



AEFUNAI JOURNAL OF ECONOMICS,
FINANCE AND DEVELOPMENT

AEFUNAIJEFDS

Department of Economics and Development Studies
Alex Ekwueme Federal University, Ndufu-Alike Ikwo, Ebonyi State, Nigeria.

Website: <https://www.ecofunai.ng>

ISSN (Print): 2536-6793 | ISSN (Electronic): 2536-6742

Volume 3 (1) February, 2026 (pp 82 - 103)

Submitted October 2025; Published February 2026.

ROLE OF PRODUCTIVE CAPACITIES IN EXPANDING FINANCIAL INCLUSION IN NIGERIA

¹Nwachukwu Ikemefula Ndubuisi, ^{*1}Asogwa Ikechukwu Sebastine, ²Anumudu Charles Nnamdi, &
²Ugwuanyi Charles Uche.

¹Department of Economics, Michael Okpara University of Agriculture,

²Umudike, Abia State, Nigeria,

Email: is.asogwa@mouau.edu.ng

ABSTRACT

This study examines the role of financial inclusion's productive capacities in shaping the level of financial inclusion in Nigeria. Cross-sectional data from the 2017 Global Findex Survey are used to compute a Financial Inclusion Productive Capacity Index (FPCI) following the UNCTAD framework, while Principal Component Analysis reduces multiple indicators into seven core productive capacity dimensions. Logistic regression models estimate their effects on digital access to financial accounts and borrowing from formal financial institutions. The results show that components dominated by digital usage, card-based transactions, remittance flows, agricultural payments, and government transfers significantly increase the odds of financial inclusion, whereas non-matched ownership of financial assets without corresponding usage reduces inclusion outcomes, confirming a persistent access–usage gap. Education, particularly secondary schooling, strongly complements financial inclusion, while income and gender effects remain uneven across models. Overall, the findings indicate that financial inclusion in Nigeria is driven more by productive usage than mere access, supporting policies that strengthen digital infrastructure, promote active account use, integrate financial flows into formal channels, and enhance financial literacy.

Keywords: Financial inclusion; productive capacities; digital finance; access–usage gap; Nigeria.

Citation: Nwachukwu, I. N., Asogwa, I. S., Anumudu, C. N., & Ugwuanyi, C. U. (2026). Role of productive capacities in expanding financial inclusion in Nigeria. AEFUNAI Journal of Economics, Finance and Development Studies, 3(1), 82-103.

1. Introduction

Financial inclusion (FI) has increasingly become central to global development discourse, particularly due to its critical role in advancing several of the Sustainable Development Goals (SDGs) that promote peace, prosperity, and environmental sustainability (Demirgüç-Kunt & Klapper, 2012; Demirgüç-Kunt et al., 2017; World Bank, 2022). However, the extent to which inclusion is achieved may be tied to productive capacities of a country's financial sector (Levine, 1997; Guru & Yadav, 2019; Iheonu et al., 2020).

Before 2012, Nigeria had a large population of vulnerable and low-income individuals who were financially excluded (CBN, 2022). This pattern is evident in the 2017 Findex survey, which reported that 95 out of 168 respondents in the poorest income group, 99 out of 159 in the second poorest group, and even 88 out of 283 respondents in the richest quintile did not own a formal financial account (Kunt et al., 2017; CBN 2022). Aggregate statistics further show that 53 percent of Nigerian adults were financially excluded before the adoption of the National Financial Inclusion Strategy in 2012, access to financial services was extremely low- only 21.6 percent of adults had access to payment services, 24 percent to savings, 2 percent to credit, 1 percent to insurance, and 5 percent to pension products (CBN, 2022).

A regional decomposition reveals significant disparities across the six geopolitical zones. The Northeast and Northwest recorded the highest exclusion rates, 68.3 percent and 68.1 percent, respectively, while the North Central (44.2%), Southeast (31.9%), Southwest (33.1%), and South-South (36.0%) were comparatively less excluded (CBN, 2013; 2022). Previous research consistently finds that high financial exclusion is strongly correlated with poverty, income inequality, unemployment, and limited economic opportunities (Ouechtati 2020; Omar and Inaba 2020; Saha and Qin 2021; Polloni-Silva et al. 2021; Tsouli 2022; World Bank 2022). And, evidence from Nigerian experience confirms this pattern in support: that is, financial exclusion aligns closely with persistent poverty and high unemployment (Kama and Adigun 2013; Ogbeide and Igbinigie 2019; Okoduwa and Odiboh 2019; Eze and Alugbuo 2021; CBN 2022). Amidst a highly excluded population in Nigeria, in 2023, the UN estimated Nigeria's population at 223.5 million, and over 43 percent live below the poverty line. Unemployment reached 23.1 percent of the labor force in 2018, up from 20.4 percent in 2017 (CBN 2013; CBN 2018; World Bank 2022).

The role of the financial productive capacities is currently being questioned. Blame for the inefficiencies now falls on Nigeria's weakened financial productive capacity, and effects are manifested by recurrent financial crises and exposure to global economic shocks (World Bank 2022). Recently, Nigeria's implementation of the currency redesign policy witnessed disrupted access to cash and heightened financial system constraints between 2022 and 2023. Lessons from the key indicators' performance earlier illustrate a declining trend; currency outside the banking sector as a proportion of narrow money (M1) fell from 48.74 percent in 2020 to 14.72 percent in 2021, while credit to the private sector relative to GDP decreased

from 18.82 percent in 2020 to 18.67 percent in 2021 (CBN, 2021). Historically, credit decline has been persistent; the 2006 monetary survey revealed a fall in domestic credit from ₦2,313.39 billion in 2005 to ₦714.21 billion in 2006 (CBN, 2013).

Nigeria's financial policies draw on lessons from empirical evidence existing in contemporary countries. For example, Malaysia's financial inclusion experience underscores the importance of expanding financial infrastructure, broadband access, and regulatory reforms as foundational drivers of inclusive financial systems (World Bank 2017; Ozili 2022). In this light, Nigeria has prioritized financial sector reforms, including banking consolidation and financial market expansion within its national development plans. And introducing transformative policy actions to the 1962–1968 Development Plan, which emphasized financial sector expansion to support agricultural growth (CBN, 2013), the subsequent 1970–1974 and 1975–1980 plans prioritized reconstruction and financial deepening (CBN, 2018). Now, the revised National Financial Inclusion Strategy (2022) is aimed at reducing financial exclusion to 20 percent, enhancing savings mobilization, strengthening banking habits, improving SME credit access, and closing gaps in income inequalities while promoting inclusive development in both rural and urban areas, building on earlier initiatives such as the 1970 rural banking scheme (CBN, 2022).

Despite these efforts, the reality on the ground shows that Nigeria's financial productive capacity has not demonstrated sufficient strength to achieve the goals set by financial inclusion. The latest data further demonstrate that financial exclusion remains widespread and unevenly distributed. For example, in 2022, the North Central zone recorded the highest share of unbanked adults (87%), a sharp increase from 44.4 in 2012. The North East followed with 85 percent excluded, up from 66.4 percent in 2012 (CBN 2013; 2022). Gender disparities are also pronounced: 52 percent of the 21.3 million adult females surveyed in 2022 were financially excluded, compared to 41 percent of males. Only 23 percent of adult females and a limited share of males have access to formal bank accounts (CBN, 2022). Similarly, Nigeria's digital financial inclusion also lags behind developing economies like Brazil, South Africa, Thailand, Malaysia, and Indonesia, thereby raising concern for some research questions (Kama and Adigun, 2013; World Bank, 2022). For instance, the access to financial infrastructure remains weak: Nigeria has only 11 ATMs per 100,000 adults, and 13 POS terminals per 100,000 adults (CBN, 2022).

Research Questions

- a) What is the level of the financial inclusion productive capacities in Nigeria?
- b) What are the effects of financial inclusion on the level of inclusion in Nigeria?

Objectives of the Study

This study is poised to address the research questions using the Findex Survey 2017 with the set objectives:

- a) To construct the financial inclusion productive capacity of Nigeria.
- b) To ascertain the effects of the financial inclusion productive capacities on the level of household inclusion in Nigeria.

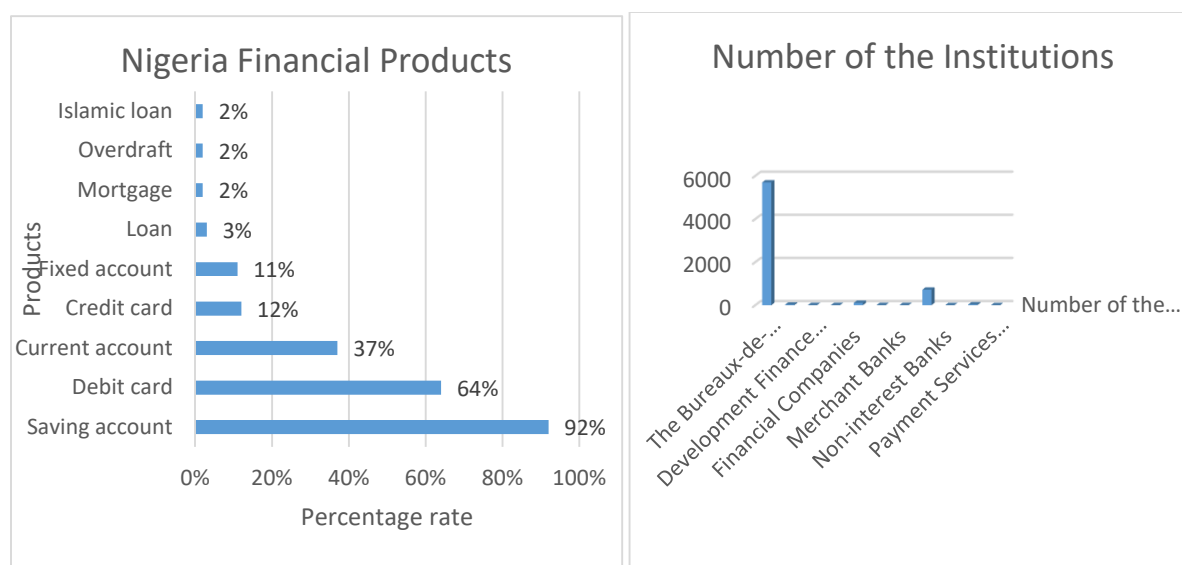
2. Literature

2.1 Conceptual Literature

In Nigeria, financial inclusion is viewed as a vital tool for promoting broad-based economic growth, reducing poverty, enhancing gender equity, expanding access to finance, improving employment outcomes, and strengthening the performance of small and medium enterprises (SMEs) (Kose & Wei, 2010; Casanova & Dutta, 2018; CBN, 2022). The productive capacities of the financial system are derived from institutional and market-based indicators such as account ownership, transaction costs, credit allocation, capital adequacy, liquidity ratios, domestic credit to the private sector, and financial market stability (Svirydzhenka, 2016; Indexmundi, 2019). Whether the presence of these indicators translates into sustainable financial inclusion remains debated. The World Bank (2018; 2022) defines financial inclusion as the provision of affordable, accessible, and appropriate financial products and services such as payments, savings, credit, insurance, and remittances delivered sustainably and responsibly. The foundational mechanism for delivering these services is closely tied to financial productive capacities, while UNCTAD (2020) emphasizes that multidimensional financial productivity indices provide diagnostic insights into a financial sector's readiness to support inclusive development.

Nigeria committed to advancing financial inclusion in 2010 by joining 54 countries to develop a national strategy addressing financial access barriers (World Bank, 2018). The National Financial Inclusion Strategy (NFIS), launched in 2012, aimed to reduce financially excluded adults to 20 percent by 2020. Baseline data showed that 53 percent of adults were excluded by 2008, and by 2010, only 21.6 percent accessed payment services, 24 percent savings, 2 percent credit, 1 percent insurance, and 5 percent pensions (CBN, 2020).

As initiatives expanded, reliance on savings, credit, digital payments, and insurance increased (CBN, 2013; World Bank Findex, 2018). Financial inclusion is now widely recognised as a core component of economic empowerment (Kama & Adigun, 2013; CBN, 2022; World Bank, 2022). However, Nigeria's financial system still exhibits structural weaknesses and gender disparities, with only 30 percent accessing formal banks and female exclusion (52 percent) exceeding male exclusion (41 percent) (CBN, 2022), reflecting limitations in financial productive capacities.



Source: CBN (2022).

Figure 1: Nigerian Financial Products, and the Financial Institutions.

Table I: Financial exclusion and access distribution by Gendered population

Status	Formally Banked	Other formal Access	Informal Access	Financial exclusion
Population rate	30.0%	6.3%	17.4%	46.3%
Female gender	23%	6%	19%	52%
Male	37%	6%	16%	41%

Source: CBN 2020. www.cenbank.org

2.2 Empirical Literature Review

In Nigeria, financial inclusion is viewed as a vital tool for promoting broad-based economic growth, reducing poverty, enhancing gender equity, expanding access to finance, improving employment outcomes, and strengthening the performance of small and medium enterprises (SMEs) (Kose & Wei, 2010; Casanova & Dutta, 2018; CBN, 2022). The productive capacities of the financial system are derived from institutional and market-based indicators such as account ownership, transaction costs, credit allocation, capital adequacy, liquidity ratios, domestic credit to the private sector, and financial market stability (Svirydzenka, 2016; Indexmundi, 2019). Whether the presence of these indicators translates into sustainable financial inclusion remains debated. The World Bank (2018; 2022) defines financial inclusion as the provision of affordable, accessible, and appropriate financial products and services, such as payments, savings, credit, insurance, and remittances, delivered sustainably and responsibly. UNCTAD (2020) further notes that multidimensional financial productivity indices provide essential diagnostic insights into financial sector readiness for inclusive development.

Nigeria committed to advancing financial inclusion in 2010 by joining 54 countries to develop a national strategy addressing barriers to financial access (World Bank, 2018). The National Financial Inclusion Strategy (NFIS), launched in 2012, targeted a reduction in financially excluded adults to 20 percent by 2020. Baseline data show that 53 percent of adults were excluded in 2008, while access to payments, savings, credit, insurance, and pensions remained limited by 2010 (CBN, 2020).

In Nigeria, financial inclusion is viewed as a vital tool for promoting broad-based economic growth, reducing poverty, enhancing gender equity, expanding access to finance, improving employment outcomes, and strengthening the performance of small and medium enterprises (SMEs) (Kose & Wei, 2010; Casanova & Dutta, 2018; CBN, 2022). The productive capacities of the financial system are derived from institutional and market-based indicators such as account ownership, transaction costs, credit allocation, capital adequacy, liquidity ratios, domestic credit to the private sector, and financial market stability (Sviryzdenka, 2016; Indexmundi, 2019). Whether the presence of these indicators translates into sustainable financial inclusion remains debated. The World Bank (2018; 2022) defines financial inclusion as the provision of affordable, accessible, and appropriate financial products and services, payments, savings, credit, insurance, and remittances, delivered sustainably and responsibly. UNCTAD (2020) further emphasizes that multidimensional financial productivity indices provide essential diagnostic insights into financial sector readiness for inclusive development.

Empirical evidence suggests the establishment of financial inclusion and the productive capacity of financial systems linkage, especially with enhanced intermediation, credit allocation, and institutional efficiency. Dai-Won, Jung-Suk, and Hassan (2018) examine the relationship between financial inclusion and economic growth across 55 Organization of Islamic Cooperation (OIC) countries using dynamic panel estimation, panel vector autoregression (VAR), impulse response functions (IRFs), and panel Granger causality tests. Results from the study show that financial inclusion has a statistically significant and positive effect on economic growth. Moreover, the IRFs reveal that shocks to financial inclusion generate sustained positive responses in economic growth, and the Granger causality tests confirm a bidirectional relationship between financial inclusion and growth. These findings underscore the role of financial inclusion as a mechanism through which financial systems enhance productive capacity by mobilizing savings, improving access to credit, and supporting investment. For Nigeria, an OIC member, this evidence implies that strengthening financial inclusion can reinforce the productive capacity of the financial sector and stimulate sustainable growth.

Financial inclusion also alleviates constraints related to access, penetration, and usage of formal financial services, which are critical components of financial productive capacity. In a seminal study, Levine, Loayza, and Beck (2000) investigate whether the exogenous components of financial intermediary

development influence long-run economic growth. Using generalized method of moments (GMM) dynamic panel estimators and cross-sectional instrumental variable techniques for 71 countries, they employ indicators such as the size of banking institutions, the dominance of commercial banks relative to central banks, and the extent of private sector credit allocation. Their findings reveal a robust and positive relationship between financial intermediary development and long-term economic growth, with private credit, bank-based intermediation, and liquidity measures emerging as significant drivers of growth. These results highlight the importance of financial institutions' capacity to channel resources efficiently to productive private sector activities.

In the Nigerian context, the implications of Levine et al. (2000) are particularly relevant, as limited credit to the private sector, weak interface efficiency, and shallow financial depth continue to constrain financial inclusion. The evidence suggests that improving the productive capacity of financial institutions through deeper credit markets, stronger banking intermediation, and expanded access channels can enhance financial inclusion outcomes. Consequently, financial inclusion and productive capacity should be viewed as two sides of a coin that mutually reinforce processes. That is, where improvements in financial system capacity strengthen inclusion, and expanded inclusion further deepens the productive role of finance in Nigeria. Overall, the empirical literature demonstrates that financial inclusion is not merely a social or distributional objective, but a critical dimension of financial productive capacity. However, while global evidence is compelling, Nigeria-specific empirical studies explicitly linking productive capacities to financial inclusion remain limited, reinforcing the need for country-focused analysis that integrates financial productive capacity indicators into the financial inclusion discourse.

Other strands of literature focused on the nexuses between the digital economy, financial inclusion, and financial productive capacities in Nigeria. Babajide, Adegboye, and Omankhanlen (2015) provide early empirical evidence linking financial inclusion to productivity outcomes. Using World Bank development indicators and ordinary least squares estimation, the study finds that financial inclusion significantly influences total factor productivity and capital per worker, both of which are core elements of financial productive capacity. Their findings suggest that inclusive access to financial services strengthens the economy's productive base by improving capital accumulation and resource utilization, reinforcing the argument that financial inclusion operates beyond welfare effects to support structural transformation. Zins and Weill (2016), using Global Findex data for 37 African countries, show that Africa lags behind global averages in formal account ownership, savings, and access to credit. With a probit model, they identify education, income level, age, and gender as significant determinants of financial inclusion. And, the study highlights the role of ICT access as a facilitator of inclusion, a finding that aligns with Bansal (2014), who demonstrates that ICT penetration and digital literacy significantly enhance financial inclusion in India.

These studies imply that the digital economy is a crucial driver of financial productive capacity by lowering access barriers and expanding financial system reach. Migap, Okwanya, and Ojeka (2015) compare Nigeria's financial inclusion indicators with those of emerging economies and find them to be relatively shallow. They argue that limited financial literacy and weak information dissemination constrain inclusion outcomes, thereby weakening the productive capacity of the financial sector. In contrast, Nkwede (2015) reports a negative relationship between financial inclusion and economic growth in Nigeria over the period 1981–2013, attributing this outcome to persistent financial exclusion, especially among rural and low-income populations. This finding suggests that when inclusion is narrow or uneven, financial productive capacities remain underdeveloped and unable to support growth effectively.

The transformation is traced to a micro-level and sector-specific to further demonstrate these dynamics. Onaolapo and Odetayo (2012) show that access to microfinance services in Nigeria promotes employment generation, poverty reduction, and growth, underscoring the role of specialized financial institutions in extending productive financial services to underserved groups. Similarly, Onaolapo (2015) finds that bank branch expansion, rural lending, and credit to small-scale enterprises significantly support poverty reduction and financial intermediation, although their impact on aggregate growth remains modest. These findings highlight that financial inclusion enhances productive capacity most strongly when credit is channeled to productive sectors such as agriculture and SMEs (Onaolapo and Odetayo 2012; Onaolapo 2015; Gutu, Máté, and Hágen, 2025; Mahi and Zainuddin 2025). Furthermore, Nwafor and Aremu (2018), using a two-stage least squares approach, find that financial inclusion significantly promotes economic growth, although financial intermediation has not sufficiently driven inclusion. Enueshike and Okpebru (2020) further show that loans to SMEs and rural bank deposits significantly enhance growth, suggesting that productive credit allocation is central to strengthening financial productive capacities. However, Okoye et al. (2016) find that private sector credit has not significantly supported growth, even though rural credit delivery contributes to poverty alleviation. This divergence indicates that the effectiveness of financial inclusion depends on the structure, efficiency, and digital readiness of the financial system.

African perspective reinforces the digital financial inclusion productivity nexus. Studies on Kenya (Aduda & Kulanda, 2012; Allen et al., 2013) and Malawi (Brune et al., 2011) demonstrate that expanded access to banking services and savings instruments improves household productivity, agricultural investment, and welfare. Randomized experiments in Niger by Aker et al. (2011) further show that mobile money transfers reduce transaction costs, diversify expenditures, and strengthen productive activities, particularly among women. These findings are directly relevant to Nigeria, where digital financial services have expanded rapidly but remain unevenly distributed. Studies emphasizing the digital economy dimension further

reinforce this argument. Andrianaivo and Kpodar (2011) demonstrate that ICT, particularly mobile phone penetration, significantly enhances economic growth in Africa by facilitating financial access. Nguling'wa (2019) similarly finds that financial inclusion promotes growth in Sub-Saharan Africa, especially when supported by savings mobilization and financial technology. These results imply that digital finance strengthens financial productive capacity by improving scale, efficiency, and inclusiveness of financial intermediation.

3. Methodology

Principal Component Analysis (PCA)

The multiplicity of possible correlations among the variables of financial inclusion indicators applies PCA for data reduction in large interrelated variables while retaining as much as possible of the variation present in the data set (Jolliffe, 2002). The various approaches to PCA include the eigenvalues approach, the eigenvector approach, and the correlation approach. The first approach to the application of PCA is the definition of a linear function $\alpha_1^I x$ of the elements of X having maximum variance, where A vector of P is constant $\alpha_{11}, \alpha_{12}, \dots, \alpha_{1p}$ and denotes transpose, so that:

$$\alpha_1^I x = \alpha_{11}x_1 + \alpha_{12}x_2 + \dots + \alpha_{1p}x_p = \sum_{j=1}^n \alpha_{1j}x_j, \dots, (1)$$

Secondly, we search for a linear function $\alpha_2^I X$ uncorrelated with $\alpha_1^I X$ having maximum variance and so on, so that at the kth stage, a linear function $\alpha_k^I X$ is found that has maximum variance subject to being uncorrelated with $\alpha_1 X_1, \alpha_2 X_2 \dots \alpha_k^k X$. . Therefore, the kth derived variable $\alpha_k^I X$ is the kth principal component, PC.

Model Specification

The method of Principal Component Analysis is applied in line with the UNCTAD (2021) framework to the Keynesian demand for money function to compute the financial inclusion productive capacities indices in Nigeria, following the fixed effect model. Therefore, to compute the financial inclusion productive capacity indices, the study methodological specification is provided below.

$$Z = AX, \dots, (2)$$

Where Z represents the PCs, A represents the column vector of the eigenvector of the correlation matrix, and X_i represents the vectors of the variables as in equation (2). X_i includes all the financial inclusion

instruments capable of determining the financial inclusion objectives, as explained by the Keynes demand for money function in the equation. Hence

Financial Inclusion = F(literacy rate, population, inflation, interest rate, Account ownership, age, financial institution Account, use of financial facilities for the payment of bills, saving habit, credit access, debit card ownership, remittance, smartphone accessibility, credit card mobile money accounts).

The UNCTAD (2021) methodology for productive capacity index computation computes the financial Inclusion productive capacity indices (FPCI) using the specified equation 3:

$$FPCI = \sqrt[N]{\prod_{i=1}^N X_i^{PCA}}, \quad (3)$$

Where $X_{i=1}^{PCA}$ represent the FPCI category scores extracted using the Principal Component Analysis (PCA) on the financial inclusion instruments and determinants.

The Logistic Regression Model

Thereafter, with PCA, the Logistic Regression Model is applied to the Keynesian demand for money to enable the estimation of the effects of the financial inclusion productive capacities on the financial inclusion. To this end, the functional specification of the model is

$$FI = F(FPCI) \quad (4)$$

And, the FI is measured with the financial inclusion indicators obtained from the Findex 2017 data, following Nguyen's (2021) framework and indices computed with PCA.

The Logistic Regression Model is rationalized in an econometric model when the dependent variables (outcome) are binary in nature, that is, (1/0), (yes/no), (poor/ not poor), (Access /no Access). The probability that an outcome variable happens, say $Y = 1$, given a set of explanatory variables, is estimated using equation 5

For all binary outcomes $Y \in \{0,1\}$:

$$P(Y=1/X) = \frac{\ell^{\beta_0 + \beta_1 X_1 + \dots + \beta_k X_k}}{1 + \ell^{\beta_0 + \beta_1 X_1 + \dots + \beta_k X_k}} \quad (5)$$

And the odds ratio is estimated using the logit approach, and specified in equation 6:

$$\text{Logit}(P) = \ln\left(\frac{P}{1-P}\right) = F(FPCI, Z_i) \quad (6)$$

Where $\ln\left(\frac{P}{1-P}\right)$ denote the log odds and β_k is the effect of the predictor X_k on the log-odds.

Variable Description

The study would utilize a cross-sectional survey on financial inclusion (Findex) conducted by the World Bank in 2017 and extracted from the Global Findex Database. The survey measures financial inclusion and the fintech revolution, sourced from the World Bank's 2019 data in Nigeria. The variables are explained in the group following the themes. The Financial Inclusion Productive Capacity Indices computation is derived from the financial productive resources. Within the context of this study, the financial productive resources include interest rate regime, financial institution Account, Number of ATMs, POS, saving account, Credit access, Debit card ownership, credit card issuance, Bank capital to assets ratio, Bank liquid reserve to bank assets ratio, Bank nonperforming loans to total gross loan, Claim on central government, Domestic credit to the private sector, net domestic credit.

FII includes the index computation with the financial inclusion instruments that comprise account ownership, financial institution accounts, use of financial facilities for the payment of bills (ATM, POS, and Credit cards), savings accounts, Credit Access, and Debit card ownership.

The control variable includes all the variables that may not directly explain financial inclusion or financial productive resources, but can indirectly determine the behavior of the variables. The control variables include literacy rate, age, population, sex, region (urban or rural), income group, and remittance. Small and Medium Businesses SMES: The small and medium enterprises are classified by gender in Nigeria.

4. Results and Discussion

4.1 Results

Estimation of Financial Inclusion Productive Capacities

The estimate from the Principal Components/Correlation results showed that 19 variables were included in the model. That is, the 19 components from the PCA corresponding with the eigenvalues greater than 1, the proportion of variance explained, and the cumulative variance. Following the Kaiser criterion, only components with eigenvalues greater than one (eigenvalue > 1) are retained as meaningful contributors to the underlying structure of the data. Based on this rule, the PCA retained seven (7) components—from Comp1 to Comp7—since only these have eigenvalues above one. Components 8 through 19 have eigenvalues below one and are therefore not considered significant.

Figure 2 graphically confirms this, showing the seven retained components with eigenvalues exceeding one and lying above the zero line.

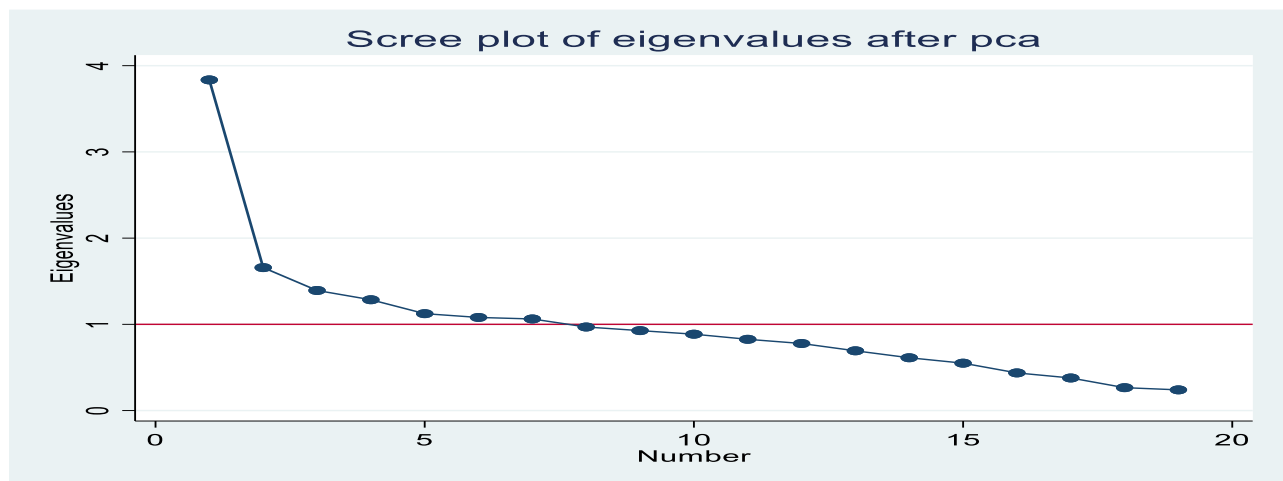
Number of obs = 1,000
Number of comp. = 7
Trace = 19
Rho = 0.6020

Table 2: Principal components/correlation

Component	Eigenvalue	Difference	Proportion	Cumulative
Comp1	3.835	2.177	0.202	0.202
Comp2	1.658	0.265	0.087	0.289
Comp3	1.393	0.108	0.073	0.362
Comp4	1.285	0.161	0.068	0.430
Comp5	1.124	0.044	0.059	0.489
Comp6	1.080	0.018	0.057	0.546
Comp7	1.062	0.093	0.056	0.602
Comp8	0.969	0.042	0.051	0.653
Comp9	0.927	0.042	0.049	0.702
Comp10	0.886	0.059	0.047	0.748
Comp11	0.826	0.049	0.043	0.792
Comp12	0.778	0.085	0.041	0.833
Comp13	0.693	0.081	0.036	0.869
Comp14	0.613	0.063	0.032	0.902
Comp15	0.550	0.113	0.029	0.930
Comp16	0.437	0.059	0.023	0.954
Comp17	0.378	0.112	0.020	0.973
Comp18	0.266	0.026	0.014	0.987
Comp19	0.240	.	0.013	1.000

Computed by the author

Figure 2: Scree Plot of eigenvalues after PCA



Computed by the author

Component Loadings

The purpose of examining these loadings is to identify clusters of variables with high absolute values, which reflect meaningful associations with each component. The decision rule applied here classifies loadings as follows: values ≥ 0.30 indicate a meaningful contribution, values ≥ 0.40 indicate a strong contribution, and

values ≥ 0.50 indicate a very strong contribution. The result of the component loading is presented in Table 3 and plotted in Figure 3.

Table 3: Principal components (eigenvectors) (blanks are $\text{abs}(\text{loading}) < .3$) Blank < 0.3

Variable	Comp1	Comp2	Comp3	Comp4	Comp5	Comp6	Comp7	Unexplained
fin4	0.342							0.424
fin5	0.364							0.296
fin8					-0.374	0.391		0.596
fin9				-0.483	0.461			0.299
fin14a								0.542
fin17a		-0.307						0.481
fin22a					0.313	-0.504		0.444
fin26		-0.451	0.366					0.182
fin27a		0.427	-0.525					0.158
fin29b	0.302							0.587
fin34a					-0.450		-0.338	0.563
fin34b								0.415
fin39b						-0.352		0.488
fin39c2					0.380	0.554	-0.375	0.288
fin43a			0.362	0.387				0.353
fin43c2							0.697	0.418
mobileowner							0.347	0.568
account_fin	-0.322	0.338		-0.307				0.188
account_mob	-0.386							0.272

Computed by the author: Component Score

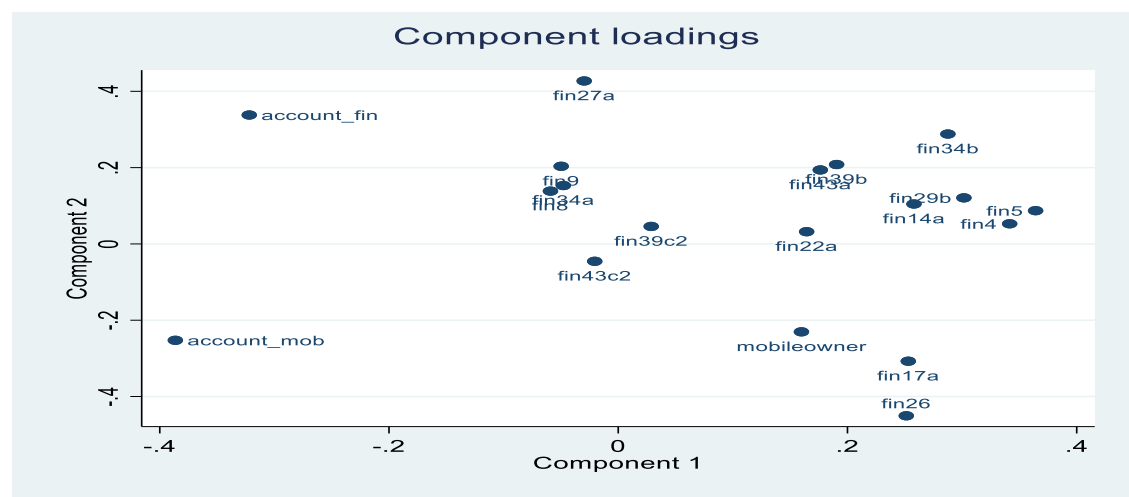


Figure 3 : Component Loadings

The financial inclusion productive capacity index, with the graphical representation in Figure 4, shows that the inclusion strategy is still underperforming, moving from a negative index to a positive index recently. And, contributing to the increase in the index score, the financial instrument usage (“if respondents have a debit card and used in past 12 months-(fin4)”) and “used mobile phone or internet to access FI account-(fin5)”, dominates in impact while the financial access gap is shown by negative response from the access indicators.

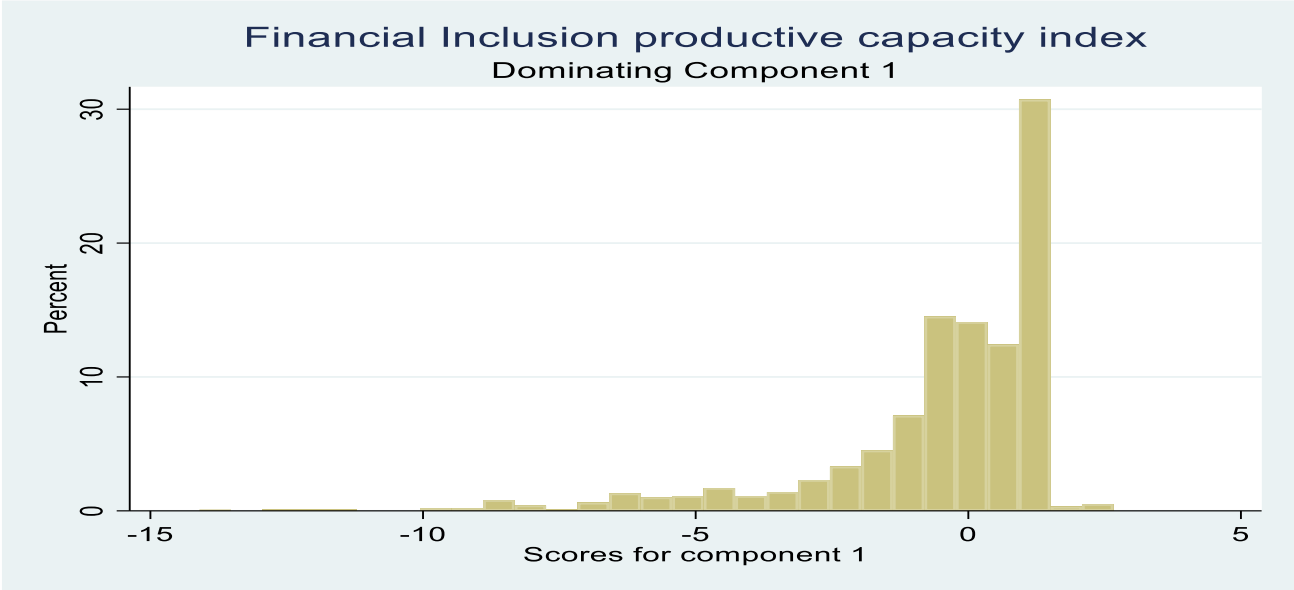


Figure 4: Financial Inclusion Productive Capacity Index

Estimation of the Effects of Financial Productive Capacities on Financial Inclusion in Nigeria

Financial inclusion in this study is classified into two dimensions: financial inclusion access and financial service usage. Each dimension is defined by a set of indicators used in the model. Financial inclusion access primarily captures the ownership or availability of financial instruments such as bank accounts, mobile money accounts, and mobile phones, while financial service usage reflects the actual use of these instruments.

Table 4a presents the estimated effects of financial inclusion on productive capacities on these two dimensions. Consistent with the standard interpretation of odds ratios, a coefficient greater than 1 indicates a positive association, whereas a coefficient less than 1 indicates a negative relationship. The financial inclusion productive capacity indices (findex1 to findex7) are predicted principal component scores derived from the seven retained PCA components with eigenvalues greater than 1. These effects are estimated while controlling for respondents’ socioeconomic characteristics.

Table 4a. Survey: Logistic regression-Used mobile phone or internet to access FI account (fin5)

fin5	Odds ratio	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
age	1.011	.02	0.53	.598	.972	1.05	
Respondent is female		.	.	.	.	.	
Female	1.214	.724	0.33	.745	.377	3.912	
Respondent educational level		.	.	.	.	.	
secondary	49.456	79.058	2.44	.015	2.147	1139.176	**
completed	17.382	26.254	1.89	.059	.897	336.815	*
tertiary level		.	.	.	.	.	
40		.	.	.	.	.	
Within-economy household		.	.	.	.	.	
Second 20%	.159	.193	-1.52	.129	.015	1.712	
Middle 20%	.143	.17	-1.64	.102	.014	1.469	
Fourth 20%	.423	.408	-0.89	.372	.064	2.805	
Richest 20%	.742	.587	-0.38	.706	.157	3.502	
Respondent is in the workforce		.	.	.	.	.	
finindex1	.869	.654	-0.19	.852	.199	3.801	
finindex2	.207	.036	-9.03	0	.147	.291	***
finindex3	.746	.214	-1.02	.306	.425	1.309	
finindex4	3.147	.725	4.98	0	2.003	4.946	***
finindex5	2.813	.764	3.81	0	1.651	4.793	***
finindex6	.53	.151	-2.23	.026	.303	.927	**
finindex7	.572	.174	-1.84	.066	.315	1.037	*
finindex7	7.42	4.057	3.67	0	2.537	21.697	***
Constant	0	0	-4.84	0	0	.003	***
Mean dependent var		0.116	SD dependent var			0.320	
Number of obs		978	F-test			11.754	

*Computed by the author**** $p < .01$, ** $p < .05$, * $p < .1$

Second, the effect of the financial inclusion productive capacity index on financial inclusion will be further evaluated using the odds ratio of “Borrowed in past 12 months: from a financial institution”. The result of the estimated impact of the financial inclusion productive capacity index is presented in Table 4b.

Table 4b Survey: Logistic regression Borrowed in past 12 months: from a financial institution

fin22a	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
age	.992	.023	-0.33	.74	.947	1.039	
Respondent is female		.	.	.	.	.	
Female	1.16	.601	0.29	.775	.419	3.209	
Respondent educational level		.	.	.	.	.	
secondary	2.666	1.855	1.41	.159	.681	10.444	
completed	.859	1.848	-0.07	.944	.013	58.481	
tertiary level		.	.	.	.	.	
40		.	.	.	.	.	
Within-economy household		.	.	.	.	.	
Second 20%	1.71	1.266	0.72	.469	.4	7.313	

Middle 20%	1.482	.929	0.63	.53	.433	5.069	
Fourth 20%	1.321	.694	0.53	.596	.471	3.704	
Richest 20%	.191	.297	-1.07	.286	.009	4.005	
Respondent is in t~:		.	.	.	.	.	
in workforce	6.575	6.211	1.99	.047	1.03	41.982	**
fiindex1	.633	.083	-3.51	0	.49	.817	***
fiindex2	.627	.232	-1.26	.208	.303	1.297	
fiindex3	.579	.205	-1.55	.122	.289	1.159	
fiindex4	.4	.102	-3.61	0	.243	.658	***
fiindex5	.805	.456	-0.38	.702	.265	2.447	
fiindex6	6.858	2.523	5.23	0	3.331	14.117	***
fiindex7	2.38	2.589	0.80	.425	.282	20.119	
Constant		.001	-4.16	0	0	.017	***
Mean dependent var		0.052	SD dependent var			0.223	
Number of obs		972	F-test			9.539	

*Computed by the author *** $p < .01$, ** $p < .05$, * $p < .1$*

4.2 Discussion of Results

Financial Inclusion Productive Capacities

From Table 2, the first component (Comp1) has an eigenvalue of 3.835, accounting for 20.2% of the total variance. The drop in variance explained between Comp1 (20.2%) and Comp2 (8.7%) is considerable, indicating a strong dominance of the first underlying dimension in explaining variation in the dataset. The proportions of variance explained continue to decline gradually from Comp2 to Comp7, but together these seven components account for 60.2% of the cumulative variance. This suggests that the first seven principal components capture a substantial portion of the variability across the 19 variables, consistent with expectations for survey-based datasets where variables tend to exhibit moderate, but not perfect, correlations.

Additionally, the eigenvalues show a steep decline between Comp1 and Comp2 (a difference of 2.177). From Comp3 onwards, the decline is more gradual and stable until Comp7. Beyond Comp7, the eigenvalues fall below one, with each remaining component explaining less than 6% of the total variation. These components are likely to contribute more noise than meaningful structure.

Overall, the eigenvalue pattern indicates that the PCA reveals one dominant dimension (Comp1) and several smaller but still meaningful secondary dimensions (Comp2–Comp7), while the remaining components mainly represent minor variations or noise within the data.

Component Loadings > 0.3

Component 1 captures traditional financial inclusion activities that reflect productive financial capacity. Variables with positive loadings include fin4 (0.34), fin5 (0.36), and fin29b (0.30). These represent, respectively, the use of debit cards, the use of mobile phones or the internet to access financial accounts,

and the receipt of domestic remittances through mobile phones. Positive loadings indicate that increases in these behaviors raise the score of Component 1, implying strong alignment with financial inclusion.

For Component 2, fin27a (0.4271) sending domestic remittances through a financial institution and account_fin (0.3379) load positively, suggesting that active use of the formal financial system contributes to higher scores on this dimension. Conversely, fin17a (-0.3074) (borrowing from a financial institution) and fin26 (-0.4505) (sending domestic remittances overall) load negatively.

Component 3 has positive loadings for fin43a (0.3622), receipt of agricultural payments into an account, and fin26 (0.3659), both of which signify functional financial system usage. Conversely, fin27a (-0.5254) loads negatively, implying that remittances sent through financial institutions contribute less to this component. The contrast suggests that while digital and agricultural payment-based financial participation enhances productive capacity, remittance channels behave differently within this component.

Component 4 is defined by a strong positive loading for fin43a (0.3871), receipt of agricultural payments into an account. This reinforces the importance of formal financial inflows in strengthening productive financial capacity. Negative loadings for fin9 (-0.4828), absence of deposits in the past 12 months, and account_fin (-0.3071) indicate that lack of account activity and lack of account ownership reduce this component's score. These results align with existing literature emphasising the combined importance.

Variables with positive loadings include fin9 (0.4605), fin22a (0.3134), borrowing from a financial institution, and fin39c2 (0.3803), receipt of government transfers to a card. These patterns imply that active formal financial usage strongly contributes to this component. Conversely, fin8 (-0.3736) credit card usage and fin34b (-0.3376) receipt of wage payments into an account load negatively. This indicates that infrequent credit card use or the absence of account-based wage payments diminishes the component score.

Positive loadings for fin8 (0.3909) and fin39c2 (0.5541) suggest that credit card usage and receipt of government transfers to a card contribute strongly to this dimension. Negative loadings for fin22a (-0.5037) and fin39b (-0.3376) indicate that lack of borrowing from financial institutions and non-use of mobile platforms for government transfers reduce the component score. Overall, Component 6 differentiates between formal card-based financial flows and alternative, less formalized usage patterns.

Component 7 is strongly defined by fin43c2 (0.6966) receipt of agricultural payments to a card—and mobile owner (0.3467). This highlights the importance of mobile and card-based financial infrastructure. Negative loadings for fin34a (-0.3376) and fin39c2 (-0.3746) show that the lack of wage payment into accounts and the lack of government transfer receipts to a card reduce the component score.

Collectively, the seven retained components reflect multidimensional aspects of financial inclusion productive capacity in Nigeria. Positive loadings consistently highlight the significance of digital channels,

card-based transactions, and formal financial inflows, whereas negative loadings frequently indicate inactivity, informal remittance practices, or underuse of financial accounts. These findings reinforce the literature's emphasis on usage rather than mere access as the core determinant of meaningful financial inclusion.

Effects of Financial Productive Capacities on Financial Inclusion in Nigeria

From Table 4a, *findex1* is largely driven by strong loadings on *fin4*, *fin5*, and *fin29b*, and *account_fin* significantly reduces the odds of financial inclusion. Specifically, an increase in *findex1* decreases the likelihood of using a mobile phone or the internet to access a financial account by 79%. This outcome reflects a financial access usage gap, whereby individuals possess financial assets (such as accounts) but do not actively use them. This phenomenon is well established in the literature, which shows that account ownership alone does not guarantee digital or transactional engagement, especially in countries like Nigeria (World Bank 2021; Agarwal et al., 2023; Demirgüç-Kunt et al., 2018).

In contrast, *findex3*, shaped mainly by *fin26*, *fin27a*, and *fin43a* (remittance activities and agricultural payments), significantly increases the likelihood of using mobile or internet channels for financial transactions. This suggests that engagement in structured financial flows enhances service usage, supporting the argument that financial activity, rather than mere ownership, drives financial inclusion.

Similarly, *findex4* and *findex7* positively influence the use of mobile phones or the internet to access financial accounts. The variables dominating these components reflect matched financial ownership and usage, such as deposits into accounts, agricultural payments, wage payments, government transfers, and mobile phone ownership. These findings support evidence that combined access and usage components form the foundation of effective and productive financial inclusion. On the other hand, *findex5* and *findex6* reduce the odds of digital financial access. Component loadings show that these indices are driven largely by negatively aligned financial behaviours, such as non-use of credit cards (*fin8*), absence of wage payments into accounts (*fin34a*), and inconsistent use of formal borrowing channels (*fin22a*). These patterns weaken the effectiveness of financial inclusion initiatives, thereby lowering digital engagement. Beyond the productive capacity indices, education, particularly secondary schooling, significantly increases the likelihood of financial inclusion. This underscores the importance of basic financial literacy and foundational education in enhancing individuals' ability to access and use financial services.

Secondly, from Table 4b, *findex1* and *findex4* showed a negative impact on the odds ratio of borrowing in the past 12 months from a financial institution. For the composition of the *findex 1* and *findex4*, the component loading shows that *findex1* is largely dominated by non-matched ownership of financial assets, with financial service usage leading to a financial inclusion access gap. This finding is consistent with the use of mobile phones to access financial accounts and is supported by a plethora of studies to establish that

account ownership alone does not predict digital usage (World Bank 2021; Agarwal et al.2023; Demircuc-Kunt et al., 2018). Unlike with the use of a mobile phone to access a financial account, the findex 6 showed increasing impact on the odds ratio of “Borrowed in the past 12 months: from a financial institution”. Also, the component loading for findex6 comprises fin8, fin39b, and fin39c2, which imply a combination of the financial asset ownership and financial service usage.

5. Conclusion and Recommendation

5.1 Conclusion

From the study, financial inclusion in Nigeria is primarily informed by the productive capacities of the financial system, rather than by access alone. With the Principal Component Analysis and logistic regression using the Global Findex data, the study shows that multidimensional financial productive capacity indices pose dimensional effects on financial inclusion outcomes. That is, some components significantly enhance digital financial usage and formal borrowing, while others reduce inclusion due to persistent non-matching between ownership and usage of financial services.

The findings reveal that financial inclusion improves when access to financial instruments is matched with a corresponding and active engagement through digital platforms, remittances, agricultural payments, wage transfers, and government disbursements. In contrast, just a possession of accounts without meaningful transaction activity weakens inclusion outcomes. This access-to-usage gap explains why Nigeria continues to record high financial exclusion despite years of policy reforms.

Also, the study underscores the role of education and digital infrastructure in transforming financial access into productive inclusion. It also highlights the need for measuring Nigeria’s financial inclusion strategy toward usage-driven, digitally enabled, and regionally inclusive policies.

Generally, the study contributes to the literature by introducing a financial inclusion productive capacity framework for Nigeria. Likewise, empirical demonstration of financial inclusion is effective only when financial systems are capable of translating access into sustained economic participation. Strengthening these productive capacities is therefore underscored for achieving inclusive growth, poverty reduction, and sustainable development in Nigeria.

5.2 Recommendation

Empirically, the result from the study showed that financial inclusion in Nigeria is not primarily challenged by limited access but by the weak financial inclusion productive capacities, namely, ownership of financial instruments and effective usage. The policy implications based on the findings are listed below:

First, the findings propose a policy to drive effective financial inclusion from Account Ownership to Active Usage. That is, Nigeria's financial inclusion strategy should go beyond the indicators of just access or ownership of accounts to prioritize steady and productive usage of financial services. This is supported by the negative effects of some financial productive indices (like *findex 1* and *findex 4*) on digital access and borrowing outcomes, and revealing a persistent access gap. To measure efficiency in usage, policies targeted at accounting for the usage-based performance metrics like frequency of transactions, digital payments, and formal borrowing should be integrated into the National Financial Inclusion Strategy framework.

Second, evidence from the study supports a strengthened digital financial infrastructure that will be affordable. The strong positive influence of components dominated by mobile phone usage, card payment, and digital remittance (*findex3*, *findex4*, and *findex7*) rationalized the digital channels to productive financial inclusion. Therefore, the government and financial regulator can achieve this by expanding broadband and mobile network coverage, reducing transaction cost and incentivizing the acceptance of fintech.

Third, with agricultural payment, wage payments, government transfers, and remittances carried out through formal financial channels significantly enhancing financial inclusion outcomes, the integration of the financial flows into formal channels is proposed. For example, financial regulators can scale up digital payment platforms for the agriculture value chain, compel account-based disbursement of government social transfers, and promote remittance digitization through regulated financial institutions and mobile platforms.

Fourth, access to credit should be expanded through the formal institutions. That is, the positive and significant effect of *findex6* on borrowing from financial institutions highlights the essence of a corresponding financial access with usage in the credit market. Nigeria can address the continuous constraints to credit by designing a collateral loan product that is affordable to SMEs, farmers, and informal workers hosted by a financial institution.

Five, financial literacy and education are advised to be mainstreamed. Secondary education showed a significant determinant of financial inclusion. Hence, a formal integration of financial literacy should be mainstreamed into the curricula. And or, community design digital and financial literacy intervention considering women is further suggested to complement formal education.

References

- Aduda, J., & Kalunda, E. (2012). Financial inclusion and financial sector stability with reference to Kenya: A review of literature. *Journal of Applied Finance and Banking*, 2(6), 95–120.
- Agarwal, S., Alok, S., Ghosh, P., Ghosh, S., Piskorski, T., & Seru, A. (2023). Banking the unbanked: What do 280 million new bank accounts reveal about financial access? *Columbia Business School Research Paper No. 17-12*. <https://doi.org/10.2139/ssrn.2906523>
- Ajakaiye, O., & Olowookere, A. (2013). Financial inclusion in Nigeria. *Newswatch Times*.
- Aker, J. C., Boumnijel, R., McClelland, A., & Tierney, N. (2011). Zap it to me: The short-term impacts of a mobile cash transfer program (Working Paper No. 268). *Center for Global Development*.
- Allen, F., Carletti, R., Cull, R., Qian, J., & Valenzuela, P. (2013). Resolving the African financial development gap: Cross-country comparisons and a within-country study of Kenya, *World Bank Policy Research Working Paper No. 6592*. World Bank.
- Andrianaivo, M., & Kpodar, K. (2011). ICT, financial inclusion, and growth: Evidence from African countries. *IMF Working Papers*, 11(73), 1–46. <https://doi.org/10.5089/9781455227068.001>
- Andrianaivo, M., & Kpodar, K. (2012). Mobile phones, financial inclusion, and growth. *Review of Economics and Institutions*, 3(2), 1–30. <https://doi.org/10.5202/rei.v3i2.75>
- Anifowose, O. L., & Chummun, B. Z. (2025). A panel data analysis of determinants of financial inclusion in Sub-Saharan Africa (1999–2024). *Journal of Risk and Financial Management*, 18(5), 275. <https://doi.org/10.3390/jrfm18050275>
- Babajide, A. A., Adegboye, F. B., & Omankhanlen, A. E. (2015). Financial inclusion and economic growth in Nigeria. *International Journal of Economics and Financial Issues*, 5(3), 629–637.
- Brune, L., Giné, X., Goldberg, J., & Yang, D. (2011). Commitments to save: A field experiment in rural Malawi, *Policy Research Working Paper No. 5748*. World Bank.
- Casanova, L., & Dutta, S. (2018). Banks, credit constraints, and the evolving role of financial technology. In L. Casanova & S. Dutta (Eds.), *Financing entrepreneurship and innovation in emerging markets*. Elsevier
- Committee for Development Policy (CDP). (2018). Lessons learned in developing productive capacity: Fourteen case studies, Background Paper No. 37. *United Nations*. <https://www.un.org/development/desa/dpad>
- Central Bank of Nigeria. (2012). National financial inclusion strategy: *Summary report*. CBN.
- Central Bank of Nigeria. (2015). *Statistical bulletin* (Vol. 23). CBN.
- Dai-Won, K., Jung-Suk, Y., & Hassan, M. K. (2018). Financial inclusion and economic growth in OIC countries. *Research in International Business and Finance*, 43, 1–14.
- David, L. (2013). Financial inclusion: Key to economic and social development. *CSR Mandate*, June–July, 14–17.
- Demirgüç-Kunt, A., Klapper, L., Singer, D., Ansar, S., & Hess, J. (2018). *The Global Findex database 2017: Measuring financial inclusion and the fintech revolution*. World Bank.
- Demirgüç-Kunt, A., Klapper, L., Singer, D., & Ansar, S. (2021). The Global Findex database 2017: Measuring financial inclusion and opportunities to expand access to financial services. *World Bank Economic Review*. <https://doi.org/10.1093/wber/lhz013>
- Enueshike, P., & Okpebru, O. O. (2020). Effects of financial inclusion on economic growth in Nigeria (2000–2018). *IOSR Journal of Research & Method in Education*, 10(1), 44–49.
- Eze, E., & Alugbuo, J. C. (2021). Financial inclusion and poverty reduction in Nigeria: A survey-based analysis. *GSC Advanced Research and Reviews*, 7(3). <https://doi.org/10.30574/gscarr.2021.7.3.0127>
- Guru, K. B., & Yadav, I. S. (2019). Financial development and economic growth: Panel evidence from BRICS. *Journal of Economics, Finance and Administrative Science*, 24(47). <https://doi.org/10.1108/JEFAS-12-2017-0125>
- Hariharan, G., & Marktanner, M. (2012). *The growth potential from financial inclusion*. Atlanta Fed/GSU.
- Ima, A., Ali, Q., Sudrajat, O. Y., Rusgianto, S., Nu'man, H., & Aspiranti, T. (2024). Does digital financial inclusion forecast sustainable economic growth? *Journal of Open Innovation: Technology, Market, and Complexity*. <https://doi.org/10.1016/j.joitmc.2024.100262>

- Khan, A. A., Hidthir, M. H. B., Mansur, M., & Ahmad, Z. (2025). Role of financial inclusion in enhancing the effect of remittance on economic growth in developing countries. *Cogent Economics & Finance*, 13(1). <https://doi.org/10.1080/23322039.2025.2476093>
- Levine, R. (1997). Financial development and economic growth: Views and agenda. *Journal of Economic Literature*, 35(2), 688–726.
- Levine, R., Loayza, N., & Beck, T. (2000). Financial intermediation and growth: Causality and causes. *Journal of Monetary Economics*, 46, 31–77.
- Migap, J. P., Okwanya, I., & Ojeka, G. (2015). Financial inclusion for inclusive growth: The Nigerian perspective. *International Journal of Information Technology and Business Management*, 37(1), 1–8.
- Nguling'wa, P. B. (2019). The impact of financial inclusion on economic growth in Sub-Saharan Africa. *Journal of Applied Economics and Business*, 7(4), 51–68.
- Nwafor, C. M., & Aremu, I. Y. (2018). The nexus between financial inclusion and economic growth: Evidence from Nigeria. *International Journal of Research and Innovation in Social Science*, 2(4).
- Nwankwo, O., & Nwankwo, O. N. (2014). Sustainability of financial inclusion to rural dwellers in Nigeria. *Research Journal of Finance and Accounting*, 5(5), 24–31.
- Ozili, P. K. (2022). Financial inclusion and sustainable development: An empirical association. *Journal of Money and Business*. <https://doi.org/10.1108/JMB-03-2022-0019>
- Sarma, M., & Pais, J. (2011). Financial inclusion and development. *Journal of International Development*, 23, 613–625. <https://doi.org/10.1002/jid.1698>
- World Bank. (2017). *Financial inclusion in Malaysia: Distilling lessons for other countries*. World Bank Group.
- World Bank. (2022). *Nigeria: Urgent choices to reduce vulnerability and unlock growth*. World Bank Group.
- Zins, A., & Weill, L. (2016). The determinants of financial inclusion in Africa. *Review of Development Finance*. Elsevier.