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DETERMINANTS OF FINANCIAL INCLUSION AMONGST RURAL ENTERPRISES A CASE STUDY OF EBONYI STATE

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ABSTRACT

This study examines the determinants of financial inclusion among rural enterprises in Ebonyi State, Nigeria, with a focus on the usage of mobile banking, agency banking/Point-of-Sale (POS), Automated Teller Machine (ATM)/debit cards, and Unstructured Supplementary Service Data (USSD) platforms. Primary cross-sectional data were collected in 2025 from 169 rural enterprises across the three senatorial zones of Ebonyi state. The study employs descriptive statistics and ordered logistic regression techniques to analyse how educational attainment, age, gender, phone compatibility, perceived security, and ease of use influence the intensity of financial inclusion channel usage. The results show that educational attainment is the most consistent and statistically significant determinant of financial inclusion across all channels, highlighting the critical role of human capital in digital financial adoption. Age and gender are not statistically significant, suggesting that financial inclusion among rural enterprises is driven more by necessity and functionality than by demographic characteristics. The findings further indicate that financial inclusion in rural Ebonyi State is predominantly transactional, centred on transfers, payments, and cash withdrawals, with limited engagement in savings, credit, and insurance services. The study concludes that deepening financial inclusion in rural economies requires more than expanded access. It recommends targeted financial literacy programmes, improved trust-building mechanisms for digital platforms, user-friendly service design, and enhanced rural digital infrastructure to promote meaningful financial inclusion and enterprise development.

Keywords: Financial Inclusion; Rural Enterprises; Digital Financial Services; Financial Inclusion Channels; Nigeria.

JEL Codes: G21, O16, O17, C25, R11

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1. Introduction

A well-functioning financial system plays a critical role in promoting economic growth and development by mobilising savings, facilitating investment, and enabling efficient allocation of resources (Levine, 1993). In developing economies, especially in rural settings, access to formal financial services is increasingly recognised as a key driver of enterprise development, income generation, and poverty reduction. Jiao (2014) argues that sound and inclusive financial systems are particularly important for rural economies, where small firms and household enterprises constitute the backbone of local economic activity. However, despite global efforts to expand access to finance, financial exclusion remains widespread, especially in Sub-Saharan Africa.

Evidence from the *Global Financial Development Report* (2014) shows that only about 58 percent of adults worldwide had access to a formal bank account or mobile money services as of 2014, with Sub-Saharan Africa recording some of the lowest inclusion rates. In response, financial inclusion has emerged as a major policy tool for fostering inclusive growth, reducing poverty, and supporting rural enterprise development (Demirgüç-Kunt et al., 2018; Beck et al., 2007). In Nigeria, the Central Bank of Nigeria (CBN) launched the *National Financial Inclusion Strategy* in 2018, targeting an inclusion rate of 80 percent by 2020. Despite the expansion of financial inclusion channels such as mobile money, microfinance institutions, agent banking, point-of-sale (POS) services, and Unstructured Supplementary Service Data (USSD), the national target remains unmet as of 2025, particularly in rural areas.

Ebonyi State presents a compelling context for examining financial inclusion among rural enterprises. The state is predominantly rural, with small-scale agricultural and non-agricultural enterprises accounting for a significant share of economic activity. According to the National Bureau of Statistics (2020), Ebonyi State has a poverty incidence of about 43.5 percent, with rural communities disproportionately affected. Field observations further reveal a stark spatial imbalance in access to formal banking infrastructure: only four out of the seventeen local government areas (LGAs) in the state, namely Abakaliki, Ebonyi, Afikpo, and Ohaozara, have more than two commercial bank branches, while the majority of LGAs have none. In some cases, banking facilities are located within federal institutions and offer limited services, excluding credit provision. Consequently, rural entrepreneurs are often compelled to travel long distances to access basic financial services, increasing transaction costs and discouraging financial participation.

Despite a growing body of empirical literature linking financial inclusion to enterprise growth, income expansion, and poverty reduction, there remains limited sub-national evidence on the determinants of financial inclusion among rural enterprises in Nigeria, particularly in Ebonyi State. Most existing studies rely on national-level data or focus predominantly on urban areas, thereby neglecting localized structural and behavioural constraints that shape financial inclusion outcomes in

rural economies. Consequently, there is a need to empirically examine the specific socio-economic and technological factors influencing financial inclusion among rural enterprises in Ebonyi State.

In line with this identified gap, the study seeks to provide answers to the following research questions:

- a) Does educational attainment significantly affect financial inclusion among rural enterprises in Ebonyi State?
- b) Do the age of the enterprise and the age of the enterprise owner significantly influence financial inclusion among rural enterprises in Ebonyi State?
- c) Does phone compatibility and ease of access significantly influence financial inclusion among rural enterprises in Ebonyi State?

Research Objectives

- a) To examine the effect of educational attainment on financial inclusion among rural enterprises in Ebonyi State.
- b) To determine the influence of enterprise age and owner's age on financial inclusion among rural enterprises in Ebonyi State.
- c) To investigate the impact of phone compatibility and ease of access on financial inclusion among rural enterprises in Ebonyi State.

2. Literature Review

2.1 Theoretical Literature

Financial Intermediation Theory

Continues to receive strong empirical support in recent financial inclusion scholarship, particularly in developing and sub-Saharan African contexts. Recent Global Findex evidence shows that despite improvements in account ownership, significant credit constraints persist for small and rural enterprises due to documentation gaps, lack of collateral, and risk assessment challenges (Demirgüç-Kunt et al., 2018; Demirgüç-Kunt et al., 2022). Consistent with the credit rationing model of Stiglitz and Weiss (1981), newer studies confirm that small firms are more likely to be denied credit or discouraged from applying because lenders perceive them as high-risk under asymmetric information conditions (Ozili, 2018; Lyons & Kass-Hanna, 2021). In sub-Saharan Africa, limited credit histories and informality significantly reduce SME access to formal finance, reinforcing Diamond's (1984) delegated monitoring argument that high monitoring costs constrain lending to dispersed rural enterprises (Babajide et al., 2020; Umar et al., 2021). Recent cross-country analyses further demonstrate that enterprise size, digital financial footprints, financial literacy, and asset ownership remain strong predictors of financial inclusion outcomes (Allen et al., 2016; Demirgüç-Kunt et al., 2022). For rural enterprises in Ebonyi

State, persistent informality, weak bookkeeping practices, and limited integration into digital finance ecosystems amplify information asymmetries and strengthen the explanatory relevance of Financial Intermediation Theory.

Institutional Theory

This theory gained renewed relevance in contemporary financial inclusion discourse, particularly in explaining structural and policy-driven determinants of access. Recent literature highlights that institutional quality, especially regulatory effectiveness, property rights protection, and financial sector governance, significantly influences SME participation in formal finance (Beck et al., 2003; Demirgüç-Kunt et al., 2022). Studies focusing on African economies show that weak land titling systems and ineffective contract enforcement reduce the usability of collateral and increase lender risk premiums, thereby limiting rural enterprise inclusion (Lyons & Kass-Hanna, 2021; Ozili, 2018). Furthermore, emerging research emphasizes that national financial inclusion strategies, digital finance regulation, and credit infrastructure reforms (such as credit bureaus and movable collateral registries) can mitigate institutional barriers and expand SME access (World Bank, 2022; Babajide et al., 2020). In Nigeria specifically, institutional bottlenecks, including bureaucratic registration processes, inconsistent policy implementation, and limited rural financial infrastructure, continue to shape enterprise-level financial outcomes (Umar et al., 2021). Thus, Institutional Theory remains essential for explaining how governance frameworks, regulatory systems, and policy design interact with firm-level characteristics to determine the depth and sustainability of financial inclusion among rural enterprises in Ebonyi State.

2.2 Empirical Literature

The financial inclusion agenda in developing economies is commonly framed within an access-to-finance context where inclusion outcomes reflect the interaction of supply-side enablers (regulation, competition, infrastructure and provider reach), demand-side drivers (income, education, age, digital literacy), and structural barriers (distance, documentation/KYC constraints, and transaction costs) (World Bank, 2014). Within this context, Nigeria has pursued multiple policy pathways, from public-sector credit schemes and microfinance-oriented programmes to systemic reforms such as the National Financial Inclusion Strategy and the cashless policy, aimed at extending affordable financial services to underserved populations (Njoku et al., 2013; Rami, 2017). Yet, the persistence of exclusion in rural settings suggests that expanding channels and programmes may be insufficient when institutional weaknesses, low capability, and infrastructural constraints limit translation of “availability” into “effective usage” (World Bank, 2015; Mutsonziwa, 2016). This access-to-finance framing is particularly relevant for rural enterprise environments where physical branch scarcity has encouraged reliance on alternative channels, mobile banking, POS/agency banking, ATMs/debit cards, and USSD, intended to compress distance costs and expand participation (Oliveira et al., 2014; IFC/World Bank Group, 2018).

The Technology Acceptance Model (TAM) argues that uptake is driven primarily by perceived usefulness and perceived ease of use (Davis, 1989), while UTAUT extends this by emphasising performance expectancy, effort expectancy, social influence, and facilitating conditions as predictors of intention and actual usage (Venkatesh et al., 2003). Diffusion of Innovations further suggests adoption depends on an innovation's relative advantage, compatibility, and complexity, operating through communication networks and social systems, features that map directly onto rural peer learning and community spillovers (Rogers, 1995). Behavioural intention perspectives also matter: TRA/TPB link adoption to attitudes, subjective norms, and perceived behavioural control (Fishbein & Ajzen, 1975; Ajzen, 1991), with perceived behavioural control closely related to self-efficacy in using digital tools (Bandura, 1982). Beyond “user psychology,” fit-and-context models underline that adoption must match enterprise tasks and operating environments: Task–Technology Fit focuses on alignment between task needs and technology capability (Goodhue & Thompson, 1995), while TOE highlights how technological, organisational, and environmental conditions jointly shape adoption choices (De Pietro et al., 1990). Collectively, these theories predict that education and capability, phone/technology compatibility, perceived security, and ease of use/functionality should be central drivers of financial channel uptake among rural enterprises (Davis, 1989; Venkatesh et al., 2003; Rogers, 1995).

Siano et al. (2020) synthesise evidence and argue that ease of use is the strongest driver of mobile banking adoption, with security concerns and social influence also exerting substantial effects, implying that even where services exist, complexity and fear of fraud suppress usage. This finding supports adoption predictions in TAM/UTAUT that effort expectancy and perceived usefulness are decisive (Davis, 1989; Venkatesh et al., 2003), and it aligns with Rebekah (2015), who cautions that the availability of mobile services does not automatically translate into account ownership among low-income groups, suggesting deeper frictions beyond mere rollout. However, Mishra and Bisht (2013) place comparatively heavier emphasis on security/safety and provider reliability, indicating that in some developing settings users may prioritise risk minimisation over interface simplicity, an empirical emphasis that effectively “tilts” the adoption story toward trust and perceived protection rather than convenience alone. On socio-demographic drivers, Bharali (2018) finds education increases awareness and adoption while age reduces it, reinforcing the argument that human capital shapes the capacity to engage with digital channels, consistent with broader claims that inclusion outcomes depend on users' financial behaviour, competence, and constraints (Mutsonziwa, 2016). Yet, empirical discussions that focus narrowly on mobile banking risk miss the practical reality of rural enterprise finance: agent/POS networks frequently serve as the dominant bridge between cash economies and formal finance, reducing distance costs and providing transaction points closer to rural users (Ian et al., 2013; IFC/World Bank Group, 2018). At the same time, the literature recognises operational weaknesses, agent reliability, liquidity constraints, and transaction security risks that can undermine the inclusion promise of agency banking even when agent density rises (IFC/World Bank Group, 2018). Taken together, the empirical record supports the claim that digital finance can deepen inclusion, but it also disputes any “automatic”

inclusion narrative: some evidence elevates ease-of-use as the binding constraint (Siano et al., 2020), others elevate security and institutional trust (Mishra & Bisht, 2013), while capability factors (education/age) consistently moderate both (Bharali, 2018). This unresolved tension motivates a more integrated, multi-channel empirical test, one that jointly evaluates education, age, phone compatibility, perceived security, and ease of use/functionality across mobile banking, POS/agency banking, ATM/debit cards, and USSD, rather than treating financial inclusion as a single-channel phenomenon.

3. Methodology

Study Area, Research Design, and Data

This study adopts a cross-sectional survey design to examine the determinants influencing the usage of financial inclusion channels among rural enterprises in Ebonyi State, Nigeria. Ebonyi State is located in the South-East geopolitical zone and consists of seventeen local government areas, with a predominantly rural population engaged largely in small-scale trading, farming, and informal enterprise activities. According to the National Bureau of Statistics (2019), the state has an estimated population of approximately 3.24 million, reflecting an annual growth rate of 2.8 percent.

Primary data were collected from rural enterprises across the three senatorial zones of the state. The survey targeted enterprises operating outside major urban centres, including market traders, farmers, small business owners, and roadside vendors. Data collection focused on enterprises that had at least one form of engagement with formal financial services or financial inclusion channels within the study period.

Sample Size and Sampling Technique

The survey was conducted across selected rural communities in each senatorial zone: Ikwo and Onueke (Ebonyi Central), Ezzamgbo and Iboko (Ebonyi North), and Ishiagu and Uburu (Ebonyi South). A non-probability purposive sampling technique was employed to select respondents who met the study's inclusion criteria. This approach was considered appropriate given the study's focus on a specific and relatively homogeneous population of rural enterprises.

Sample size was determined using the Godden (2004) formula for estimating sample size for large populations:

$$ss = \frac{Z^2 p(1 - p)}{C^2}$$

where Z represents the z-value corresponding to a 95 percent confidence level (1.96), p denotes the proportion of the population assumed to possess the attribute of interest (0.5), and C is the confidence interval (0.075). This yielded a minimum sample size of 171 respondents. A total of 175 questionnaires were administered, of which 169 were valid and used for analysis, representing a response rate of 96.6 percent.

Data Collection Instrument and Reliability

Data were collected using a semi-structured questionnaire designed to capture information on enterprise characteristics, usage of financial inclusion channels, and perceptions relating to ease of use, security, and functionality. The questionnaire was administered through direct engagement with respondents, with trained enumerators assisting less literate participants and conducting interviews in the local Igbo language where necessary.

Instrument validity was assessed through expert review, while reliability was evaluated using Cronbach's alpha to test internal consistency. A pilot survey involving 17 respondents was conducted before the main survey. The reliability test produced a Cronbach's alpha coefficient of 0.811, which exceeds the recommended threshold of 0.70, indicating good internal consistency and reliability of the instrument (Churchill, 1979; Sekaran, 2003).

Model Specification

This study is grounded in the Technology Acceptance Model (TAM) developed by Davis (1989), which explains the adoption of technology-based systems. Since financial inclusion channels, POS/agency banking, ATM/debit card services, mobile banking applications, and USSD banking, are technology-driven, TAM provides an appropriate theoretical basis.

TAM posits that technology adoption is determined by perceived ease of use and perceived usefulness. In this study, ease of use (Funct) captures perceived ease of use, while security perception (SecPercep) reflects perceived usefulness and trust in the financial channel. Phone compatibility (PhoneComp) represents the technological requirement for accessing each channel. Education (Educ) improves the ability of rural enterprise owners to understand and operate financial technologies, while age (Age) captures behavioural differences in technology adoption. Based on TAM, financial inclusion through POS (FI_{pos}), ATM (FI_{atm}), mobile banking (FI_{mb}), and USSD (FI_{ussd}) is specified as a function of Age, Educ, PhoneComp, SecPercep, and Funct, consistent with the model equations.

The study models financial inclusion as a channel-specific outcome, recognising that rural enterprises engage differently with distinct financial access platforms. Four dependent variables are specified, representing financial inclusion through Point-of-Sale/agency banking (FI_{pos}), Automated Teller Machines/debit cards (FI_{atm}), mobile banking applications (FI_{mb}), and USSD banking services (FI_{ussd}).

Each financial inclusion channel is modelled as a function of age, educational attainment, phone compatibility, security perception, and functionality. The functional relationships are expressed as:

$$FI_{pos} = f(Age, Educ, PhoneComp, SecPercep, Funct)$$

$$FI_{atm} = f(Age, Educ, PhoneComp, SecPercep, Funct)$$

$$FI_{mb} = f(Age, Educ, PhoneComp, SecPercep, Funct)$$

$$FI_{ussd} = f(Age, Educ, PhoneComp, SecPercep, Funct)$$

The corresponding estimable equations are specified as:

$$FI_{pos} = \beta_0 + \beta_1 Age + \beta_2 Educ + \beta_3 PhoneComp + \beta_4 SecPercep + \beta_5 Funct + \mu_1$$

$$FI_{atm} = \gamma_0 + \gamma_1 Age + \gamma_2 Educ + \gamma_3 PhoneComp + \gamma_4 SecPercep + \gamma_5 Funct + \mu_2$$

$$FI_{mb} = \delta_0 + \delta_1 Age + \delta_2 Educ + \delta_3 PhoneComp + \delta_4 SecPercep + \delta_5 Funct + \mu_3$$

$$FI_{ussd} = \lambda_0 + \lambda_1 Age + \lambda_2 Educ + \lambda_3 PhoneComp + \lambda_4 SecPercep + \lambda_5 Funct + \mu_4$$

where the error terms $\mu_1 - \mu_4$ capture unobserved influences on financial inclusion across channels.

Given the binary nature of the dependent variables, indicating whether an enterprise uses a specific financial inclusion channel, logistic regression is employed as the primary estimation technique. Logistic regression is appropriate for modelling discrete outcomes and allows for the estimation of the probability that an enterprise adopts a given financial channel, conditional on its characteristics and perceptions.

All estimations were conducted using SPSS version 24. Statistical significance was assessed at the 5 percent level. Correlation analysis was also conducted to examine associations among explanatory variables and to check for potential multicollinearity before regression estimation.

4. Results and Discussion

4.1 Result

Table 1: Descriptive Statistics of Respondents and Financial Inclusion Characteristics

Variable	Category / Measure	Frequency	Percent
Gender	Male	82	48.5
	Female	87	51.5
Marital status	Single	42	24.9
	Married	95	56.2
	Divorced	14	8.3
	Widowed	18	10.7
Main occupation	Entrepreneur / Business owner	56	33.1
	Trader	54	32.0
	Farmer	33	19.5
	Others (students, public servants)	26	15.4
Educational attainment	Primary	53	31.4
	Secondary	49	29.0
	Tertiary	52	30.8
	Postgraduate	15	8.9
Bank branch in business location	Yes	2	1.2
	No	167	98.8
Has bank account (last 5 years)	Yes	96	56.8

Variable	Category / Measure	Frequency	Percent
	No	73	43.2
Daily use of financial channels	Mobile banking	96	56.8
	Agency banking / POS	64	37.9
	ATM / Debit card	80	47.3
	USSD	72	42.6
Dominant purpose of use	Transfers/payments	—	Majority
	Cash withdrawal (ATM/POS)	—	Majority
Key self-reported driver	Ease of use	—	Predominant
	Security perception	—	Channel-specific
Major constraint	Network failure	—	Predominant

Source: Authors' Compilation from Field Survey, 2025.

Table 1, presents the descriptive characteristics of respondents and their engagement with financial inclusion channels. The sample is composed of economically active rural enterprise operators, with entrepreneurs, traders, and farmers accounting for over 80% of respondents. Educational attainment is mixed but not extremely low: approximately 39.7% of respondents possess tertiary or postgraduate education, while about 60% have primary or secondary education, indicating moderate human capital heterogeneity among rural enterprises.

Access to traditional banking infrastructure is extremely limited, with nearly all respondents (98.8%) operating in locations without a bank branch. Despite this constraint, more than half of the respondents (56.8%) maintain bank accounts, suggesting that non-traditional financial channels are effectively substituting for physical bank presence in rural areas.

Daily usage patterns indicate that mobile banking is the most frequently used channel, followed by ATM/debit cards, USSD, and agency banking/POS. This confirms that financial inclusion among rural enterprises in Ebonyi State is predominantly driven by digital and agent-based platforms rather than conventional banking services. The dominant purposes of channel use are transfers, receipt of payments, and cash withdrawals, highlighting the transactional nature of financial inclusion in the study area.

Respondents primarily cite ease of use and perceived security as the main drivers of channel adoption, while network failure emerges as the most significant operational constraint across all platforms. These descriptive patterns provide preliminary evidence that capability, usability, and infrastructure quality are central to understanding financial inclusion behaviour among rural enterprises, thereby motivating the econometric analysis that follows.

Table 2: Ordered Logistic Regression Results for Financial Inclusion Channels

Dependent variable: Frequency/intensity of channel usage, estimates reported as Odds Ratios (OR)
(Standard errors in parentheses)

Variables	Mobile Banking	Agency Banking / POS	ATM / Debit Card	USSD
Age	1.012 (0.016) [0.448]	0.987 (0.015) [0.418]	0.987 (0.016) [0.419]	0.982 (0.015) [0.233]
Gender	1.034 (0.313) [0.912]	0.990 (0.293) [0.972]	0.836 (0.260) [0.564]	0.659 (0.197) [0.162]
Years of formal education	1.127* (0.040) [0.001]	1.130* (0.041) [0.001]	1.111* (0.041) [0.004]	1.082 (0.039) [0.027]
Ease of use/functionality	1.039 (0.167) [0.811]	1.272 (0.215) [0.153]	1.356 (0.208) [0.047]	1.318 (0.171) [0.034]
Security perception	1.505 (0.241) [0.011]	1.206 (0.205) [0.271]	1.215 (0.203) [0.245]	0.972 (0.104) [0.788]
Phone compatibility	1.307 (0.192) [0.068]	1.031 (0.148) [0.833]	1.173 (0.167) [0.263]	1.125 (0.127) [0.298]
Observations	169	169	169	169
LR χ^2 (df = 6)	35.18	23.20	21.97	21.13
Prob > χ^2	0.000	0.0007	0.0012	0.0017
Pseudo R ²	0.076	0.053	0.057	0.045

Notes: p-values in brackets, *** p < 0.01, ** p < 0.05, Odds Ratios > 1 indicate increased likelihood of higher usage intensity.

Source: Authors' Compilation from Field Survey, 2025.

Table 2, reports ordered logistic regression estimates for the determinants of financial inclusion channel usage among rural enterprises in Ebonyi State. Across all four models, years of formal education consistently exhibit a positive and statistically significant effect, indicating that higher educational attainment increases the likelihood of more frequent use of financial inclusion channels.

Age and gender are statistically insignificant across all models, suggesting that demographic characteristics do not meaningfully differentiate channel usage intensity among rural enterprises. Security perception is statistically significant only in the mobile banking model, implying that trust in security features is particularly relevant for app-based platforms. Ease of use and functionality significantly influence the adoption of ATM/debit cards and USSD, but not mobile banking or agency banking/POS, indicating that simplicity is more critical for transaction-focused and low-complexity

channels. Phone compatibility does not exhibit statistical significance across the four channels at the 5% level, although it shows marginal relevance for mobile banking.

4.2 Discussion of Findings

This study examined the determinants of financial inclusion channel usage among rural enterprises in Ebonyi State, focusing on mobile banking, agency banking/POS, ATM/debit cards, and USSD. The findings contribute to the growing empirical literature on digital financial inclusion in developing and rural contexts by highlighting the roles of education, usability, trust, and infrastructure.

A central finding of the study is that educational attainment is the most consistent and statistically significant determinant of financial inclusion across all channels. This result strongly corroborates empirical evidence from Bharali (2018), who finds that education significantly enhances awareness and effective use of mobile banking among rural households in India. Similarly, Mishra and Bisht (2013) show that literacy and user understanding are critical in shaping acceptance of mobile banking services in developing economies. In the African context, Siano et al. (2020) demonstrate that education-related capability underpins mobile banking adoption in Nigeria, while Chinoda et al. (2019) emphasise that human capital constraints remain a key driver of financial exclusion across Sub-Saharan Africa. The consistency of education's effect across mobile banking, POS, ATM, and USSD in this study suggests that financial inclusion is fundamentally a capability-driven process, rather than merely a function of physical or digital access.

In contrast, age and gender do not significantly influence financial inclusion channel usage, a finding that both aligns with and extends parts of the empirical literature. While some earlier studies associate younger age cohorts with higher digital adoption, recent evidence indicates that necessity-driven usage in rural enterprise environments may weaken demographic distinctions. Mbiti and Weil (2011), in their study of mobile money adoption in Kenya, argue that widespread mobile penetration and transactional necessity can neutralise age-based differences in financial technology usage. The absence of gender effects in this study is also consistent with Demirgüç-Kunt et al. (2018), who note that digital financial services have the potential to reduce traditional gender gaps in access, particularly in informal and micro-enterprise settings where women are economically active.

The results further show that security perception significantly influences mobile banking adoption but not other channels. This channel-specific effect aligns with Siano et al. (2020), who identify security and fraud concerns as major barriers to mobile banking adoption in Nigeria. Mobile banking platforms often involve app-based interfaces, internet connectivity, and relatively higher transaction limits, increasing users' sensitivity to perceived cyber risks. In contrast, agency banking/POS and ATM services are often perceived as routine and familiar, while USSD transactions are typically low-value and short-lived. This finding is also consistent with evidence from Burundi, where mobile money adoption was found to depend more on transaction frequency than on perceived security features.

(Mobile Banking and Financial Inclusion in Burundi, 2019), suggesting that trust concerns vary across channels and contexts.

Ease of use and functionality emerge as significant determinants for ATM/debit card and USSD adoption, but not for mobile banking or agency banking/POS. This pattern supports Bharali (2018), who finds that usability strongly affects the adoption of basic digital financial services among rural populations with varying literacy levels. USSD, in particular, is designed to operate without internet connectivity and on basic phones, making simplicity a crucial factor for frequent usage. The insignificance of ease of use for mobile banking is consistent with Mishra and Bisht (2013), who argue that once users overcome initial learning costs, usability becomes less influential than trust and perceived benefits. Similarly, reliance on agents in POS banking may reduce the relevance of individual usability perceptions.

Although phone compatibility is frequently cited descriptively, it does not emerge as a statistically significant determinant of usage intensity. This suggests that basic phone access may no longer be the primary binding constraint, particularly given the widespread availability of USSD-compatible devices. However, the dominance of network instability as a major operational challenge strongly aligns with World Bank (2014) evidence, which identifies weak digital infrastructure as a persistent structural barrier to effective financial inclusion in Sub-Saharan Africa. Even where access channels exist, unreliable connectivity constrains consistent and meaningful usage.

The findings indicate that financial inclusion among rural enterprises in Ebonyi State remains largely transactional, concentrated on transfers, payments, and cash withdrawals, with limited engagement in savings, credit, or insurance products. This pattern echoes Beck et al. (2007) and Demirgüç-Kunt et al. (2018), who caution that account ownership and transaction access do not automatically translate into deeper financial intermediation or enterprise growth. While digital and agent-based channels have expanded access, the results suggest that meaningful financial inclusion requires complementary investments in education, trust-building mechanisms, and digital infrastructure to move beyond shallow, transaction-focused inclusion.

5. Conclusion and Recommendations

5.1 Conclusion

This study examined the determinants of financial inclusion channel usage among rural enterprises in Ebonyi State, Nigeria, focusing on mobile banking, agency banking/POS, ATM/debit cards, and USSD platforms. Using survey data from 169 rural enterprises and ordered logistic regression analysis, the study provides evidence on how individual capability, perceived service attributes, and infrastructural constraints shape financial inclusion outcomes in rural settings.

The findings show that educational attainment is the most consistent and robust determinant of financial inclusion across all channels, underscoring the central role of human capital in enabling effective engagement with digital and agent-based financial services. In contrast, demographic characteristics such as age and gender do not significantly influence channel usage, suggesting that necessity-driven adoption in rural enterprise contexts may override traditional demographic barriers.

The study further reveals that security perception plays a decisive role only in mobile banking adoption, while ease of use and functionality significantly influence ATM/debit card and USSD usage, reflecting differences in channel complexity and transaction design. Although phone compatibility is frequently cited descriptively, it does not significantly affect usage intensity, indicating that basic device access is no longer the primary constraint. However, network instability remains a pervasive structural barrier, limiting consistent and effective use of financial inclusion channels.

5.2 Recommendations

The findings of this study carry important policy implications for financial regulators, development agencies, and financial service providers.

First, financial inclusion policies must go beyond access expansion to prioritise capability enhancement. Since education consistently drives adoption across all channels, policymakers particularly the Central Bank of Nigeria and state-level agencies, should integrate financial literacy and digital capability programmes into rural enterprise development initiatives. Targeted training that aligns with enterprise cash-flow cycles and transaction needs would enhance effective usage.

Second, the channel-specific role of security perception suggests that trust-building strategies should be differentiated. Mobile banking platforms, in particular, require stronger consumer protection mechanisms, clearer fraud-redress frameworks, and user-focused communication on security features to build confidence among rural enterprise owners.

Third, the significance of ease of use for ATM and USSD adoption highlights the importance of maintaining simple, low-complexity interfaces for rural users. Financial service providers should continue to design products that minimise cognitive and operational burdens, especially for transaction-oriented services used by low-literacy populations.

Fourth, the persistence of network instability as a major constraint indicates that financial inclusion outcomes are inseparable from broader digital infrastructure development. Investments in network reliability, rural connectivity, and power infrastructure are critical complements to financial sector reforms. Without addressing these structural bottlenecks, the effectiveness of digital financial inclusion initiatives will remain limited.

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