0	
UNR	0.392632	0.215574	−0.10489	−0.02518	0.509494	0.06684	−0.038019	1.0

Source: Authors' Computation (2026) Using E-Views 12; HDI=Human Development Index, AFS=Access to Financial Services, CA=Credit Availability, DFS=Digital Financial Services, FSU=Financial Services Usage, QFS=Quality of Financial Services, INFR=Inflation, UNR=Unemployment

As Table 2 shows, HDI is positively correlated with all inclusion indicators, most strongly with DFS (r = 0.621) and FSU (r = 0.621), followed by AFS (r = 0.497), QFS (r = 0.376) and CA (r = 0.298). Inflation correlates moderately with HDI (r = 0.383) and strongly with DFS (r = 0.664) and AFS (r = 0.644), while unemployment correlates weakly with HDI (r = 0.393) and moderately with FSU (r = 0.509). Before controlling for other factors, both access and usage are thus associated with higher human development.

Table 3: *Augmented Dickey-Fuller Unit Root Results*

Variable	Level/Difference	ADF t-Statistic	p-Value	Conclusion	Order of Integration
HDI	First Difference	−6.1752	0.0003	Stationary	I(1)
AFS	Level	−4.6543	0.0060	Stationary	I(0)
CA	First Difference	−4.3060	0.0132	Stationary	I(1)
DFS	First Difference	−4.7370	0.0058	Stationary	I(1)
FSU	Level	−4.7294	0.0069	Stationary	I(0)
QFS	Level	−3.6360	0.0487	Stationary	I(0)
INFR	First Difference	−9.4851	0.0000	Stationary	I(1)
UNR	First Difference	−2.6006	0.0125	Stationary	I(1)

Source: Authors' Computation (2026)

The ADF results in Table 3 show that AFS, FSU and QFS are stationary at level, I(0), while HDI, CA, DFS, INFR and UNR are stationary after first differencing, I(1), all at the 5% level. No variable is I(2), which justifies the ARDL bounds approach for testing the long-run relationship.

Table 4: *ARDL Bounds Test Result (HDI Model)*

ARDL Bound Test		
Test Statistic	Value	K
F-Statistics	2.030752	7
Critical Value Bound		
Significance	I(0) Bound	I(1) Bound
10%	1.92	2.89
5%	2.17	3.21
2.5%	2.43	3.51
1%	2.73	3.90

Source: Authors' Computation (2026)

The F-statistic of 2.031 in Table 4 lies between the lower (1.92) and upper (2.89) bounds at 10%, making the result inconclusive at that level, and falls below the lower bound at the 5%, 2.5% and 1% levels. There is therefore no evidence of a long-run relationship, and neither an error correction model nor long-run coefficients are estimated; the coefficients in Table 5 are short-run effects.

4.2 Impact of Financial Inclusion on SDG 1 (No Poverty)

Table 5 reports the short-run ARDL estimates of Equation 3, the only model estimated, with HDI as the dependent variable; the bounds, diagnostic and stability tests in Tables 4, 6 and 7 all refer to this model. DFS enters in billions of transactions, so its coefficient measures the effect of an additional one billion transactions; this rescaling does not affect its t-statistic or p-value. HDI(-1) is the lagged dependent variable and should not be read as an error correction term.

Table 5: *Short-run ARDL Estimates (No Cointegration; ECT Not Estimated)*

Dependent Variable: D(Human Development Index)				
Variable	***Coefficients***	***Std. Error***	***t-Statistics***	***Prob.***
HDI(-1)	0.213472	0.184523	1.157000	0.2745
AFS	−0.000472	0.001650	−0.286000	0.7809
AFS(-1)	−0.001685	0.001010	−1.668000	0.1102
CA	0.005712	0.002031	2.814000	0.0159
DFS	0.008210	0.003220	2.550000	0.0268
FSU	0.002386	0.000950	2.512000	0.0283
QFS	−0.000145	0.000385	−0.378000	0.7124
INFR	−0.002956	0.001110	−2.663000	0.0215
UNR	0.016392	0.008984	1.824000	0.0893
C (constant)	0.368251	0.126840	2.903000	0.0132
R-squared	0.872145			
Adjusted R-squared	0.726438			
F-statistics	6.142001			
Prob(F-statistic)	0.002955			
Durbin-Watson stat	2.013254			
S.E. of regression	0.015991			

Source: Authors' Computation (2026)

The model explains 87.2% of the variation in human development ($R^2 = 0.872$), and is jointly significant ($F = 6.142$, $p = 0.003$). Financial services usage ($\beta = 0.002386$, $p = 0.0283$), digital financial services ($\beta = 0.008210$, $p = 0.0268$) and credit availability ($\beta = 0.005712$, $p = 0.0159$) have positive and significant effects on HDI.

By contrast, access to financial services (β = −0.000472 and −0.001685; p = 0.7809 and 0.1102) and quality of financial services (β = −0.000145, p = 0.7124) are insignificant, while unemployment (β = 0.016392, p = 0.0893) is significant only at 10%. Inflation has a significant negative effect (β = −0.002956, p = 0.0215). Credit, digital services and usage are thus the main drivers of human development, while macroeconomic instability constrains the poverty-reducing capacity of inclusion.

4.3 Post-Estimation Tests

Serial correlation and heteroskedasticity tests were conducted to validate the estimates (Table 6).

Table 6: *Serial Correlation and Heteroskedasticity Tests*

Model	**Breusch-Godfrey Serial Correlation Test**		**Breusch-Pagan-Godfrey Heteroskedasticity Test**	
HDI model	Obs*R-squared	10.49243	Obs*R-squared	9.440715
	Prob. Chi-Square(1)	0.1221	Prob. Chi-Square(11)	0.5813

Source: Authors' Computation (2026)

Both the Breusch-Godfrey test (p = 0.1221) and the Breusch-Pagan-Godfrey test (p = 0.5813) are unable to reject their null hypotheses at 5%, indicating the absence of heteroskedasticity and serial correlation in the residuals. As a result, the model is valid at 5%, and statistical inference and policy recommendations can be made using the estimated coefficients.

Parameter stability was assessed using the cumulative sum (CUSUM) and cumulative sum of squares (CUSUMSQ) of recursive residuals (Table 7).

Table 7: *CUSUM and CUSUMSQ Test Results*

Model	**Test Type**	**Equation Specification**	**Critical Bounds (5%)**	**Stability Conclusion**
HDI model	CUSUM	D(HDI) = HDI(-1) + AFS + AFS(-1) + CA + DFS + FSU + QFS + INFR + UNR + C	Lower = −0.948 Upper = 0.948	Statistic stays within bounds → No evidence of instability
HDI model	CUSUM of Squares	Same as above	Lower = 0.162 Upper = 0.948	Statistic stays within bounds → No evidence of instability

Source: Authors' Computation (2026)

Both the CUSUM and CUSUMSQ statistics remain within the 5% critical bounds throughout the sample, indicating stable coefficients and no structural breaks in the residual variance (Brown et al., 1975; Pesaran & Shin, 1999). The short-run effects of the inclusion variables on human development are therefore stable over the study period.

4.4 Discussion of Findings

Access to financial services has a negative but insignificant effect on human development (β = −0.000472 and −0.001685; p = 0.7809 and 0.1102), implying that access alone does not improve welfare. This is consistent with Akinlo and Jonathan (2021) and Soyemi et al. (2020), who note that access without use and a supportive institutional setting does not reduce poverty, and with Koomson et al. (2021), who found that access improves welfare only through financial literacy.

Credit availability has a positive and significant effect (β = 0.005712, p = 0.0159), suggesting that wider credit has improved welfare in Nigeria, in line with Akinlo and Jonathan (2021). This departs from Sarma and Pais (2011) and Nwokoye and Egbe (2020), who found that credit deepening mainly raises investment and growth rather than directly reducing poverty. As Adewuyi and Akinlo (2021) observe, high interest rates and collateral barriers may still limit benefits to the poorest households, implying larger gains if these barriers are addressed.

Digital financial services have a positive and significant effect (β = 0.00821, p = 0.0268): an additional one billion digital transactions raises HDI by about 0.008 points in the short run. This confirms Adeleye et al. (2020) and Oladapo and Okafor (2022) on the welfare gains of mobile banking and FinTech in Nigeria, and Koomson et al. (2021) and Ibrahim and Alagidide (2018) on the poverty effects of mobile money in sub-Saharan Africa.

Financial services usage also has a positive and significant effect (β = 0.002386, p = 0.0283), indicating that active use, rather than mere account ownership, generates welfare gains. This agrees with Okonkwo and Ifeoma (2022), Adeleye et al. (2020) and Ogbonna et al. (2024), but contrasts with Sarma and Pais (2011), who found usage to influence economic participation more than poverty.

Similarly, welfare benefits were negatively and insignificantly impacted by financial services quality (β = −0.000145, p = 0.7124), suggesting that no welfare advantages of service quality were observed during the study period. This is consistent with the findings of Adeleye et al. (2020), Ogbonna et al. (2024), and Koomson et al. (2017), who discovered that the informal sector's lack of infrastructure had a major detrimental effect. (2021).

Sarma's (2012) three indices accessibility, availability, and usage which are meant to advance welfare can be used to understand these. With a positive and significant coefficient of access to credit and digital financial services (proxy of actual utilization of formal credit and electronic payments) and financial services utilization (number of service points per person), the evidence unmistakably supports the proposed effect of availability and usage. According to Demirgüç-Kunt et al. (2017), digital finance seems especially well-suited to the provision of such inclusion when it comes to the welfare gains from use and access to services, obviously playing a role in lowering access and transaction costs and attracting the excluded.

The shortcomings mentioned in Section 2.2 are exposed by the two less significant dimensions. The idea that account ownership indicates inclusion is further undermined by the irrelevance of AFS (accessibility, or penetration) (Adegbite & Adelekan, 2022): the more dormant the accounts, the higher the penetration, the lower the welfare gains. QFS, using financial literacy as the proxy for the demand-side determinants omitted by the theory, failed to be significant because either penetration levels were too low (30-100 in Table 1) or the sensitivity of use to the determinants was so negligible that it was not statistically significant for the purpose of human development. Instead of disproving it, the findings actually validate the

applicability of the theory in the Nigerian context. Both penetration and quality are necessary but not sufficient, and number of accounts does not, rather than the number of accounts represents depth of use.

5. Conclusion and Recommendations

The study finds that financial inclusion has mixed short-run effects on human development and, by extension, SDG 1 in Nigeria. With F = 6.142, p = 0.003, and R2 = 0.872, the model is jointly significant. The availability of credit, the use of financial services, and digital financial services all have favorable and noteworthy implications. Both service quality and accessibility to financial services are negligible. While unemployment is good but only substantial at the 10% level, inflation has a significant negative impact. The results do not address long-run equilibrium or adjustment because the bounds test failed to find a long-run relationship. The anticipated welfare increases cannot be attained by merely increasing access; supportive institutions and policies, inexpensive credit, efficient utilization, and improved service quality are all required.

The following recommendations are made:

i. Access to banking is only the beginning Policy must be about more than access. The CBN and banks have to look into the affordability, accessibility and appropriateness of financial services with financial literacy programmes tailored for new users.
ii. Since credit bears a large weight, regulators should think about opening-up credit for poor households, smallholders and micro-enterprises in a fair manner, and reduce interest and collateral requirements.
iii. Given the advantages of digital financial services, the government and CBN should implement digital literacy programs that allow low-income households to save, transfer, and make payments digitally in order to bring mobile money, agent banking, and fin-tech to underserved and rural areas.
iv. Governments and development partners should incorporate financial service delivery into their social protection programs, and financial service providers should devise strategies to encourage low-income clients to use services regularly.
v. Because usage was unaffected by service quality, financial institutions should strive to enhance the quality and innovation of their offerings, and the CBN and NDIC should look for ways to protect consumers so that vulnerable groups can trust financial institutions more.
vi. Due to the detrimental effects of inflation, employment policy should be strengthened in order to restore income and welfare, and policy should aim to stabilize prices.

The limitation of this study include inconsistence yearly poverty data for Nigeria, as HDI was used to proxy SDG 1. Although HDI being a composite index of income, health, and education depicts better non-income part of human development than actual poverty reduction. Second, no long-run inferences were provided because of the short sample periods (2000-2023) and no co-integration present, this can be further explored.

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