Scaling up Rural Financial Innovations for the Transformation of Inclusive Financial System: Micro-Financing Option in South West, Nigeria

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Abstract
There is growing evidence that designing financially sustainable models which increase outreach and scale of operations for the poor significantly contributes to the productivity of the rural areas. The situation in Nigeria is complex, as financial innovations have not been as effective as hoped in driving an inclusive financial system and providing easy access to financial services for the poor, primary due to challenges like low financial literacy, infrastructure gaps, and a high population growth rate that outpaces financial inclusion growth. Therefore, this study examined the impact of rural financial innovations on the transformation of the inclusive financial system in Nigeria. The study used primary data collected through interviews conducted with local villagers, MFI officials, village/local leaders, and religious personalities. Also, in analyzing the primary data, the study used descriptive and inferential statistics, probit and tobit regression techniques. The study concluded that the financial inclusion agenda has been considered and adopted in a concerted manner. The study recommended that the Central Bank of Nigeria should create a comprehensive regulatory framework for digital banking, which focuses on existing community resources and potentials to stimulate rural financial innovations for a transformative and inclusive financial system.

Key words: Digital banking; Inclusive financial system; Micro financing option; Rural financial innovations; Transformation of financial inclusion

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Introduction

Scaling up rural financial innovations is crucial for achieving sustainable and equitable development, particularly when an inclusive financial system is

driven by innovations. An inclusive financial system provides the users with appropriate financial services, enabling them to become financially secured, economically buoyant, and better able to plan for the future (Nino-Zarazua, Larquemin, and Castellani, 2024).

However, formal financial institutions have faced enduring challenges in providing financial services to the poor, with these difficulties attributed to a range of factors beyond just program design and targeting shortcomings. Systemic failures have prevented the poor, particularly in the rural areas, from achieving full financial inclusion, hindering their access to, usage of, and the quality of financial services they receive.

Evidence from literature has shown that a high percentage of people living in rural areas and those experiencing severe poverty are excluded formal financial services (Eze and Alugbuo, 2021). This is corroborated by Henning-Smith, Evenson, Corbett, Kozhimannil, and Moscovice (2017) that rural dwellers face challenges in accessing financial services due to barriers like banks and branches closures, long distances to reach banking institutions, and poor rural public transportation system. Despite financial services being accessible, some rural dwellers view conventional banking services as expensive and outrageous. This is confirmed by Simatele and Maciko (2022) that high bank charges discourages rural dwellers to patronize formal financial services.

The introduction of technology has reduced costs, making it easier and more affordable to provide financial services to rural populations (Simatele, Dube and Khumalo, 2021). Stringent conditions for opening bank accounts make it difficult for many rural dwellers to become customers. This low patronage has resulted in the closure of many bank branches in rural areas. This led to a surge in informal services providers, who created a wide-ranging of alternative financial services to satisfy the financial needs of rural areas (Rai, Dua, and Yadav, 2019).

In order to promote financial inclusion, both the government and non-governmental agencies have established microfinance programmes and institutions. These initiatives also include government policies and strategies designed to improve the productivity of micro, small and medium-scale enterprises (SMEs) (Kumar, Khurana and Sharma, 2022).

Basically, this requires a closer review of the distribution of their existing products and service areas and how they overlap with communities. Some microfinance institutions (MFIs) have stepped in to service rural poor clients who demand financial services at reasonable costs leading to the development of rural microfinance as a new market niche (Al-Amin and Mamum, 2022). This new niche has the potential to provide millions of rural poor dwellers, who reject conventional microfinance services, access to their compliant financial services that meet their specific needs (Imran, Haq, and Ozcatalbas, 2022).

Also, the surge in the availability of digital financial innovations (Internet and mobile communications) brought about by financial inclusion strategy has made some MFIs' transactions more digitized and convenient, enlarged financing channels, and provided more start-up and working capital for small and medium enterprises. Digital financial inclusion leverages modern technology like mobile phones and the internet to effectively extend financial services to previously unbanked

and under banked populations, enabling them to access a range of banking options through digital channels (Siddik and Kabiraj, 2020; Aziz and Naima, 2021 & Ratnawati, 2021).

Despites all these efforts, there are structural constraints limiting the implementation of digital financial services such as digital literacy, inadequate internet infrastructure, and inability to afford smartphones by rural dwellers (Khobragade et al., 2024 &Vo, Nguyen and Van, 2021).

Digital financial services and online banking offer a crucial alternative for providing financial services in rural areas that lack brick-and-mortar bank branches. However, the adoption of these services faces significant challenges, including internet connectivity, low digital literacy, and lack of trust.

In developing countries, the emergence of digital financial services, especially through mobile technology, has been a transformative force for financial inclusion. Mobile phones are successively bridged infrastructural and geographical gaps by enabling rural population to access essential financial services like savings, credit, and payments without needing a bank account. This approach has been particularly effective, with platforms like M-Pesa in Kenya serving as a prominent example. (Aziz and Naima, 2021). In Nigeria the internet-powered branchless banks (neobanks), such as Waya, Kuda, Opay, VBank, Moniepoint are increasingly popular, offering unified online banking services with convenience and low costs.

Demirgüç-Kunt, Klapper, Singer, Ansar and Hess, (2017) emphasized further that these platforms removed some of the barriers associated with traditional banking in rural areas. Koomson, Martey and Etwire (2023) argued that easy accessibility to digital savings and credit which are important channels for inclusive financial services, can help to reduce rural-urban migration by addressing some of its underlying causes.

Digital banking necessitated comprehensive digital financial literacy, which includes possessing knowledge and understanding of financial services, their utilization, and effective financial management. Furthermore, continuous education and guidance on various digital financial schemes and facilities that can be accessed are essential for users to stay informed and make sound decisions (Singh, 2022).

In developing countries, women often face barriers to access financial services due to socio-cultural customs, such as limited mobility, decision-making power, and ownership of assets, as well as lower digital literacy levels. Additionally, infrastructural gaps, like unreliable internet connectivity and high costs of mobile devices like smartphones, further restrict access to digital financial services, especially in rural areas. Poor infrastructure and unreliable internet connectivity disproportionate impact rural communities, hindering the adoption of digital payments and online financial services. (Mujeri and Azam, 2018 & Aziz and Naima, 2021).

In Nigeria, the growth of digital banking, including neobanks, occurred alongside the increased adoption of point-of-sale services (POS) terminals and automated teller machines (ATM). While POS and ATMs were earlier drivers of electronic payment, neobanks emerged later, using technology to create a new model of branchless banking. These digital-first services, along with widespread POS and ATMs agent networks, are crucial for expanding financial inclusion and reducing poverty in rural areas (Iriobe, Williams,

Ayodele and Taofeek, 2021).

Neobanks have disrupted the financial sector by offering a seamless online banking experience, low transaction fees, and innovative services that improve accessibility, usage and quality to consumers.

Recognizing and addressing limitations in previous studies, this research examined the benefits of neobanks' financial innovations. It specifically considered the characteristics and the local contexts of the communities within the study areas. The approach provided more robust results, suitable for policy making. This departure filled existing research gaps and formed a significant part of our contribution to knowledge.

Therefore, this study examines the role of financial innovations (cutting-edge technologies) in transforming the inclusive financial system and addresses their limitations in serving rural areas.

The rest of the paper are as follows: Section two deals with literature review, while section three is methodology, section four presents research findings and section five contains conclusion and recommendations.

Literature Review

Theoretically, financial literacy theory of financial inclusion forms the bedrock of rural financial innovation in the transformation of inclusive financial system. Naturally, finance influences not only the efficiency of resource allocation throughout the economy but also the comparative economic opportunities of individuals from relatively rich to poor households. Stein and Yannelis (2020) argument is that the accessibility of financial services and products can be seen as an investment in human capital, as it can equip individuals with the necessary resources and tools to enhance their economic situation (Huang, Gu, Lin, Alharthi, and Usman , 2023). This may be difficult due to lack of financial literacy among the rural dwellers. However, given the phasing out of bank branches and lacking of brick-and-mortar banking services in the rural areas in Nigeria there is need for high level of financial literacy to be inculcated into the lives of rural people so as to be able to cope with new high tech development in financial innovation in Nigeria. Although, the technological and information innovation brought about by financial inclusion has made transactions more digitized, convenient, and broadened financing channels (Bastante, 2020) but the use of technology is proportionally related to age and education level (Piotrowska, 2024). Definitely, financial literacy theory of financial inclusion assumption is that financial inclusion should be achieved through education that increases the financial literacy of citizens. Corroborating this, evidence from sub-Saharan Africa indicates that adults with a tertiary or higher education are over four times more likely to have access to formal bank accounts compared to those with only a primary or lower level of education (UNDP, 2016). Desai, Bhatt and Raval (2023) stress further that illiteracy is a significant obstacle to financial inclusion in rural areas. Often, illiteracy rates are inversely connected with the inclusiveness of financial services and products levels (Elzahi, 2022). For instance, majority of rural dwellers are illiterates and this is a great barrier to the inclusiveness of financial services in rural areas (Hassan, 2022; Hassouba, 2023 & Mossie, 2023). This is further reiterated by Liew (2020); Morgan and Long (2020); Chowdhury and Chowdhury (2023) & Hossain, Ibrahim

and Uddin (2023) that people who lack literacy find it difficult to manage their finances, get financial services, and comprehend financial goods. The pro arguments of the financial literacy theory are that the digital financial services of the online intelligent payment system serves as the framework that many enterprises relying on as transaction method, which significantly contributes to employment and entrepreneurship (Rotatori, Lee and Sleeva, 2021 & Senyo, Gozman and Karanasios, 2023). Also, at the micro level, financial inclusion has reshaped all walks of life. So, financial inclusion demonstrates the characteristics of digital transactions, intelligent products, and humanized services, which encourage enterprises to introduce and develop new technologies, and even reshape business models. Moreover, the expansion of financing channels makes enterprises more willing to invest in new technologies and equipment. Therefore, digital savings and access to digital credit are important channels for inclusive financial services to promote entrepreneurship (Koomson, Martey and Etwire, 2023). While the strong argument against the theory is that having financial literacy cannot guarantee that people will use financial services, most especially when they lack money, which is capacity to partake in one or more transactions. This is a typical rural areas trait where majority of the households are poor. It implies that being financial literate without money (capacity) cannot make one to participate in the financial sector. This argument and observation are very relevant to Nigeria situation where majority of populace are poor and not financially buoyant.

Empirical Review

Empirically, many studies have shown the linkage between financial literacy and financial performances, financial security, self-confident, and improved quality of life (Kaiser, Lusardi, Menkhoff, and Urban 2022; Loomis 2018). In Kenya Jack and Suri, (2014) & Fanta and Makina, (2019) found that M-Pesa App improves household income and reduce poverty. In their studies, Critchfield, Dey, Mota, and Patrabansh, 2019) observed that even though the online platforms and mobile apps provide financial services at lower fees but rural dwellers prefer to patronize bricks and mortar banks. Also, Kemal (2019) study established that there is a positive relationship between mobile banking, financial inclusion and economic growth in Pakistan. In addition, Aziz and Naima, (2022) found that mobile banking improves the financial access of rural dwellers in South Africa. Furthermore, Sharif, Naghavi, Hassam and Waheed (2022) observed that education reduced the gender gap in financial inclusion in low-income countries. In another perspective, Bhuiyan, Uddin and Milon (2023) study found that adoption of ICT infrastructure which facilitates the growth of digital financial services promote growth in developing countries. In their study, Sarfo, Musshoff and Webe (2023) results showed that financial literacy has a positive and significant impact on farmers' awareness of digital credit, and the improvement in education level increase people's efficiency in using the conveniences created by financial inclusion. Similarly, Sarwar, Diepeveen and Moreno (2023) established that the use of digital financial services in cash transfer has facilitated easy accessibility to financial services by the neglected rural areas. More so, Orazi, Lisana, and Vigiers (2025) results showed that age, income, education and gender of the mobile

account ownership improve digital financial inclusion that promotes inclusive growth in four Latin American nations ((Argentina, Brazil, Colombia, and Peru). Finally, Sarker and Rahman (2025) study observed that digital banking transformation bridged the financial gaps but there are problems of lack of infrastructure, digital illiteracy and gender inequalities in Bangladesh.

This study deviated from previous studies by examining three dimensions of financial inclusion: accessibility, usage, and quality of financial services on digital banking. Accessibility refers to the physical and digital availability of financial services, usage captures the frequency and extent to which these services are employed, and quality pertains to the appropriateness of services in meeting users' needs. These dimensions shape the ability of marginalized populations to participate in the formal economy and improve their financial well-being.

Also, taking into cognizance that mobile and internet banking are crucial to empowering marginalized communities in Nigeria, so rural dwellers with internet access can enjoy online banking services without leaving their localities. In addition, the study considered the benefits of these neobanks' financial innovations based on characteristics of each community and their local contexts in the study areas. From this perspective, financial exclusion gaps are significantly bridged. Therefore, addressing key challenges like accessibility (smartphone possessions) usage (internet facilities) and quality of the services (satisfaction) as barriers serve as innovative solutions that prioritize the unique needs of underserved populations. Consequently, these formed part of our contributions to existing knowledge.

Methodology

The study delved more on the local circumstances of the communities within the study area to determine their varying financial needs in terms of facilities on ground in order to develop the suitable local financial innovations for proper transformation of inclusive financial system in Nigeria using micro financing option.

Data Collection Procedures

The information was collected by trained staff who had prior meetings with local villagers, local government officials, village/local leaders, and farmers/artisans in the study area. During the meetings, these respondents verbally agreed to participate. Also, because local communities were intimately familiar with their own needs and economic situations, their active participation and engagement proved vital to the study's success.

The primary data was sourced with the use of interviews carried out by well-trained staff in the study area covering the six states making up the South West zone in Nigeria. The zone comprised of Oyo, Ogun, Ondo, Osun, Ekiti and Lagos states. Twenty (20) respondents were selected from each of the three (3) villages selected from each state, making a total of three hundred and sixty (360) respondents for the study. The reason for choosing South West zone is because it has the highest number of banks and microfinance banks in Nigeria. As at June, 2021 the total number of microfinance banks registered with Central Bank of Nigeria was 876 out of which 324 were from South West zone. Also, out of 4,437 commercial bank branches in Nigeria as at July 2023, South-West zone having 1920 branches, being a highly concentrated area of bank branches in Nigeria (The Nigerian Financial Services

Market Report, 2023).

The interviews provided detail information on the respondents and contains a large set of questions regarding the account ownership in terms of accessibility (smartphone possessions), usage (availability of internet facilities) and quality of the services (satisfaction) as barriers affecting them. Also, their social-economic characteristics including age, income, gender, occupation, other sources of microfinance, proximity to banks (distance), bank charges (cost), household savings, digital financial services (Waya, Kuda, Opay, VBank, and Moniepoint) and financial literacy (education) were used for the estimation in this study.

Method of data analysis

The study used Probit model to determine the relationship between dimensions of inclusive financial system and a number of socioeconomic and rural financial services characteristics. The outcome response variable is coded as one or zero; 1 for yes and 0 for no. The perception of barriers to using financial services is coded as a binary variable, where a value of '1' indicates the individual perceives a barrier, and a value of '0' indicates the individual does not. The unit of analysis in this study is the individual. Probit was used to estimate the probability that an individual with certain socioeconomic characteristics is affected by key challenges like accessibility (smartphone possessions), usage (availability of internet facilities) and quality of the services (satisfaction) as barriers. Addressing these barriers served as innovative solutions that prioritize the unique needs of underserved populations. The model is expressed as follows:

$$y_i^* = x'\beta + u_i \quad (1)$$

The probit models take as the dependent variable, y_i, the perception of barriers of access, usage and quality of financial services (1 if the person perceives the barriers and 0 if not) by respondent ;; the unit of the study is the individual. It assumed that the perception of barriers to access, usage and quality depend on a latent variable y* which is determined by a set of exogenous variables, included in vector x', so that:

$$y_i = 1 \; if \; y_i^* > 0; \;\; y_i = 0 \; if \; y_i^* \leq 0 \quad (2)$$

where the subscript i represents individuals. The vector represents the parameters of the model and u is a normal distribution error term of average 0 and variance 1.

In line with our conceptual framework calibration and the theoretical arguments, the author specifies the equation based on adopting and modifying works of Sarwar, Diepeveen and Moreno (2023) by including age of the household, education, access to other sources of micro-financing (informal) etc. as the case may be arising from the Probit regression specification above, the Probit model for this study is however operationalized empirically in this study stated as follows:

$$Y_1 = \alpha_1 + \beta_{11}X_1 + \beta_{21}X_2 + \cdots\cdots\cdots\cdots\cdots\cdots + \beta_n X_n \quad (3)$$

$$Y_2 = \alpha_2 + \beta_{12}X_1 + \beta_{22}X_2 + \cdots\cdots\cdots\cdots\cdots\cdots + \beta_n X_n \quad (4)$$

$$Y_3 = \alpha_3 + \beta_{13}X_1 + \beta_{23}X_2 + \cdots\cdots\cdots\cdots\cdots\cdots + \beta_n X_n \quad (5)$$

The study model is specified as follows:

$$Yi = f\,(AGE, OTH\_SOURS\_MF, COST, DISTANCE, EDU\_HH, GEND\_HH, HH\_OCCUP, INCOME\_HH, DFS, SAVINGS) \quad (6)$$

Thus, financial inclusion system is a binary variable that takes the value 1 if the person fulfills at least one of the three conditions, and 0 otherwise. This dependent variable Y_i is the perception of attributes (barriers) to the use of financial services, 1 if the person perceives the barriers and 0 if not); the unit of the study is the individual. Thus Y_1, Y_2, and Y_3 are probability of rural dwellers perception of barriers to access micro-finance: (i) accessibility (smartphone possession); (ii) usage (availability of internet facilities) and (iii) quality (satisfaction).

X_j……X_n represent vector of the explanatory variables

β_i……..β_n represent the parameter or coefficients

ε represents the independent distributed error term and α_1, α_2 and α_3 show the intercept or constraint term.

In line with the study, three micro level models are stated as follows:

Model 1 (Objective 1): Accessibility (smartphone possession)

$$ACCESS_1 = \alpha_1 + \beta_{1,1} AGE_1 + ,\beta_{2,1} EDU_{HH_2} + \beta_{3,1} GEND_{HH_3} + \beta_{4,1} HH_{OCCUP_4} + \beta_{5,1} INCOME_{HH_5} + \beta_{6,1} OTH_{SOURS_{MF_6}} + \beta_{7,1} COST_7 + \beta_{8,1} DISTANCE_8 + \beta_{9,1} DFS_9 + \beta_{10,1} SAVINGS_{10} + \varepsilon_i \quad (7)$$

Model 2 (Objective 2): Usage (availability of internet facilities)

$$USAGE_2 = \alpha_2 + \beta_{1,2} AGE_1 + ,\beta_{2,2} EDU_{HH_2} + \beta_{3,2} GEND_{HH_3} + \beta_{4,2} HH_{OCCUP_4} + \beta_{5,2} INCOME_{HH_5} + \beta_{6,2} OTH_{SOURS_{MF_6}} + \beta_{7,2} COST_7 + \beta_{8,2} DISTANCE_8 + \beta_{9,2} DFS_9 + \beta_{10,2} SAVINGS_{10} + \varepsilon_i \quad (8)$$

Model 3 (Objective 3): Quality (satisfaction)

$$QUALITY_3 = \alpha_3 + \beta_{1,3} AGE_1 + ,\beta_{2,3} EDU_{HH_2} + \beta_{3,3} GEND_{HH_3} + \beta_{4,3} HH_{OCCUP_4} + \beta_{5,3} INCOME_{HH_5} + \beta_{6,3} OTH_{SOURS_{MF_6}} + \beta_{7,3} COST_7 + \beta_{8,3} DISTANCE_8 + \beta_{9,3} DFS_9 + \beta_{10,3} SAVINGS_{10} + \varepsilon_i \quad (9)$$

Variables identification

The model considers both endogenous and exogenous variables. With respect to endogenous variables, the analysis of barriers to financial services using endogenous variables is based on the research survey question referring to the reasons for not having an account with a financial institution. These questions are classified into 3 categories according to the options in the answer: (i) Accessibility (do not possess smartphone) (ii) usage (no internet facilities or infrequent internet services) and (iii) quality of the financial services (not satisfied).

The endogenous variables include:

ACCESS = Accessibility (smartphone possessions)

USAGE = Availability of internet facilities

QUALITY = Quality of financial services (satisfaction)

The Probit models are fitted to estimate these categories using the exogenous variables described below. The exogenous variables considered are those that in accordance with the literature and availability of research survey data that may influence financial inclusion.

The Exogenous (Explanatory) Variables include:

Household Characteristics:

AGE = Age of the head of household (years)

EDU_HH = Education of the head of household (years)

GEND_HH = Gender of the head of household (male = 1, female = 0)

HH_OCCUP = Occupation of the head of household (farming = 1, non-farm = 0)

INCOME_HH = Head of the household income

Micro financing variables

OTH_SOURS_MF = Other Sources of Micro-financing

COST = Cost of transactions

DISTANCE = Geographical distribution of micro-financing

DFS = Digital financial services

SAVINGS_HH = Head of Household Savings

4.0 Findings

4.1 Descriptive and Inference analysis

The table 4.1 below contained the results of the study survey carried out on 360 households in six states in the south west of Nigeria. Although, evident from literature have shown that digital financial inclusion enhances the provision of financial services to unbanked and under banked (Siddik and Kabiraj, 2020 & Ratnawati, 2021) by using digital technology such as mobile phones, the Internet, and other electronic channels (Aziz and Naima 2021). However, our study survey results validated Aziz and Naima (2021) and Mujeri and Azam (2018) findings that infrastructural gaps, such as unreliable internet connectivity and high smartphone costs limit access in rural areas.

For example, the results in table 4.1 above and figures 1, 2 and 3 below showed that 210 (58.33% of 360) households have no internet facilities in their areas, while 148 (41.11% of 360) households do not have smart phones and 230 (68.89% of 360) households are not satisfied with the financial services being rendered in the study area. The inability to have good usage (satisfaction) was majorly caused by lack or infrequent internet facilities (quality) and non-possession or ineffective smart phones (access). This is also manifested in table 4.2 below which showed that out of 210 households that lacked internet facilities 115 (54.25% of

212) households have smart phones while out of 150 households that have internet facilities 53 (35.81% of 148) households do not have smart phones.

Table 4.1: Summary of Survey Data

Variables	Measures	Responses	Percent	Observations
Quality	No internet	0	58.33	210
	Having internet	1	41.67	150
Access	No smartphone	0	41.11	148
	Having smartphone	1	58.89	212
Usage	Not satisfied	0	63.89	230
	Satisfied	1	36.11	130
Age of the households	18-25 years	1	11.11	40
	26-35 years	2	33.06	119
	36-45 years	3	7.22	26
	46-55 years	4	12.78	46
	56-65 years	5	33.06	119
	66 and above	6	2.78	10
EDU_HH (Educational Qualification)	Primary	1	31.67	114
	Secondary	2	54.44	196
	Tertiary	3	13.89	50
GEND_HH	Male	1	59.72	215
	Female	2	40.28	145
HH_OCCUP	Farming	1	51.39	185
	Others	2	48.61	175
INCOME_HH	US$3.36 - US$10.07	1	37.50	135
	US$10.08 - US$16.78	2	21.67	78
	US$16.79 - US$26.85	3	16.94	61
	US$26.86 - US$40.27	4	10.56	38
	US$40.28 - US$46.98	5	6.38	23
	Above US$46.98	6	6.94	25
OTH_SOURCE_MF	Micro finance banks	1	32.50	117
	Money lenders	2	16.94	61
	Friends/Relatives	3	10.54	38
	Savings group/club	4	28.61	103
	Cooperative Society	5	10.83	39
	Rotational credits	6	0.56	2
COST Bank charges	High charges	1	80.00	288
	Multiple charges	2	20.00	72
DISTANCE (Distance to the nearest bank)	Less than 15 minutes	1	17.22	62
	Between 15 and 25 minutes	2	0.28	1
	Between 25 and 50 minutes	3	48.06	173
	More than 50 minutes	4	34.44	124
DFS (Digital financial services)	Waya	1	3.89	14
	Kuda	2	5.00	18
	Opay	3	65.28	235
	VBank	4	9.44	34
	Moniepoint	5	16.39	59
Savings	No savings A/C	1	38.33	138
	Having savings A/C	2	61.67	222

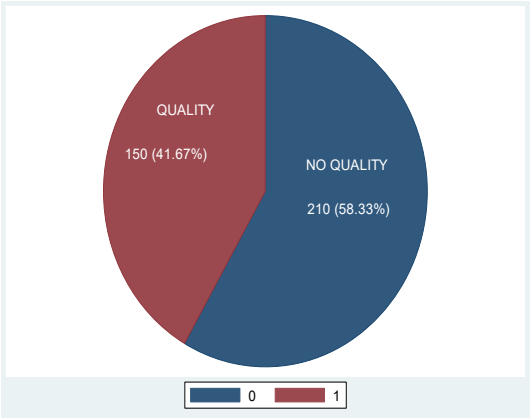

Figure 2: Access

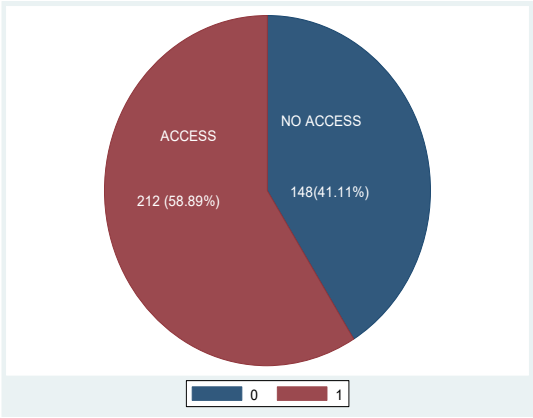

Figure 1: Quality

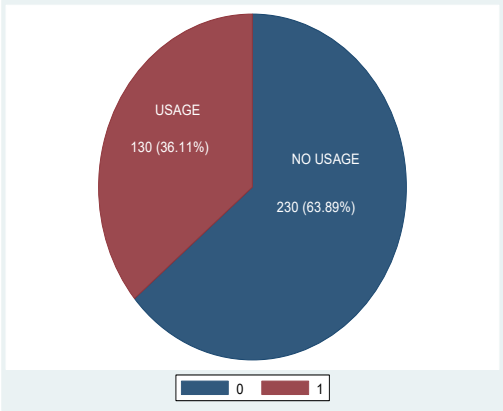

Figure 3: Usage

Also, the results showed that out of 150 that have internet facilities only 65 (50% of 130) households are satisfied with the financial service being provided. In addition, the results showed that out of 212 households that possessed smart phones 130 (56.96% of 230) households are not satisfied with the financial services rendered in the study area. In the appendix table 1 below the spearman's rank correlation results corroborated that there is a positive weak correlation (0.1271*) relationship between quality and usage but highly significant. Also, there is a positive weaker correlation (0.0992) between quality and access and (0.0522) between access and usage. All these accounted for lack of infrastructural facilities which are

hindering the easy accessibility to digital banking in most of the rural areas under the study. This is confirmed by Bhuiyan, Uddin and Milon (2023) study, which found that adoption of ICT infrastructure which facilitates the growth of digital financial services promote growth in developing countries Therefore, these infrastructural gaps must be fixed immediately.

Majority of the households within the average age ranging from 26 to 65 years (310) (Fig. 4) engaged in farming (185 (51.39%)), which is the characteristic of rural areas (Fig. 5). Within this age range of 310 households, even though 174 (56.13%) have smart phones (Table 4.3) but only 116 (37.42%) have access to internet facilities (Table 4.3) and 199 (86.52%) households are not satisfied with the service provided (Table 4.3 below). This is confirmed by a negative but weak correlation (- 0.1948*) between quality and age but highly significant (appendix table 1 below). Also, out of 212 (58.89%) that possessed smart phones 99 (46.7%) are farmers and 113 (53.3%) are in other occupations. The results in appendix table 1 below also confirmed a positive but weaker correlation (0.0458) between access and occupation. This circumstance explained the reason why majority of rural households, most especially farmers, do not have access to financial services.

Table 4.2: Measures of Association: Quality by Access; Quality by Usage; Access by Usage

Quality by Access				Quality by Usage				Access by Usage			
	Access		Total		Usage		Total		Usage		Total
Quality	1	0		Quality	0	1		Access	0	1	
0	115	95	210	0	145	65	210	1	131	81	212
%	54.25	64.19	58.33	%	63.04	50	58.39	%	56.96	62.31	58.89
1	97	53	150	1	85	65	150	0	99	49	148
%	45.75	35.81	41.67	%	36.96	50	41.67	%	43.04	37.69	41.11
Total	212	148	360	Total	230	130	360	Total	230	130	360
%	100	100	100		100	100	100		100	100	100

Source: Author's Compilation (2025)

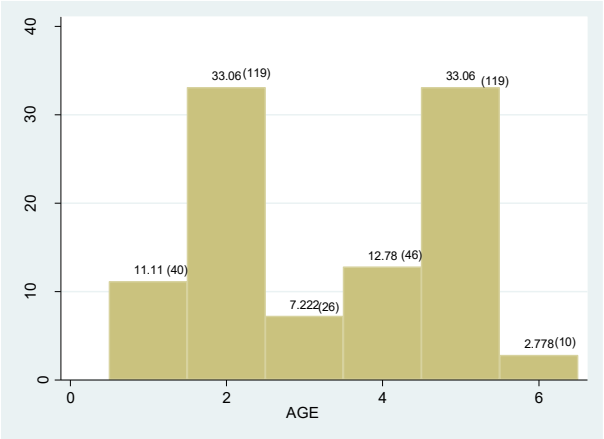

Fig. 4: Age

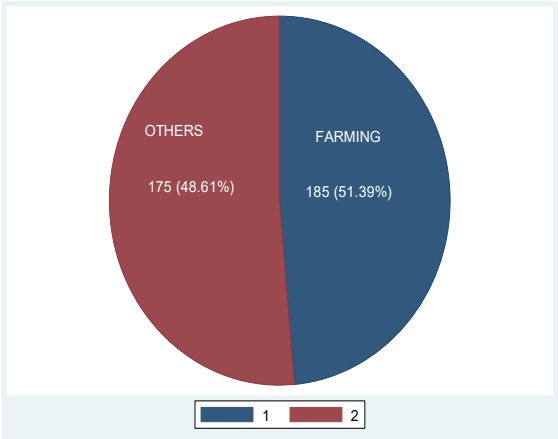

Fig. 5: Occupation

Source: Author's Compilation (2025)

Table 4.3: Measures of Association: Access by Age; Quality by Age; Usage by Age

Access by Age			Quality by Age			Usage by Age		
	Age	Total		Age	Total		Age	Total
Access	26 – 65 years	310	Quality	26-65 years	310	Usage	26 – 65 years	310
1	174	174	1	116	116	0	199	199
%		56.13	%		37.42	%		86.52

Source: Author's Compilation (2025)

Regarding educational qualification, majority of the households (196 (54.44%) have secondary school background with only 50 (13.89%) households have tertiary qualification and the remaining 141 (31.67%) households have primary school certificate (Fig. 6 below). Also, there is a positive weak correlation (0.1103*) between access and education but significant (appendix table 1 below). Hence, the low level of education limits their accessibility to financial services. This is in line with the argument that people who lack literacy find it difficult to manage their finances, get financial services, and comprehend financial goods (Liew, 2020; Morgan and Long, 2020; Chowdhury and Chowdhury, 2023 & Hossain, Ibrahim and Uddin, 2023). The gender inequality is evident in the larger percentage of the households of 215 (59.72%) are male and only 145 (40.28%) are female (Fig. 7). Even their educational background worsens the situation, with only 82 female households having secondary education out of the total of 196 (Table 4.4 below). Also, there is a positive but weaker correlation (0.0602) between education and gender (appendix table 1 below). This is supported by Sarker and Rahman (2025) findings that digital banking transformation bridged the financial gaps but there are problems of lack of infrastructure, digital illiteracy and gender inequalities in Bangladesh.

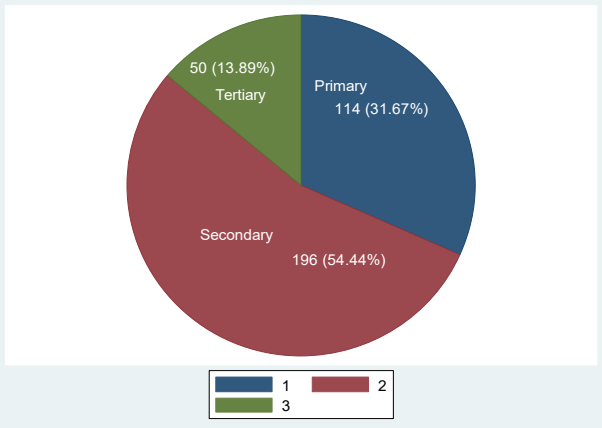

Fig 6: Education

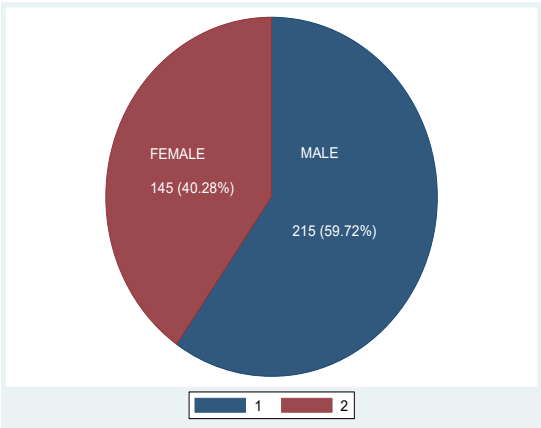

Fig 7: Gender

Source: Author's Compilation (2025)

Table 4.4: Measures of Association: Education and Gender; Cost and Other sources of finance

	Education					Cost
Gender	2	1	3	Total	Other sources finance	1& 2
1	114	73	28	215	1	117 (32.50%)
%	53.02	33.95	13.02	100	4	103 (28.61)
2	82	41	22	145	2	61 (16.94%)
%	56.55	28.28	15.17	100	5	39 (10.56%)
Total	196	114	50	360	3	38 (10.56%)
%	54.44	31.67	13.89	100	6	2 (0.56%)

Source: Author's Compilation (2025)

Also, the study results showed that most of the households are patronizing microfinance banks (117 (32.5%)) and other informal financial institutions (243 (67.5%)) (Fig. 8 below) mainly because of high banks charges (288 (80%)) and multiple fees (72 (20%)) (Fig. 9 below). This is further breakdown in table 4.4 above that 117(32.50%), 103(28.61%), 61(16.94%), 39 (10.56%), 38 (10.56%) and 2 (0.56%) households patronized microfinance banks, savings group/club, money lenders, cooperative society, friends/relatives and rotational credits respectively. This is confirmed by the results in appendix table 1 below that there is a negative weak correlation (-0.1142*) between other sources of finance and cost but significant. This negative relationship shows that people prefer to patronize

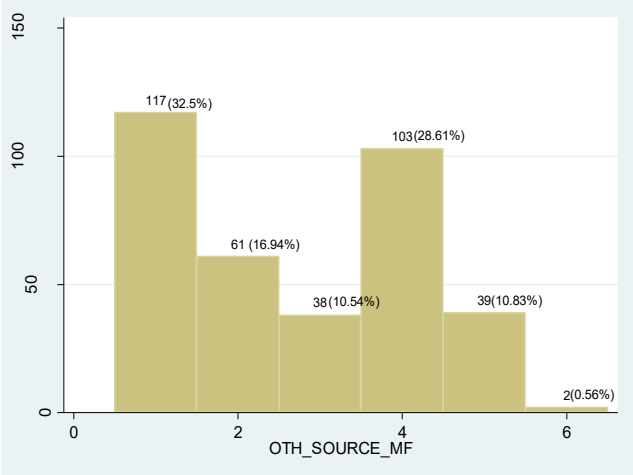

Fig. 8: Other sources of finance
Source: Author's Compilation (2025)

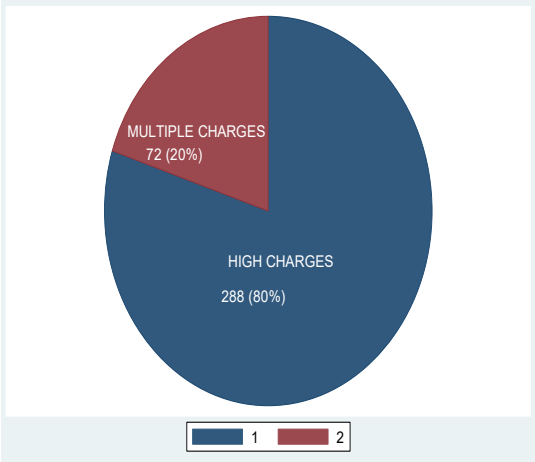

Fig. 9: Bank charges

informal financial institutions than formal banks in the rural areas due to banks high and multiple charges. This is confirmed by Simatele and Maciko (2022) findings that high bank charges are discouraging rural dwellers to patronize formal financial services.

Travelling long distance discouraged many households to patronize banks and majority of the households, 297 (82.50%) travelled up to 50 minutes or more to the nearest banks (Fig. 10 below). Also, the results in appendix table 1 below showed that there is a positive but weaker correlation (0.0204) between access and distance. This is affirmed by Henning-Smith, Evenson, Corbett, Kozhimannil, and Moscovice (2017) study that the need to travel greater distances to the nearest bank is made worse by the lack of good public transportation in many rural areas.

These barriers have restricted the rural communities to be using informal financing and digital banking platforms for their financial transactions. Opay is a popular digital banking platform being used by 235 (65.28%) households and followed by moniepoint of 59 (16.39%) households (Fig. 11 below). The results in table 4.5 below also showed that majority of the households (137 (58.30%)) with smartphones are using Opay and followed by 34 (59%) households using moniepoint. In addition, in table 4.5 below due to travelling long distance to the banks majority of the households (198 (84.5%)) preferred using digital banking Opay and Moniepoint platforms. This is confirmed by Demirgüç-Kunt, Klapper, Singer, Ansar and Hess, (2017) that digital banking platforms removed some of the barriers associated with traditional banking in rural areas. In the same vein, Sarwar, Diepeveen and Moreno (2023) study established that the use of digital financial services in cash transfer has facilitated easy accessibility to financial services by the neglected rural areas. Also, the results in appendix table 1 below showed that there is a positive but weaker correlation (0.0493) between distance and digital financial services. The implication of this is that the longer the

distance to the banks the more of digital financial services that are utilized by the households. This requires urgent action in the improvement of innovative ICT infrastructures, which can facilitate the growth of digital financial services in the rural areas.

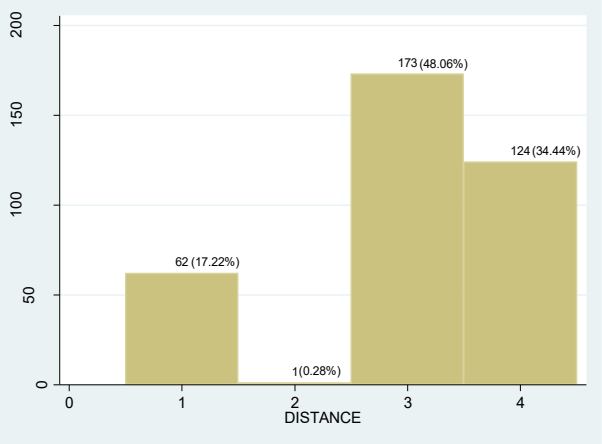

Fig. 10: Distance
Source: Author's Compilation (2025)

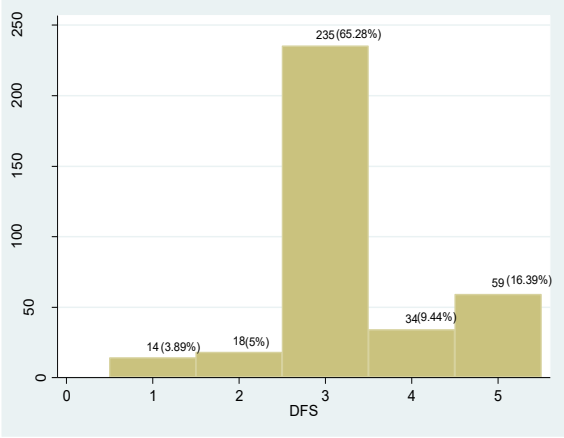

Fig. 11: Digital financial services

Table 4.5: Measures of Association: Digital financial services (DFS) and Access

	Digital financial services (DFS)							Digital financial services (DFS)				
Access	3	5	4	2	1	Total	Distance	3	5	4	2	1
1	137	34	26	8	7	212	3	117	27	22	3	4
%	58.3	57.6	76.5	44.4	50.0	58.9		49.8	45.8	64.7	16.7	28.6
0	98	25	8	10	7	148	4	81	23	8	7	5
%	41.7	42.4	23.5	55.6	50.0	41.1		34.5	39.0	23.5	38.9	35.7
Total	235	59	34	18	14	360	1 &2	37	9	4	8	5
%	100	100	100	100	100	100		15.7	15.2	11.8	44.4	35.7

Source: Author's Compilation (2025)

Figure 12 below showed that 222 (61.67%) households-maintained savings account with microfinance banks and other informal financial institutions because of long distance and high charges while only few of them maintained savings account with formal banks. Also, the results in table 4.6 below showed that out of 212 households that have smart phones only 143 (67.45%) households have savings A/C, out of 150 households that have internet facilities only 85 (56.67%) households have savings A/C and out of 230 households that are not satisfied with the formal banks financial services 128 (55.65%) of them have savings account with informal financial institutions. This is established in the results of table 4.7 below which showed the association of savings A/C and digital financial services (DFS), with majority of the households prefer using Opay155 (69.82%) and moniepoint 40 (18.02%) financial platforms. This is asserted by Mujeri and Azam (2018) & Aziz and Naima (2021) that infrastructure gaps such as unreliable internet connectivity and high smartphone costs limit access in rural areas. Therefore, scaling up innovative ICT infrastructures will facilitate the growth of digital financial services in the rural areas.

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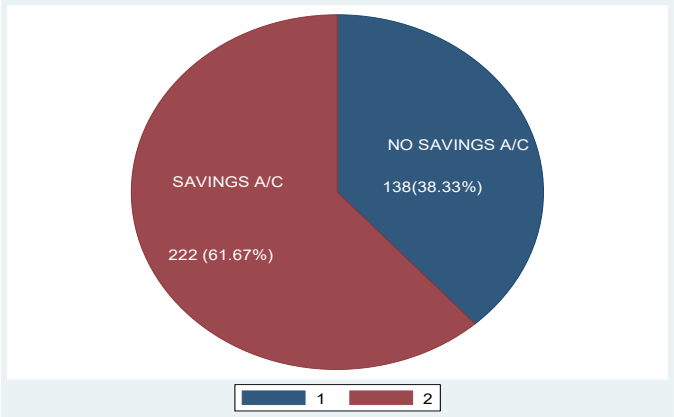

Fig. 12: Savings A/C
Source: Author's Compilation (2025)

Table 4.6: Measures of Association: Access by Savings; Quality by Savings; Usage by Savings

Access by Savings			Quality by Savings			Usage by Savings		
	Savings	Total		Savings	Total		Savings	Total
Access	2 1		Quality	2 1		Usage	2 1	
1	143 69	212	1	85 65	150	0	128 102	230
%	67.45 32.55	100	%	56.67 43.33	100	%	55.65 44.34	100

Source: Author's Compilation (2025)

Table 4.7: Measures of Association: Savings by DFS

	Digital financial services (DFS)				
Savings A/C	3	5	4	2	1
Total					
2	155	40	24	0	3
222					
%	69.82	18.02	10.81	0.00	1.35
100					

Source: Author's Compilation (2025)

4.2 Probit and Tobit Regression Results

The probit and tobit results indicate quality, access and usage as distinct variables that influence the barrier to access financial services by the households in the rural areas. In this study we used 5 percent level of significant to determine the correlations between factors that could affect the probability of accessing financial services by the rural households in Nigeria.

4.2.1 Quality

In the table 4.8 below, the Pseudo-R^2 (0.4124) at 1% significance level indicates that the independent variables included in the probit model explain significant proportion of the variations in financial innovation to drive inclusive financial system in Nigeria. It signifies that those variables in the model explain high level of the probabilities by which rural innovations can transform inclusive financial system. Also, a high p-value of 0.2424 in a Pearson goodness-of-fit indicates that the model fits the data well because it suggests the observed data is not significantly different from the data predicted by the model. Therefore, high p-value of 0.2424, which is greater than the typical significance level of 0.05 means the null hypothesis cannot be rejected, which in this case the model's distribution matches the observed data's distribution. In addition, the correct prediction rate obtained from probit model is 68.61%. This indicates that the probit model predicts 93% of the cases correctly. As for the tobit regression, the scale of 0.961962 is a coefficient that indicates the direction and magnitude of the relationship between the predictor variable and the response variable, and its value of ~0.96 suggests a strong and positive relationship. The p-value of 0.0000, which is actually (<0.0005) indicates a highly statistically significant result. Furthermore, the results in table 4.8 below explained that age and savings of the households are negatively related to quality but significant. The spearman rank correlation coefficient of -0.1948 also confirmed that there is a negative weak correlation between quality and age but highly significant. As for the savings, the coefficient of -0.0869 shows a negative weaker correlation between quality and savings (appendix table 1 below). A negative relationship explained that a 1% increase in age and a 1% increase in savings result in a 0.19% decrease and 0.35% decrease in quality, respectively. This is confirmed by the results of the study survey in Table 1 above that out of 129 (35.84%) households from the age of 56 and above only 29 (19.37%) of them have access to internet facilities (quality) (table 4.9 below). Also, the study survey results

(Table 1) confirmed that out of 222 (61.67%) households that have savings A/C only 85 (38.29%) have access to internet facilities (quality) (Table 4.9). Also, digital financial services (DFS), distance and other source of microfinance (OTH_SOURCE_MF) are positively related to quality. These indicate that a 1% increase in digital financial services, a 1% increase in distance and a 1% increase in other source of micro finance leads to 0.14% increase, 0.18% increase and 0.13% increase in quality, respectively. This is confirmed by the spearman rank correlation coefficients of 0.1056*, 0.1616* and 0.1152*, which showed that digital financial services, distance and other source of micro finance have positive but weak correlation with quality respectively and they are significant (appendix table 1 below). This is established by Demirgüç-Kunt, Klapper, Singer, Ansar and Hess, (2017) that digital banking platforms removed some of the barriers associated with traditional banking in rural areas. In the same vein, Sarwar, Diepeveen and Moreno (2023) study affirmed that the use of digital financial services in cash transfer has facilitated easy accessibility to financial services by the neglected rural areas. In addition, we applied tobit regression estimation technique for the robustness of the results in order to make sure that the results of probit regression are not biased by the truncation of the study explained variables. In the Table 4.8 it is perceived that in terms of signs and level of significance the coefficients of the explanatory variables under probit and tobit are the same except cost, which is an additional variable from tobit and significant. The results showed that a1% increase in cost result to a 0.25% increase in internet facilities (quality). The implication of this is that high or multiple cost discourages people to patronize banks and shift their loyalty to digital banking services, which motivate the providers in improving the quality of the services, most especially in the upgrading of internet facilities. This is confirmed by Simatele and Maciko (2022) that high bank charges are discouraging rural dwellers to patronize formal financial services. However, introduction of technology has cut down the charges on digital banking service, making it easier and cheaper in the provision of financial services to the rural dwellers (Simatele, Dube and Khumalo, 2021). Also, digital technologies are facilitating access to financial services and represent complement or alternative to traditional financial arrangements, which could not provide access point to the financially excluded group. Therefore, the policy implication is to make adequate provision for ICT infrastructure to drive digital banking services in rural areas.

Table 4.8: Probit and Tobit Regression Results for Quality

	Probit			Tobit		
Variable	Coefficient	Std. Error	Prob.	Coefficient	Std. Error	Prob.
AGE	-0.185188*	0.047304	0.0001	-0.155608*	0.040074	0.0001
COST	0.288904	0.175986	0.1007	0.250651***	0.147372	0.0890
DFS	0.141032***	0.076895	0.0666	0.108871***	0.063596	0.0869
DISTANCE	0.184473**	0.075005	0.0139	0.158042**	0.064885	0.0149
EDU_HH	-0.173434	0.117770	0.1408	-0.145333	0.100576	0.1485
GEND_HH	0.214966	0.145485	0.1395	0.169333	0.121900	0.1648
HH_OCCUP	-0.170744	0.150896	0.2578	-0.142642	0.128672	0.2676
INCOME_HH	-0.004587	0.044842	0.9185	-0.002278	0.038169	0.9524
OTH_SOURCE_MF	0.134262**	0.054532	0.0138	0.094683**	0.044524	0.0335
SAVINGS_HH	-0.354233**	0.156183	0.0233	-0.290593**	0.130396	0.0258
C	-0.479792	0.537453	0.3720	-0.237280	0.463614	0.6088
Pseudo-R^2 Pearson Classification Prediction	0.4124; p-value (0.0000) Chi-square = 327; p-value = 0.2424 68.61%			Scale 0.961962		0.0000

Source: Author's Compilation (2025)

Table 4.9: Measures of Association: Quality by Age; Savings by Quality

AGE							Quality			
Quality	2	5	4	1	3	6	Savings	0	1	Total
1	44	22	32	27	18	7	2	137	85	222
150										
%	29.33	14.67	21.33	18.0	12.0	4.7	%	61.71	38.29	100
100										

Source: Author's Compilation (2025)

4.2.2 Access

In the Table 4.10, the Pseudo R^2 (0.4457) at 5% significance level, which explained high value of variation indicating a better fit. Also, the Pearson goodness-of-fit test with p-value of 0.2956, which is greater than the typical significance level of 0.05 suggests that there is enough evidence to support that the model provides a good fit to the data. In addition, the correct prediction rate obtained from probit model is 62.78%. This indicates that the probit model predicts 60.56% of the cases correctly. As for the tobit regression, the scale of 0.760686 is a coefficient that indicates the direction and magnitude of the relationship between the predictor variable and the response variable, and its value of ~0.96 suggests a strong and positive relationship. The p-value of 0.0000, which is actually (<0.0005) indicates a highly statistically significant result. The results in table 4.10 below further indicate that the cost is negatively related to access but highly significant. This negative relationship indicates that a 1% increase in cost result to a 0.51% decrease in access. This is confirmed by Simatele and Maciko (2022) that high bank charges are discouraging rural dwellers to patronize formal financial services. Also, both gender and savings have positive and significant relationship with access, a 1% increase in gender and a 1% in savings leads to a 0.26% increase and a 0.27% increase in access, respectively. The results in appendix table 1 below also confirmed that there is a positive but weaker correlation (0.0876) between gender and access and for savings it is a positive weak correlation (0.1424*) but highly significant.

4.10: Probit and Tobit Regression Results for Access

	Probit			Tobit		
Variable	Coefficient	Std. Error	Prob.	Coefficient	Std. Error	Prob.
AGE	-0.027653	0.046223	0.5497	-0.015218	0.028696	0.5959
COST	-0.508860*	0.173949	0.0034	-0.352417*	0.115176	0.0022
DFS	0.022952	0.076760	0.7649	0.016468	0.048604	0.7347
DISTANCE	-0.011611	0.074389	0.8760	-0.008699	0.046684	0.8522
EDU_HH	0.141381	0.117092	0.2273	0.082273	0.072977	0.2596
GEND_HH	0.261736***	0.142894	0.0670	0.163836***	0.089038	0.0658
HH_OCCUP	-0.006628	0.149472	0.9646	-0.009746	0.092659	0.9162
INCOME_HH	0.036937	0.044914	0.4109	0.022465	0.027872	0.4202
OTH_SOURCE_MF	-0.030476	0.053468	0.5687	-0.016591	0.033142	0.6167
SAVINGS_HH	0.266163***	0.151885	0.0797	0.167141***	0.097542	0.0866
C	-0.158172	0.530399	0.7655	0.178608	0.340916	0.6003
Pseudo-R^2	0.4457; p-value (0.0167)					
Pearson	Chi-square = 322.88; p-value =					
Classification	0.2956 60.56%			Scale		
Prediction				0.760686		0.0000

Source: Author's Compilation (2025)

4.2.3 Usage

In the Table 4.8, the Pseudo-R^2 (0.3462) at 5% level of significant indicates overall satisfaction variability values for the model. It represents that those variables placed in the model explain high level of the probabilities by which rural innovations can transform inclusive financial system. Also, the Pearson goodness-of-fit test with a high p-value of 0.1607, which is greater than the typical significance level of 0.05 suggests that the observed data is consistent with the distribution predicted by the model. In addition, the correct prediction rate obtained from probit model is 62.78%. This indicates that the probit model predicts 62.78% of the cases correctly. As for the tobit regression, the scale of 1.095224, which is a coefficient that indicates the direction and magnitude of the relationship between the predictor variable and the response variable, and its value of ~1.10 suggests that there is a strong and positive relationship among the variables. The p-value of 0.0000, which is actually (<0.0005) indicates a highly statistically significant result. Furthermore, the coefficients of age and savings have positive relationship with usage and significant. The results indicate that a 1% increase in age and a 1% increase in savings result to a 0.09% increase and a 0.36% increase in access, respectively. This is confirmed by the results in appendix table 1 below that there is a positive correlation (0.1218*) between age and usage and significant, also there is a positive correlation (0.1645*) between savings and usage and highly significant.

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Table 4.11: Probit and Tobit Regression Results for Usage

	Probit			Tobit		
Variable	Coefficient	Std. Error	Prob.	Coefficient	Std. Error	Prob.
AGE	0.087842***	0.046106	0.0568	0.089145***	0.046013	0.0527
COST	-0.000378	0.179820	0.9983	0.017650	0.181097	0.9224
DFS	-0.051973	0.079534	0.5135	-0.047580	0.080275	0.5534
DISTANCE	0.081967	0.077850	0.2924	0.091126	0.078805	0.2475
EDU_HH	0.002389	0.117162	0.9837	0.010503	0.114963	0.9272
GEND_HH	-0.042189	0.142755	0.7676	-0.031401	0.141208	0.8240
HH_OCCUP	0.163295	0.149157	0.2736	0.162134	0.147786	0.2726
INCOME_HH	-0.026813	0.045078	0.5520	-0.025397	0.044766	0.5705
OTH_SOURCE_MF	0.028704	0.053970	0.5948	0.025825	0.053940	0.6321
SAVINGS_HH	0.364761**	0.156795	0.0200	0.366373**	0.158200	0.0206
C	-1.531827	0.576702	0.0079	-1.545795	0.598988	0.0099
Pseudo-R^2 Pearson Classification Prediction	0.3462; p-value (0.0390) Chi-square = 334.65; p-value = 0.1607 62.78%			Scale 1.095224		0.0000

Source: Author's Compilation (2025)

From the three regression results above, it is observed that savings A/C has a consistent positive and significant relationship with the access, quality and usage. Therefore, informal financial institutions savings accounts can be encouraged through high mobile phone penetration, which can accelerate growth in electronic transactions. This can be done by providing ICT infrastructure that can aid digital banking services in rural areas.

Conclusion

Given the large number of rural dwellers unable to access financial services due to constraints like inadequate internet connectivity and technological infrastructure, government and stakeholders should support rural MFIs by enabling them to channel resources to service those in need. Scaling up rural micro finance through digital banking offers a significant opportunity, as evidence suggests it can help millions of rural dwellers escape poverty. However, this requires prior investment in digital infrastructure (like mobile networks and internet) and financial literacy programmes to ensure users can understand and utilize digital tools effectively. Using probit regression method of analysis the study found that a 1% increase in age and a 1% increase in savings A/C results in a 0.19% decrease and a 0.35% decrease in quality, respectively. Also, a 1% increase in digital financial services, a 1% increase in distance and a 1% increase in other source of micro finance results to a 0.14% increase, a 0.18% increase and a 0.13% increase in quality, respectively. For robustness of the study, tobit regression method was used and cost was identified as additional variable, which showed that a 1% increase in cost leads to a 0.25% increase in internet facilities (quality). This has a unique policy implication for both the government and stakeholders. The probit regression carried out on access showed that a 1% increase in cost leads to a 0.51% decrease in access. Also, a 1% increase in gender and a 1% increase in savings A/C result to a 0.26% increase and a 0.27% increase in access, respectively. Using probit regression on usage the results indicate that a 1% increase in age and 1% increase in savings A/C leads to a 0.09% increase and a 0.36% increase in access, respectively. Therefore, it is pertinent for financial service providers to explore creative technological methods for delivering services that meet local needs and address service gaps in the rural areas.

Recommendations

In order to ensure that the rural poor are well targeted, the following recommendations are made:

The Central Bank of Nigeria should create a comprehensive regulatory framework for digital banking, which focuses on existing community resources and potentials to stimulate rural financial innovations for a transformative and inclusive financial system.

The providers of financial services should be mandated to introduce new technology which can reduce the charges, making it easier and cheaper in the provision of financial services to the rural dwellers.

Users of digital financial services should be encouraged to have knowledge and understanding of comprehensive digital financial literacy, their utilization, and effective financial management.

There is need to designing financial sustainable models that can increase outreach and scale up operations for the

poor in terms of increasing the provision of ICT infrastructure that can aid digital banking services in rural areas.

Proper incentives must be put in place to encourage the establishment of additional digital service providers in the rural areas.

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Appendix

Table: Spearman rank correlation

	QUALITY	ACCESS	USAGE	AGE	EDU_H	GEND_H	H_OCCUP	INCOME~H	OTH_SO~F	COST	DISTANCE	DFS	SAVING~H
QUALITY	1.0000												
ACCESS	0.0992	1.0000											
	0.0600												
USAGE	0.1271*	0.0522	1.0000										
	0.0158	0.3230											
AGE	- 0.1948*	0.0381	0.1218*	1.0000									
	0.0002	0.4706	0.0208										
EDU_HH	-0.1175*	0.1103*	0.0682	0.0777	1.0000								
	0.0257	0.0364	0.1967	0.1411									
GEND_HH	0.0527	0.0876	0.0075	0.1336*	0.0602	1.0000							
	0.3191	0.0970	0.8867	0.0112	0.2544								
HH_OCCUP	-0.0799	0.0458	0.0948	0.0353	0.4146*	0.0168	1.0000						
	0.1305	0.3862	0.0724	0.5040	0.0000	0.7502							
INCOME_HH	0.0181	-0.0027	-0.0464	-0.0490	-0.0910	-0.1087*	-0.0131	1.0000					
	0.7322	0.9588	0.3805	0.3537	0.0846	0.0392	0.8050						
OTH_SOURCE~F	0.1152*	0.0056	0.1067*	0.2133*	0.1094*	0.0095	0.1669*	0.0228	1.0000				
	0.0288	0.9154	0.0430	0.0000	0.0379	0.8571	0.0015	0.6669					
COST	0.0845	-0.1750*	-0.0434	0.0051	-0.1290*	0.0850	-0.0695	0.0145	-0.1142*	1.0000			
	0.1094	0.0009	0.4119	0.9236	0.0143	0.1076	0.1885	0.7833	0.0302				
DISTANCE	0.1616*	0.0204	0.0713	-0.1570*	0.0776	0.0023	0.0836	0.0086	0.3135*	-0.1097*	1.0000		
	0.0021	0.6991	0.1769	0.0028	0.1420	0.9655	0.1131	0.8704	0.0000	0.0375			
DFS	0.1056*	0.0754	0.0281	-0.0230	0.1230*	0.1070*	0.0646	-0.1264*	0.1791*	-0.1061*	0.0493	1.0000	
	0.0453	0.1531	0.5946	0.6637	0.0196	0.0424	0.2216	0.0164	0.0006	0.0443	0.3513		
SAVINGS_HH	-0.0869	0.1424*	0.1645*	0.0571	0.2679*	0.0883	0.1705*	-0.0907	0.2205*	-0.1914*	0.2209*	0.2124*	1.0000
	0.0997	0.0068	0.0017	0.2798	0.0000	0.0942	0.0012	0.0856	0.0000	0.0003	0.0000	0.0000	