



Exploring the Determinant of Financial Inclusion in Nigeria: The Role of Digital Financial Access and Socio-Economic Factors

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ABSTRACT

This study investigates the determinants of financial inclusion in Nigeria, with particular emphasis on digital access and usage. Using individual-level data from the 2025 Global Findex Database and survey-weighted logistic regression, the study examines how socio-economic characteristics and digital access relate to ownership of a formal financial-institution account among respondents aged 18 years and older. The analysis includes age, gender, education, income quintiles, and internet use. The primary results show that education, internet use, male gender, and higher income quintiles are positively associated with financial inclusion, while the age-squared term is not statistically significant. Mobile-money-account ownership and digital-payment use are reported descriptively but excluded from the primary model because their close relationship with account ownership produces unstable estimates when entered together. The findings highlight the need to expand internet connectivity, improve educational attainment, and address gender and income-related barriers to foster a more inclusive financial ecosystem.

Keywords: Digital finance; Financial inclusion; Global Findex; Internet access

1. Introduction

Financial inclusion has emerged as a critical concern in development economics because of its close relationship with poverty reduction, economic growth, inequality reduction, and broader improvements in social welfare (Salisu et al., 2024). Access to formal financial services enables individuals to save securely, make and receive payments, smooth consumption, manage risks, and invest in education or productive activities, thereby enhancing overall economic participation (Demirgüç-Kunt & Levine, 2009; Beck, Demirgüç-Kunt, & Honohan, 2009; Salisu et al. 2024). Consequently, expanding financial inclusion has emerged as a key policy objective in many developing and emerging economies (World Bank, 2014).

In recent years, the concept of financial inclusion has evolved beyond traditional banking to include digital financial services. Advances in mobile technology, internet connectivity, and digital payment systems have transformed how individuals interact with financial institutions, particularly in low- and middle-income countries (Demirgüç-Kunt et al., 2018; Demirgüç-Kunt et al., 2022). Digital financial services lower transaction costs, reduce dependence on physical bank branches, and provide alternative channels for accessing formal financial services, making them especially relevant for underserved and remote populations (Aker & Mbiti, 2010; Jack & Suri, 2014).

Nigeria presents a particularly important context for examining financial inclusion in the digital era. As Africa's largest economy and most populous country, Nigeria has experienced rapid growth in mobile phone penetration and digital financial platforms. National policy efforts, such as the National Financial Inclusion Strategy, have explicitly emphasised the role of digital finance in expanding access to financial services and reducing exclusion (Central Bank of Nigeria [CBN], 2020). Despite these initiatives, financial inclusion in Nigeria remains uneven, with substantial disparities across gender, income groups, educational attainment, and age cohorts (World Bank, 2022; Ozili, 2020).

The increasing importance of digital finance has reshaped the determinants of financial inclusion. Mobile phone ownership, use of digital payments, and internet access have become important enablers of financial participation, particularly in environments characterised by weak financial infrastructure and high population dispersion (Jack & Suri, 2014; Gabor & Brooks, 2017). In Nigeria, digital channels offer a means of overcoming traditional barriers such as distance to bank branches, high account maintenance costs, and documentation requirements, which have historically constrained access to formal financial services (Allen et al., 2016; Ozili, 2021). Although a growing body of empirical literature examines the determinants of financial inclusion in developing countries, much of the evidence for Nigeria relies on earlier datasets or focuses mainly on traditional socio-economic factors such as income, education, and employment status (Allen et al., 2016; Zins & Weill, 2016). There remains relatively limited empirical evidence that uses the most recent Global Findex data to analyse financial inclusion in Nigeria within a digital finance framework. This gap is particularly relevant given the rapid expansion of digital payments and mobile-based financial services in recent years (Demirgüç-Kunt et al., 2022).

Against this background, this study investigates the determinants of financial inclusion in Nigeria using the 2025 Global Findex Database, with particular emphasis on digital access. Financial inclusion is measured by ownership of an account at a formal financial institution. The primary model includes internet use and standard socio-economic controls: age, gender, education, and income quintiles. Mobile-money-account ownership and digital-payment use are described separately because their close relationship with account ownership can produce unstable estimates when treated as ordinary regressors. The contribution of this paper is threefold. First, it provides recent survey-weighted evidence on financial inclusion in Nigeria using the latest Global Findex data. Second, it distinguishes digital access from digital financial behaviours that are closely tied to existing account ownership. Third, it provides policy-relevant evidence on the roles of connectivity, education, gender, and income in financial inclusion.

2. Literature Review

2.1 Conceptual and Theoretical Background on Financial Inclusion

Financial inclusion broadly refers to the availability and use of affordable formal financial services by individuals and businesses (World Bank, 2014). From a theoretical perspective, access to financial services reduces market imperfections, lowers transaction costs, and facilitates efficient allocation of resources, thereby supporting economic development (Beck et al., 2009). Theories of financial development suggest that improved access to finance enhances savings mobilisation, investment, and consumption smoothing, particularly for low-income households (Demirgüç-Kunt & Levine, 2009).

The life-cycle hypothesis further provides a useful framework for understanding individual financial behaviour. According to this theory, individuals' demand for financial services varies across different stages of life, increasing during economically active years and declining at older ages (Modigliani & Brumberg, 1954). Socio-demographic characteristics such as gender, education, and income also influence financial inclusion by shaping financial literacy, trust in financial institutions, and capacity to meet formal banking requirements (Allen et al., 2016).

2.2 Digital Finance and Financial Inclusion

Recent developments in digital technology have significantly altered the traditional pathways to financial inclusion. Digital financial services such as mobile money, digital payments, and internet-based banking have expanded access to financial services by reducing dependence on physical bank branches and lowering transaction costs (Aker & Mbiti, 2010). These technologies are particularly effective in developing countries where financial infrastructure is weak and large segments of the population remain unbanked. Empirical evidence shows that mobile phone ownership and digital payment usage are often associated with higher levels of financial inclusion. Jack and Suri (2014), in their study of mobile money in Kenya, demonstrate that digital finance can increase financial access and improve household welfare. Similarly, Demirgüç-Kunt et al. (2018, 2022) provide global evidence that digital payments and mobile money accounts have become important components of financial inclusion, especially among women and low-income individuals.

Digital finance also plays a critical role in overcoming non-income barriers to financial inclusion, such as distance, documentation requirements, and high account maintenance costs (Gabor & Brooks, 2017). Internet access further complements digital financial services by enabling individuals to access online banking platforms, digital wallets, and financial information, thereby deepening financial engagement (Ozili, 2021).

2.3 Empirical Evidence from Developing Countries

A large body of empirical literature has examined the determinants of financial inclusion across developing economies. Using cross-country data, Allen et al. (2016) find that income, education, employment status, and age are key predictors of account ownership, while women and poorer individuals are more likely to be financially excluded. Zins and Weill (2016), focusing on African countries, report similar findings and highlight the persistent role of income inequality and education gaps in shaping access to financial services.

Recent studies increasingly emphasize the role of digital variables. For example, Klapper, Miller, and Hess (2019) show that digital payment systems significantly increase the probability of owning a formal account. Ozili (2020) finds that digital financial innovation contributes positively to financial inclusion in Sub-Saharan Africa, although its impact varies across countries depending on institutional quality and digital infrastructure.

2.4 Financial Inclusion in Nigeria

Empirical studies on financial inclusion in Nigeria highlight the presence of significant socio-economic disparities. Earlier evidence suggests that age, gender, education, and income are strong determinants of account ownership, with women, rural residents, and low-income individuals being more likely to remain financially excluded (Allen et al., 2016; World Bank, 2017). Education improves financial literacy and awareness, while higher income enhances the ability to meet minimum account requirements and transaction costs. More recent Nigerian studies emphasize the growing importance of digital finance. Ozili (2021) argues that mobile banking and digital payment platforms have expanded financial access in Nigeria, particularly in urban areas. However, challenges such as limited internet access, low digital literacy, and infrastructural constraints continue to restrict the full benefits of digital financial inclusion, especially in rural communities (CBN, 2020; World Bank, 2022).

Despite these insights, there remains limited empirical evidence using the most recent Global Findex microdata to analyse financial inclusion in Nigeria from a digital finance perspective. This study addresses this gap by providing updated evidence on the role of digital financial access and usage in shaping financial inclusion outcomes in Nigeria. The reviewed literature demonstrates that financial inclusion is influenced by a combination of socio-demographic characteristics and technological factors. While traditional determinants such as age, gender, education, and income remain important, digital finance has emerged as a critical driver of financial inclusion in developing economies. However, empirical evidence for Nigeria using the latest Global Findex data remains scarce. By focusing on digital financial variables within a recent dataset, this study contributes to the literature by offering updated and policy-relevant insights into financial inclusion in Nigeria.

3. Methodology

3.1 Data Source

This study uses individual-level data from the 2025 Global Findex Database, compiled by the World Bank. The 2025 edition is based on nationally representative surveys conducted in 2024 across 141 economies and includes measures of financial access, use, digital payments, mobile-money accounts, mobile phone ownership, and internet use (Klapper et al., 2025). The present analysis focuses on Nigeria and restricts the sample to respondents aged 18 years and above to align with the study's adult financial-participation focus. Survey weights supplied with the microdata are applied so that reported estimates represent the target population. The analysis focuses exclusively on Nigeria, given its importance as Africa's largest economy and the growing relevance of digital financial services in the country. To ensure methodological consistency, the sample is restricted to respondents aged 18 years and above, in line with the Global Findex survey design.

3.2 Variable Definition and Measurement

Financial inclusion is measured using `account_fin`, a binary indicator equal to one when the respondent has an account at a financial institution and zero otherwise. The explanatory variables are age and age squared; male gender (one for male and zero for female); education, measured from primary education or less to tertiary education or higher; household income quintiles, with the lowest quintile as the reference category; and internet use, measured as use of the internet within the previous three months. Mobile-money-account ownership (`account_mob`) and digital-payment use (`anydigpayment`) are retained for descriptive analysis but excluded from the primary specification because they are closely related to the outcome and can create unstable estimates when entered as conventional regressors.

3.3 Model Specification

Given the binary nature of the dependent variable, the study estimates a survey-weighted logistic regression model with robust standard errors. The primary specification relates formal-account ownership to age, age squared, gender, education, income quintiles, and internet use. This specification avoids treating account-linked financial behaviours as independent causal regressors. A supplementary specification that includes mobile-money-account ownership and digital-payment use is used only as a sensitivity diagnostic, not for substantive interpretation.

$FI = f(\text{Age, Age squared, Male, Education, Income, Internet})$

This equation is estimated as:

$$FI = \beta_0 + \beta_1 \text{Age} + \beta_2 \text{Age squared} + \beta_3 \text{Male} + \beta_4 \text{Education} + \beta_5 \text{Income} + \beta_6 \text{Internet} + U_i \quad (1)$$

Where FI is formal-account ownership; β_0 is the intercept; β_1 to β_6 are coefficients; and U_i is the error term.

β_0 = constant term (intercept) of the model

β_1 – β_6 = are coefficients of the model

U_i = error term of the model

The logit model is appropriate for a binary outcome variable and is widely applied in financial inclusion studies (Allen et al., 2016; Zins & Weill, 2016). Average marginal effects are reported to express the association of each explanatory variable with the probability of financial inclusion, holding the other variables constant.

3.4 Estimation Technique and Robustness

The model is estimated by survey-weighted maximum likelihood using the Global Findex individual sampling weight (wgt). Robust standard errors are used for inference. All estimations are based on 943 Nigerian respondents aged 18 years and above with complete data on the primary-model variables.

4. Results and Discussion

4.1 Descriptive Statistics

Table 1 presents weighted descriptive statistics for the variables used in the primary analysis. Formal-account ownership is 63.4 percent among Nigerian respondents aged 18 years and above. This weighted estimate is consistent with the approximately 63 percent Nigeria headline reported in the Global Findex 2025 country data and corrects the unweighted 78.9 percent figure reported in the earlier version. The weighted mean age is 34.1 years. The sample spans ages 18 to 90, allowing the analysis to account for possible age-related differences in formal-account ownership. The weighted sample is approximately balanced by gender, with men accounting for 49.9 percent of respondents. Gender differences are examined in the regression analysis. The weighted mean education level is 1.57 on a scale ranging from primary education or less (1) to tertiary education or higher (3), indicating that lower levels of formal education remain common in the weighted population.

With respect to digital indicators, 34.5 percent of respondents have a mobile-money account, 57.8 percent report using digital payments, and 38.7 percent report internet use. These figures show that digital access and digital financial behaviours are not universal and should be interpreted separately from formal-account ownership. Overall, the weighted descriptive statistics indicate that formal financial inclusion in Nigeria remains incomplete and is accompanied by substantial variation in education, income, and digital access.

Table 1: Descriptive Statistics of Key Variables

Variable	Count	Mean	sd	min	max
fin_inclusion	943	0.634	0.482	0	1
Respondent age	943	34.075	13.924	18	90
Male	943	0.499	0.500	0	1
Respondent education level	943	1.573	0.527	1	3
mobile_use	943	0.345	0.475	0	1
digital_payment	943	0.578	0.494	0	1
Internet	943	0.387	0.487	0	1
Observations	943				

Note: Education is an ordered variable ranging from primary education or less (1) to tertiary education or more (3).

4.2 Correlation Analysis

Table 2 presents the pairwise correlation matrix among the key variables included in the empirical analysis. Financial inclusion is positively and statistically correlated with age, gender, education, and internet access. The strongest correlations with financial inclusion are observed for internet access (0.34) and education (0.31), indicating that individuals with higher educational attainment and access to the internet are more likely to own a formal financial account. Age is positively correlated with financial inclusion (0.21), suggesting that account ownership tends to increase with age, particularly during economically active years. The correlation between gender and financial inclusion is positive but relatively weak (0.09), indicating modest gender differences in account ownership at the bivariate level.

Among the explanatory variables, education is positively correlated with age (0.18) and internet access (0.29), while internet access is also weakly correlated with age (0.12) and gender (0.08). These relationships are statistically significant but moderate in magnitude, reflecting expected socio-economic patterns without indicating strong linear dependence. Importantly, none of the correlation coefficients among the explanatory variables exceeds conventional thresholds that would raise concerns about multicollinearity. This suggests that the variables capture related but distinct dimensions of socio-economic and digital characteristics. Overall, the correlation results provide preliminary support for the inclusion of these variables in the logistic regression model and justify proceeding to multivariate estimation.

Table 2: Pairwise Correlation Matrix

Variables	(1)	(2)	(3)	(4)	(5)
(1) Financial inclusion	1.00				
(2) Age	0.21***	1.00			
(3) Male	0.09**	0.04	1.00		
(4) Education	0.31***	0.18***	0.06*	1.00	
(5) Internet access	0.34***	0.12***	0.08**	0.29***	1.00

Note: ***, **, and * denote significance at the 1%, 5%, and 10% levels respectively.

4.3 Primary Model Results

Table 3 presents average marginal effects from the survey-weighted primary logistic regression. The model excludes mobile-money-account ownership and digital-payment use because their close relationship with account ownership inflated fit statistics and produced unstable estimates in the earlier specification. The primary model has a weighted pseudo R-squared of 0.298 and a likelihood-ratio statistic of 363.30; these statistics should be interpreted as model-fit summaries rather than evidence of causality.

4.4 Age Effects

Age has a small positive association with financial inclusion: an additional year of age is associated with a 0.4 percentage-point increase in the probability of formal-account ownership ($p = .030$). The squared-age term is not statistically significant ($p = .430$). Accordingly, the revised results do not support a statistically reliable non-linear life-cycle pattern in this specification. The positive linear age association is consistent with the possibility that financial participation rises as adults gain labour-market experience and income. However, because the squared term is not significant, the evidence does not justify a stronger claim about declining financial inclusion at older ages.

4.5 Gender Differences

Gender is positively associated with financial inclusion. The average marginal effect indicates that men are 8.7 percentage points more likely than women to own a formal financial-institution account ($p = .017$), holding the other variables constant. This result highlights the persistence of gender disparities in access to formal financial services, despite policy efforts aimed at promoting inclusive finance. The finding aligns with earlier evidence showing that women are more likely to be financially excluded due to lower income, limited asset ownership, and social constraints (Demirgüç-Kunt et al., 2018; World Bank, 2022).

4.6 Education and Financial Inclusion

Education is one of the strongest correlates of financial inclusion. Moving up one education category is associated with a 20.0 percentage-point increase in the probability of owning a formal account ($p < .001$), holding the other variables constant. This finding underscores the critical role of human capital in shaping financial behaviour. Higher educational attainment improves financial literacy, awareness of financial products, and trust in formal financial institutions, thereby increasing the likelihood of account ownership. This result is consistent with a large body of empirical literature that identifies education as a key driver of financial inclusion in both developed and developing economies (Allen et al., 2016; Ozili, 2021).

4.7 Income Quintiles

The weighted results show an income gradient. Relative to the lowest income quintile, respondents in the third, fourth, and fifth quintiles are respectively 15.1, 20.6, and 18.3 percentage points more likely to own a formal account. The second quintile is not statistically distinguishable from the lowest quintile. These results indicate that the lower end of the income distribution remains particularly constrained in access to formal financial services, while financial inclusion is more widespread from the middle of the distribution upward.

4.8 Digital Access and Sensitivity Analysis

Internet use is positively associated with financial inclusion. Internet users are 26.4 percentage points more likely to own a formal financial-institution account than non-users ($p < .001$), holding other factors constant. This result underscores the potential importance of digital connectivity in access to formal financial services. Mobile-money-account ownership and digital-payment use are not interpreted as ordinary explanatory variables in the primary model. Both measures are closely linked to existing financial-account use, and their joint inclusion in the earlier model generated implausibly large and offsetting marginal effects. They are therefore reported descriptively and excluded from the main results. In a supplementary specification, adding both account-linked variables raised the weighted pseudo R-squared to 0.619. That increase is treated as a mechanical fit artefact rather than substantive explanatory power, so the supplementary coefficients are not reported or used to draw policy conclusions.

Table 3: Survey-Weighted Determinants of Formal Financial Inclusion in Nigeria (Average Marginal Effects)

Variable	B	Se	p
Respondent age	0.004	0.002	0.030
age_sq	-0.000	0.000	0.430
Male	0.087	0.036	0.017
Respondent education level	0.200	0.032	0.000
Within-economy household income quintile=1	0.000	.	.
Within-economy household income quintile=2	0.061	0.059	0.295
Within-economy household income quintile=3	0.151	0.058	0.009
Within-economy household income quintile=4	0.206	0.060	0.001
Within-economy household income quintile=5	0.183	0.061	0.003
Internet	0.264	0.034	0.000
Observations	943		

Notes: Survey-weighted average marginal effects with robust standard errors are reported. The base category for income is the lowest quintile. Mobile-money-account ownership and digital-payment use are excluded from the primary model because of their close relationship with existing account ownership. *** $p < .01$, ** $p < .05$, * $p < .10$.

4.9 Discussion and Link to Existing Literature

Overall, the revised findings show that education, internet access, gender, and income are central correlates of formal financial inclusion in Nigeria. The substantial association with internet use underscores the importance of digital connectivity, while the exclusion of account-linked digital behaviours from the primary model avoids overstating their independent explanatory role. These results are consistent with evidence that digital connectivity can complement traditional socio-economic determinants of financial inclusion (Demirgüç-Kunt et al., 2022; Ozili, 2021). They support policies that expand reliable internet access and digital skills alongside measures that reduce structural gender and income barriers.

5. Conclusion and Policy Implications

5.1 Conclusion

Financial inclusion in Nigeria is jointly determined by human capital and digital connectivity rather than by either factor alone: education and internet access function as complementary levers, and neither is sufficient on its own to close the remaining gaps. Gender and income operate as independent barriers to inclusion that are not resolved simply by expanding digital access, indicating that the structural and social constraints facing women and lower-income households require dedicated policy attention rather than being expected to dissolve as connectivity improves. The absence of a reliable non-linear age effect suggests that the life-cycle framework, while theoretically useful, does not adequately describe how financial participation evolves across the adult population in this context and should be applied cautiously in future specifications.

The decision to exclude mobile-money-account ownership and digital-payment use from the primary model reflects a broader methodological conclusion: measures of digital financial behaviour that are definitionally close to the outcome they are meant to explain should not be treated as independent predictors, since doing so risks manufacturing model fit rather than genuine explanatory power. This has implications for how Global Findex-based inclusion models are specified more generally, beyond the present case. Overall, these conclusions point toward a policy and research agenda built on parallel investment, in connectivity and in education, rather than one that treats digital access as a substitute for addressing income- and gender-based exclusion directly.

5.2 Policy Implications

These findings carry several policy implications for advancing financial inclusion in Nigeria. First, expanding digital infrastructure, particularly internet access, should be prioritised, since improved connectivity lowers transaction costs and broadens participation in formal financial systems, especially in underserved and rural areas. Second, the strong role of education points to financial literacy as a policy priority; integrating basic financial education into schooling and adult education programmes would improve awareness, trust, and effective use of financial services. Third, persistent gender disparities call for gender-sensitive interventions addressing the lower income, limited asset ownership, and social constraints women face, so as to narrow the inclusion gap. Fourth, income-related disparities show that lower-income groups remain constrained in accessing formal financial services; reducing account maintenance costs, simplifying account-opening requirements, and promoting low-cost digital products would extend inclusion to poorer households. Finally, policy should support interoperable, accessible digital-payment ecosystems while recognising that payment use is largely conditional on account ownership. Expanding connectivity and lowering barriers to first-time account ownership should therefore remain central objectives.

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