ASSESSMENT OF FINANCIAL TECHNOLOGIES AND INCLUSION IN SELECTED RURAL AREAS IN SOUTHWESTERN NIGERIA

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ABSTRACT

This study examined the financial technologies adopted by rural dwellers in selected local governments in Southwestern Nigeria and the types of financial services they have access to. This was with a view to provide information to develop policy strategies to improve wholesome financial inclusion in rural Nigeria. The study was conducted in the Local Government Area (LGA) with the lowest population selected from Ogun, Oyo, Ondo and Ekiti States. Data was collected using a questionnaire administered on 250 rural dwellers. Data was analysed using descriptive methods. The results revealed that 43.5, 98, 100 and 97% of the respondents adopted Mobile Apps, Automated Teller Machines, Point-of-sale machines and USSD respectively. The low adoption of Mobile Apps was attributed to the low ownership of Smart Phones among respondents. While Mobile Apps provided access to account opening, payment, savings and credit services, the others merely provided access to money transfer services. The study concluded that while existing FinTech solutions have improved financial inclusion, critical financial services such as credit access, insurance, and account opening remain underutilized, thus, limiting their potential to foster broader financial growth. The study recommended public action to address low smartphone penetration, enhance FinTech capabilities, promote multi-service FinTech platforms and encourage support for digital inclusion.

Keywords: FinTech; Financial inclusion; Financial Services; Rural dwellers; Nigeria

DOI 10.51459/jostir.2025.1.2.0145

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History
Received: 8/07/2025
Accepted: 06/10/2025
Published: 10/11/2025

1 | Introduction

Financial inclusion is a critical component of economic development, enabling individuals and businesses to access financial service that facilities economic growth improve living standards and reduce poverty. According to a 2016 research by the Bill and Melinda Gate's Foundation, banks continue to be the main force behind financial inclusion in Nigeria. Only 35% of Nigerians became financially included in 2015, according to the study, 42% of adult Nigerians were able to have access to any monetary service while only nine out of ten people with bank accounts used them frequently. However, the use of modern financial services in Nigeria has grown exponentially over time. According to available data, a2f.ng reports that financial inclusion reached 64% of the country's adult population had bank accounts by 2023 (EFinA, 2024).

Nigeria's National Financial Integration Strategy was created and

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JOURNAL OF SCIENCE, TECHNOLOGY AND INNOVATION RESEARCH
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implemented by the Central Bank of Nigeria (CBN) with an effort towards increasing financial inclusion (FI) throughout the country. This five-year strategy (2019-2024) aimed to reach a 95% financial inclusion rate by 2024. The strategy's fundamental directive is for the banking industry to reorganize and refocus initiatives, policies, and programs in order to hasten the delivery of financial integration efforts and put a greater priority on women, rural populations, young adults and micro-, small- and medium-sized enterprises.

According to World Bank (2018), telecoms-based mobile money financial technologies have provided underserved Africans with access to financial services. Kenya has a telecoms-based mobile money penetration rate of over 60%, while Ghana has a service penetration rate of over 40%. This contrasts with Nigeria, where only 17% of the populace used mobile money in 2023 (Statista, 2023). Financial inclusion, according to Ahamed & Mallick (2019), encompasses more than just owing a bank account. It also encompasses additional services of value that act as a motivator for the excluded to participate in the official financial system (Kama & Adigun, 2013). Financial inclusion, according to the World Bank Group, is the access by individuals and organizations to monetary services that are reasonable, sustainable and satisfy the financial requirements of users with respect to trade, payment, savings, credit, and insurance (Sahay *et al*., 2015, World Bank, 2018). This brings up concerns about the types of financial technologies that provide financial services to the underserved, what influences the adoption of the technologies and what the technologies are used for.

Several deposit money banks have implemented financial technologies to further the CBN's objectives to raise the rate of financial integration in the Nation. These technologies include among others, third-party payment apps, mobile banking, Unstructured Supplementary Services Data (USSD), and mobile banking apps. Information on the uses and factors influencing the adoption of financial technologies become imperative for policy strategies to improve wholesome financial inclusion in the country. In the absence of this information, this study will therefore provide information on the types and roles of financial technologies deployed by deposit money banks to improve financial integration and the level and extent of their adoption in rural Nigeria. The outcome of this research provides valuable information to development practitioners and financial services providers on how to increase financial inclusion in not only Nigeria but also in countries with similar economic indices and lower adoption rates of mobile money.

2 | Literature Review

2.1 | Theoretical Framework: Overview of Diffusion of Innovations Theory

The Diffusion of Innovations Theory, created by Everett Rogers in 1962, offers a complete framework for comprehending the dissemination of innovative ideas, behaviours, and products within a social system. Rogers (2003) reported that the adoption process consists of a sequence of steps that individuals and organisations may undertake before adopting an innovation. The steps are as follows: awareness, interest, evaluation, trial, and adoption. This model is adopted for this study because it provides a structured understanding of how innovations spread. It also helps identify determinants and barriers at each stage, allowing for targeted interventions to facilitate adoption. For example, strategies targeted at prospective adopters at the interest stage may include providing free samples or try out the innovation, while performance data may be provided for people at the evaluation stage to encourage the adoption of the technology. Recent studies confirm the distinctiveness and relevance of each stage,

including in digital, educational, and consumer innovation settings (Sai, 2018; Menzil *et al*., 2022). This theory has been adapted to account for new communication dynamics, such as the role of social media influencers and digital platforms, which can alter the sequence or emphasis of stages (Sai, 2018; Oulhi, 2024; Memedovich *et al*., 2025). This section investigates these stages.

a) Awareness stage

The initial phase of Rogers' adoption process is characterised by the individual being aware of a certain concept or idea. At this stage, individuals or organisations are introduced to an innovation but do not possess comprehensive information about it. Being aware is essential because it establishes the basis for the subsequent phases of the adoption process. Research has demonstrated that mass media, social networks, opinion leaders, social influencers and early adopters have substantial influence in raising knowledge of new technologies (Valente, 1996, Hornik, 2002, Yorke, 2015, Oulhi, 2024).

b) Interest stage

After individuals become aware of an innovation, the subsequent stage is developing an interest towards it. Interest is shaped by perceived benefits, social influence, and exposure to credible sources (Khan, 2017). At this stage, individuals actively pursue additional information and develop a heightened sense of curiosity over the functionality and possible advantages of the innovation. Interest is marked by proactive knowledge acquisition, which may include reading articles, attending presentations, or engaging in discussions about the invention with peers (Rogers, 2003, Venkatesh and Bala, 2008, Sai, 2018).

c) Evaluation stage

During the evaluation phase, individuals or organisations analyse the invention to determine its appropriateness for their particular requirements and circumstances. During this phase, individuals engage in a cognitive evaluation in which they assess the advantages and disadvantages of adoption, taking into account aspects such as compatibility, complexity, and prospective results (Davis, 1989, Karahanna et al., 1999, Rogers, 2003). However, recent research now shows that evaluation now often precedes interest, especially in digital/influencer contexts (Khan, 2017; Oulhi, 2024)

d) Trial stage

The trial stage entails the practical execution of the innovation on a restricted scale to evaluate its feasibility and advantages. This stage is critical as it enables prospective adopters to test the innovation without fully committing to its adoption. In addition, trialability is crucial for adoption, especially in technological innovation settings (Menzil *et al*., 2022). The experiment can mitigate ambiguity and foster assurance in the worth of the innovation (Rogers, 2003). Product sample and pilot programmes are frequently employed in consumer markets to facilitate the initial trial phase. Software businesses frequently provide free trials or beta versions to enable users to evaluate the product before making a purchase (Gefen *et al.*, 2003).

e) Adoption stage

The ultimate phase in Rogers' paradigm is adoption, wherein the individual or organisation makes the deliberate choice to completely incorporate the innovation into their operations. The adoption of an innovation is determined by the results of the testing phase and the general perception of the benefits of the invention compared to its costs (Rogers, 2003). When an invention is successfully adopted, it might become a routine component of the adopter's operations; a process known as routinization. Studies have

demonstrated that providing ongoing assistance and promoting constant innovation are crucial for maintaining the use of a product or service and preventing its discontinuation (Fichman, 2000, Al-Adwan *et al.*, 2013). Adoption of technological innovations is usually reinforced by positive trial experiences and visible benefits (Menzil *et al.*, 2022)

Rogers' stages of adoption, which include awareness, interest, evaluation, trial, and adoption, offer a comprehensive framework for comprehending the intricate process by which innovations are embraced. Gaining insight into these stages and the variables that impact them can assist politicians, marketers, and innovators in formulating more efficient approaches to encourage the acceptance of novel concepts and technology. Policymakers may use this model to design policy mechanisms to promote innovation uptake and tailor strategies to the needs of different adopter categories (Memedovich *et al.*, 2025).

3 | Materials and Methods

The study covered rural dwellers in four states namely; Ogun, Oyo, Ondo and Ekiti States in Southwestern Nigeria. Multistage sampling technique was used to select the rural dwellers for this study. The first stage entailed the purposive selection of four States with highest level of head count per-capital poverty rate in the region. Available information shows that these States include Ondo, Oyo, Ogun and Ekiti with 25.54, 31.09, 29.7 and 27.10% level of per-capita poverty measures respectively (NBS, 2019; Awoyemi *et al.,* 2024). At the second stage, one local government area (LGAs) was purposively selected from each state. These LGAs were selected based on the lowest population per Local Government Area (NPC, 2006; Awoyemi *et al.*, 2024). It is expected that local governments with the lower populations will have more people living at the bottom of the economic pyramid. These are; Imeko Afon LGA with total population of 82,952 in Ogun State; Akoko South East LGA with 82,443 in Ondo State and Ibarapa North LGA in Oyo State with a population of 100,293 were selected (National Population Commission of Nigeria, 2006, National Bureau of Statistics, 2011). At the third stage of the selection process, rural towns were identified purposively from each local government areas. The fourth stage entailed the purposive selection of persons of working age from the LGAs. A total of 250 rural dwellers were administered with a copy of questionnaire. This was distributed proportionately among the LGAs by population. Seventy eight in Imeko Afon LGA, another 78 in Akoko South East LGA and 94 in Ibarapa North LGA were targeted as respondents in each LGA.

The study's data were derived from primary and secondary sources. Primary data were collected through the use of one set of questionnaire and interviews. The questionnaire was administered on the individual rural dwellers. The rural residents were given a set of questionnaire by hand, and in certain situations, it was interpreted to those who could not read. Information collected from the rural dwellers includes socio-demographics, ownership of telecommunications device and type of bank accounts held. The specific FinTechs the rural dwellers used to access financial services were also elicited by the questionnaire. This includes; Mobile apps, Unstructured Supplementary Services Data (USSD), Mobile banking, Third-party payment apps, Point of Sales (POS) and Automatic Teller system (ATM), Respondents were also given the opportunity to mention others not listed. Respondents were asked to indicate on a 5-point scale (from Aware = 1; interested = 2; evaluating use = 3; trial = 4; Adopted = 5) the level of adoption of the

technologies and their roles in opening accounts, making payment, saving, paying staff, insurance, receiving monies, checking balances and obtaining credit among others. Data was analysed using descriptive statistics

4 | Results and Discussion

Two hundred and fifty copies of the questionnaire were distributed and two hundred copies were retrieved. This implies a total retrieval rate of 80%. The results of the socio-economic/demographic characteristics of the rural dwellers are shown in Table 1. The distribution of the respondents by gender as shown in the table depicts that majority (57%) of the respondents were female while 43% were male. This may not be unconnected with the endemic migration of the male head of the household to urban areas in search of better living conditions for the family. A fewer number of males living in rural areas in Nigeria was also affirmed in earlier findings (Ogundipe *et al*., 2019; Rufai *et al*., 2019). The results also revealed that 46.5% of the respondents in the study area were within 36 to 45 years of age. This means that most rural dwellers in the study area are still in their active productive ages. These demographics imply economically active individuals who are likely to need financial services.

About 19% of the rural dwellers are not financially inclusive, while 71.5% of them have a savings account with one bank or the other. Given the prior conversation, when it was shown that the majority

Table 1 | Socio-economic Characteristics of the Respondents

S/N	Characteristics	(F)%
Age	Under 16	-
	16 – 25	(26) 13
	26 – 35	(41) 20.5
	36 – 45	(93) 46.5
	46 – 55	(20) 10
	> 55	(20) 10
Gender	Male	(80) 43
	Female	(114)57
Smart Phone Ownership	Yes	(87) 43.5
	No	(113) 56.5
Types of accounts held	**Types of accounts held**	
	Savings	(143) 71.5
	Current	(20) 10
	Domiciliary	-
	Joint	-
	Thrift	(32) 18.5

of respondents did not own smartphones and that 10% did not have any kind of formal education, this is not surprising. This result is in agreement with Demirgüç-Kunt, *et al*. (2018) where it was reported that there are still many Nigerians that are financially excluded. They do not have bank accounts and are limited in their financial transactions. Further findings from their study demonstrated that banks may not have been successful in physically presenting themselves to residents of rural areas through bank branches and ATMs (Demirgüç-Kunt, *et al.*, 2018).

4.2 | Types and Roles of Financial Technologies Deployed by Deposit Money Banks to Improve Financial Inclusion in Rural Areas

The types of financial technologies deployed to improve financial inclusion in the study area are shown in Table 2. About 41% of the respondents indicated that they used mobile apps for making payments while 41.3% reported they used the technology for receiving payments. About 42.5% of the respondents revealed that they used it for checking their bank balances. The results also revealed that 17.4% of the respondents used the financial technology for saving, obtaining credit and paying salaries. This indicates a low function utilization of mobile apps in this regard. This may not be unconnected with the low ownership of smart phones which are crucial to the utilization of mobile apps. With regards to USSD, 98% revealed that they used the technology for making payments while another 98% used it for checking account balances. None of the respondents reported that the technology was used for opening accounts, saving money, mobile banking, receiving payments and obtaining credit.

Table 2 | Types and Functions of Financial Technologies Deployed to Improve Financial Inclusion in Rural Southwestern Nigeria

Financial Technology	AO	MP	SA	RP	CB	OC
	F (%)	F (%)	F (%)	F (%)	F (%)	F (%)
Mobile Apps	35 (17.5)	83 (41.3)	35 (17.4)	83 (41.3)	85 (42.5)	46 (23.0)
USSD	196 (98)	-	-	-	196 (98)	-
POS	-	200 (100)	196 (98)	192 (96)	194 (97)	-
ATM	-	194 (97)	-	-	194 (97)	-

Key: AO= Account Opening, MP= Making Payment, SA=Savings, RP= Receiving Payment, OC= Obtaining Credit.

Functions and roles of POS in the study area revealed that all (100%) the respondents were shown to use the technology for making payments, 98% used it for savings, 95% deployed it for mobile banking, while 96 and 97% used the technology for receiving payments and checking account balances respectively. It was also shown that the POS is not used for account opening and obtaining credit. The ATMs in the study area are used majorly by 97% of the respondents for making payments and by 98% for checking account balances. It was also shown that mobile banking and savings have low usage among the respondents as 45 and 5% respectively used the technology for the aforementioned purposes. None of the respondents indicated using the technology for opening accounts, obtaining credit, and receiving payments. These results clearly showed that making payment and checking account balances are the most common uses of the financial technologies in the study area. This may not be unconnected with the perception of the respondents on the ease of use of the technologies and their basic financial transactions routines of paying and receiving payments. In addition, the availability of PoS machines and ATMs seem to be the major factor of the use of these FinTechs

4.3 | Extent and Level of Adoption of the Financial Technologies by Rural Dwellers

Table 3 shows the level of adoption of these technologies in the study area. Nineteen percent of

the respondents are at the awareness stage of Mobile apps while 37.5% were interested in trying out the technology but however were not in possession of smart phones. About 44% of the respondents have adopted the technology. These results show that Mobile app technology is being utilized in the study area to facilitate financial inclusion. USSD technology has been majorly adopted by 98% of the respondents in the study area, while respondents are at the 3 and 97% of the interest and adoption stages respectively of ATM technology. All the respondents had adopted PoS technology. This is indicative of a high level of adoption and acceptance of POS and ATM technologies as a means of financial transaction and inclusion in the study area.

Table 3 | Level of Adoption of the Financial Technologies

Financial Technologies F (%) Aware	Interest	Evaluation	Trial	Adoption
Mobile Apps	38 (19.0)	75 (37.5)	-	-	87 (43.5)
USSD	-	4 (2)	-	-	196 (98.0)
POS	-	-	-	-	200 (100)
ATM	-	6 (3)	-	-	194 (97.0)

5 | Summary and Conclusion

The study aimed to examine the level of FinTech adoption and the roles these technologies play in providing the full spectrum of financial services, including account opening, trade, payments, savings, credit, and insurance. Findings revealed that only mobile apps offered the broadest range of financial services, covering account opening, payments, and credit. However, mobile app adoption remained low, primarily due to limited smartphone ownership. In contrast, USSD, PoS, and ATM technologies saw widespread adoption, enhancing financial inclusion but their functionality was restricted to money transfers. In addition, ATM and PoS technologies were used all the time by adopters; USSD was used occasionally while Mobile Apps were used almost every time by adopters. The study concludes that while existing FinTech solutions have improved financial inclusion, the predominant technologies adopted (USSD, PoS, ATM) only facilitate money transfers. Other critical services such as credit access, insurance, and account opening remain underutilized, limiting their potential to foster broader financial growth.

6 | Recommendations

a) Expand Mobile App accessibility – Address low smartphone penetration to increase adoption of mobile-based FinTech solutions, which offer a wider range of services (e.g., credit, account opening).

b) Enhance USSD/PoS/ATM Capabilities – Money deposit banks may upgrade existing USSD, PoS, and ATM infrastructure to support additional financial services beyond money transfers.

c) Promote Multi-service FinTech Platforms – Encourage the money deposit banks to integrate more services (e.g., insurance, savings, credit) into widely adopted channels such as USSD.

d) Policy support for digital inclusion – Governments and stakeholders should invest in affordable smart devices and digital literacy to bridge the adoption gap for advanced FinTech solutions

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