



Digital financial services and rural market access in Northwestern Nigeria: evaluating the economic impacts of fintech inclusion

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Received 1 Jun 2025; Accepted 9 Jul 2025; Published 22 Jul 2025

DOI: <https://doi.org/10.64171/JSRD.4.3.47-53>

Abstract

This study examines the economic effects of digital financial services on rural market accessibility in Northwestern Nigeria. As mobile banking, point-of-sale (POS) systems, and other fintech solutions grow, rural areas are becoming more connected to the formal financial system. The research uses secondary data from the Central Bank of Nigeria, EFInA, and the National Bureau of Statistics to look at developments in trade, credit availability, and financial inclusion in rural parts of states including Kano, Sokoto, and Kebbi. The results show that fintech has improved local trade and made it easier for people to get money, yet problems like bad digital infrastructure and low digital literacy still exist. The paper provides policy suggestions to enhance fintech accessibility and optimise its economic advantages for rural communities.

Keywords: Fintech, Rural economy, Financial inclusion, Market access, Northwestern Nigeria

Introduction

It is commonly acknowledged that having access to financing is essential for promoting social inclusion, poverty alleviation, and economic growth. In emerging countries, especially in Sub-Saharan Africa, rural populations have been excluded from formal financial institutions for a long time because of structural, geographic, and institutional hurdles (Demirgüç-Kunt et al., 2022) [8]. Digital financial services (DFS) have become a revolutionary tool to close this gap over the past ten years. They offer new and easy-to-use platforms for saving, borrowing, and making payments, especially in places where traditional banking infrastructure hasn't been very helpful. The development of mobile money, point-of-sale (POS) terminals, digital loans, and fintech-driven savings platforms has changed the way people, especially those who live far away, use financial institutions (Jack & Suri, 2016) [13].

It is especially critical that inclusive financial systems be established in Nigeria. Despite being the largest economy in Africa, Nigeria continues to battle with considerable discrepancies in financial access across regions, socio-economic groups, and gender lines. According to Enhancing Financial Innovation and Access (EFInA, 2023) [9], around 36% of the adult population in Nigeria remains financially excluded, with exclusion rates topping 50% in many rural northern states. Factors such as insufficient infrastructure, low literacy levels, gender inequality, religious conservatism, and limited formal employment aggravate the problem of integrating rural communities into the official economy (CBN, 2023; Adebayo & Bature, 2020) [7, 1].

In Northwestern Nigeria, the situation is very worrisome. The nation's least banked states are Zamfara, Kebbi, Katsina, Sokoto, and portions of Kaduna and Jigawa. These states have few physical bank offices, inadequate road systems, and low rates of mobile internet usage (EFInA, 2023) [9]. Additionally, ongoing insecurity and poverty have hindered economic growth in the region. However, the spread of DFS, notably through agent banking and mobile wallets, is beginning to change rural financial landscapes. Digital platforms are being used more and more by microenterprises, market women, and smallholder farmers to deal, get paid, and obtain microcredit (PWC, 2022) [16]. This digital transformation is also backed by government and business sector initiatives such as the CBN's Financial Inclusion Strategy and the growth of fintech firms like Opay, Paga, and Moniepoint that currently operate across rural Northern Nigeria (CBN, 2023; GSMA, 2021) [7, 11].

Although these achievements seem encouraging, there is still a lack of research in the academic literature regarding how much DFS is helping rural communities get access to markets and real economic empowerment. Market access here refers to the ability of rural communities to engage in purchasing and selling goods and services efficiently, profitably, and competitively, both within and outside their localities. Access to credit, safe savings alternatives, payment systems, and market information are frequently critical for rural economies, and these are areas where digital financial solutions can have a revolutionary impact (Akinbinu & Oladele, 2022) [4].

Empirical research on fintech and rural development in Nigeria is frequently national or urban-centric, failing to identify the unique issues and potential in the rural North (Yusuf & Fatai,

2021) [22]. This presents a key gap in understanding how digital financial tools are (or are not) transforming the economic reality of rural populations in locations like Northwestern Nigeria, where poverty, illiteracy, and insecurity intersect with low digital literacy and infrastructural weaknesses. The adoption of fintech in the region is further complicated by problems like gender-based access disparity, religious scepticism towards non-traditional finance, and security risks (such as displacement and banditry) (World Bank, 2022) [8].

By assessing the financial impact of digital financial services on rural market access in Northwestern Nigeria, this study seeks to close this gap. It notably intends to examine how DFS is influencing economic activities, including trade facilitation, loan availability, and savings mobilization among rural dwellers in selected states. It will depend entirely on secondary data from trustworthy sources such as EFInA, CBN, NBS, and international development institutions to deliver a detailed, data-driven regional analysis.

As a result, the study advances three main topics of interest for scholars and policymakers. First, it provides a region-specific analysis of DFS adoption and economic outcomes, helping to create spatially targeted financial inclusion programs. Second, it looks at quantifiable indices of economic participation, such as credit uptake, market expansion, and trade growth, rather than access measurements, to evaluate the economic empowerment potential of fintech. Third, the report emphasises continuing challenges to DFS acceptance in the region, such as digital illiteracy, infrastructural restrictions, and social resistance, presenting informed recommendations for inclusive policy reform and fintech innovation. Ultimately, this study argues that while fintech solutions are expanding rapidly, their transformative potential for rural economies in Northwestern Nigeria depends not just on technology availability, but also on enabling environments—including education, infrastructure, trust, and local customization. A solid, data-driven understanding of how digital financial services are affecting economic reality in these rural places is crucial to harness the full potential of fintech for equitable development in Nigeria.

Objectives

- To examine the extent of digital financial service adoption in rural communities of Northwestern Nigeria.
- To assess the impact of digital financial services on rural market access and economic activities.
- To identify the key challenges limiting the effective use of fintech in rural Northwestern Nigeria.

Statement of the research problem

Many rural populations in Northwestern Nigeria still have limited access to official financial tools and markets, despite the country's digital financial services growing quickly. The true economic impact of fintech in these rural places is still unknown, despite the fact that it has enormous potential to enhance trade, savings, and loan availability. This study tries to explore how digital financial services are influencing rural market access and what constraints continue to limit their efficient utilisation.

Methodology

In order to investigate how digital financial services affect rural market access in Northwestern Nigeria, this study uses a descriptive research design and only uses secondary data. Data were gathered from reliable sources such as the Central Bank of Nigeria (CBN), Enhancing Financial Innovation and Access (EFInA), the National Bureau of Statistics (NBS), and the World Bank, covering the period from 2015 to 2024. The study focusses on rural communities in Kano, Kaduna, Zamfara, Sokoto, Katsina, Jigawa, and Kebbi States. A content analysis technique was utilised to understand reports and datasets on fintech usage, rural trade, and financial inclusion. The data were thematically evaluated to determine trends in adoption, economic outcomes, and critical impediments limiting the usefulness of digital financial services in the region.

Conceptual clarifications

It is crucial to comprehend the fundamental ideas that guide this investigation in order to assess how digital financial services (DFS) improve access to rural markets in Northwestern Nigeria. These fundamental topics include digital financial services, financial inclusion, and rural market access. Each idea is connected to the others and together they provide a framework for the economic conditions of the area's rural residents.

Digital Financial Services (DFS)

The term "digital financial services" describes a wide range of financial goods and services that are obtained and provided via online platforms. Point-of-sale (POS) terminals, mobile phones, the internet, payment cards, and agent banking platforms are some examples of these channels (World Bank, 2022) [8]. DFS includes services that may be accessed without going to a physical bank branch, including bill payment, credit, insurance, savings, and mobile money transfers. The financial landscape in many developing nations has changed dramatically as a result of the transition from traditional brick-and-mortar banking to mobile and agent-based platforms.

DFS in Nigeria are mostly fueled by a mix of private sector innovation, especially through fintech firms, and regulatory measures. The Central Bank of Nigeria (CBN), for example, has implemented many frameworks to enhance outreach to rural and marginalised regions, including the Agent Banking Guidelines and the National Financial Inclusion Strategy (CBN, 2023) [7]. Fintech startups such as Opay, Moniepoint, Paga, and PalmPay have further extended the accessibility of digital financial solutions by developing agent networks across rural areas, including regions in Northwestern Nigeria.

Financial inclusion

is defined as the process of ensuring access to suitable, accessible, and timely financial goods and services to all persons and enterprises, particularly the underserved and low-income groups (Demirgüç-Kunt et al., 2022). It involves not only access to financial services but also their consumption and the quality of those services. Since it allows people to manage risks, invest in enterprises or education, and calm consumption

during economic downturns, financial inclusion is acknowledged as a key factor in both economic growth and the fight against poverty. In Nigeria, financial inclusion remains a big concern, particularly in rural and northern regions. Although formal financial inclusion is improving on a national level, regional differences are still very noticeable, according to EFINA (2023) ^[9]. Northwestern Nigerian states like Zamfara, Sokoto, and Kebbi continue to have among of the lowest rates of financial inclusion, primarily as a result of inadequate digital literacy, a lack of banking infrastructure, insecurity, and cultural hurdles. The expansion of DFS is consequently considered as a vital conduit to boosting financial inclusion in these underserved areas by overcoming existing limits through mobile and agent-based channels.

Rural market access

Rural market access means that people who live in rural areas can buy and sell goods and services in marketplaces. This lets rural producers, traders, and consumers take part in economic exchange. This comprises access to physical things (like transportation and market infrastructure), access to information (like pricing and demand data), and access to money (like payments, savings, and credit) (Barrett, 2008). Access to markets is important for making money, growing businesses, and improving people's lives in rural areas. Access to financial services is a key part of making it possible for people in rural areas to participate in the market. Digital credit and mobile payment solutions, for instance, can lower the costs and risks of transactions, boost sales, and provide new trade opportunities outside of local communities (Akinbinu & Oladele, 2022) ^[4]. Digital savings products can also help families in rural areas deal with changes in their income throughout the year and invest in assets that will help them be more productive. DFS not only give people the tools they need to make financial transactions, but they also encourage people to get involved in the economy and move about.

Relevance to Northwestern Nigeria

The combination of low financial inclusion, poor infrastructure, and economic instability in Northwestern Nigeria makes it an interesting place to study the effects of DFS. The region's primarily rural population depends significantly on small-scale farming, petty trading, and informal services for livelihood, however many lack access to formal credit, savings, or insurance systems. For many people who live there, traditional financial services are either too far away or too hard to get to because of cultural differences. However, the expanding presence of POS agents and mobile money services is reshaping access to finance and, as a result, access to larger economic opportunities (EFInA, 2023; PWC, 2022) ^[9, 16]. This study, therefore, conceptualizes digital financial services as a set of technology instruments that promote financial inclusion through mobile-based and agent-driven access to credit, savings, and payments. Rural market access is considered as the capacity of individuals and small companies in rural Northwestern Nigeria to participate

meaningfully in economic exchange, helped by better access to financial instruments. Determining the region's overall growth trajectory requires an understanding of how DFS affects this relationship.

Empirical literature on digital financial services

Digital financial services (DFS) are receiving more attention in development economics as means for financial inclusion, poverty alleviation, and trade facilitation. Empirical data indicates that DFS, in particular mobile money, point-of-sale terminals, and agent banking, has helped increase access to financial services in Nigeria, especially for groups that were previously excluded. However, the pace of adoption remains uneven, especially in rural and northern regions. According to the International Monetary Fund (2023), despite the fact that over 80% of Nigerian people use a mobile phone, the country's actual use of digital payments is still quite low when compared to peer economies because of concerns with trust, digital illiteracy, and infrastructure. This digital gap is considerably bigger in rural areas, where over half of the adult population remains financially excluded. A report by Enhancing Financial Innovation and Access (EFInA, 2023) ^[9] demonstrates that cultural or religious concerns about formal money, inadequate mobile network coverage, and restricted access to dependable electricity are the main obstacles to the rural adoption of DFS in Nigeria. These structural impediments result in a heavy dependency on informal finance sources, notably in the North. In Northwestern Nigeria, for instance, DFS penetration is far below the national average, despite the rise of agent banking services. Naira metrics (2024) revealed that weak connectivity in rural communities continues to lock millions of Nigerians out of the mobile money boom, especially in hard-to-reach parts of states like Zamfara, Sokoto, and Katsina. Other studies highlight supply-side difficulties such as exorbitant agent fees, limited digital infrastructure, and weak consumer protection regulations. A field-based investigation by The Guardian Nigeria (2023) showed that many rural DFS customers are deterred by frequent network breakdowns, irregular transaction outcomes, and a general lack of faith in mobile money carriers. This aligns with research from the Poverty Action Lab (2022), which found that although digital platforms have made trading in Kano and Jigawa states more convenient and cost-effective, issues like fraud, hidden charges, and delayed reversals have contributed to a decline in trust in DFS systems.

Importantly, several localized studies have demonstrated that DFS can dramatically improve economic involvement when enabling variables are present. For example, an empirical study carried out in Jigawa State discovered that low-income households' access to mobile money and agent banking enhanced their small-scale trading activities and savings habits; however, digital literacy and awareness campaigns were crucial to this success (Adebayo & Yusuf, 2023) ^[2]. These data imply that while DFS possess disruptive potential, their true impact relies on local conditions, infrastructure, and user capacities.

The empirical research as a whole paint a complex but instructive picture: while digital financial services have made it easier for some Nigerians to access formal banking and economic services, adoption and usage issues still plague rural areas, particularly in the North. These include infrastructural weaknesses, poor consumer protection, high operational costs, and a general lack of digital awareness. Therefore, it is impossible to assume that DFS will be successful in increasing rural market access in Northwestern Nigeria; instead, it needs to be contextually analysed based on regional enablers and restrictions.

Rural financial inclusion in Northwestern Nigeria

In Northwestern Nigeria, despite national initiatives to increase digital financial services (DFS), rural financial inclusion continues to be a major development concern. Through its National Financial Inclusion Strategy (NFIS), the Central Bank of Nigeria (CBN) has identified the North West as one of the regions most impacted by exclusion from formal financial institutions. Digital channels, including agent banking and mobile money, are identified as crucial tactics in the updated NFIS 2.0 to reach underserved communities in low-income and rural locations (CBN, 2023) ^[7]. Despite these measures, Northwestern states such as Zamfara, Kebbi, and Sokoto continue record among of the lowest levels of financial inclusion in the country (EFInA, 2023) ^[9]. Empirical research demonstrates that although digital financial platforms have the ability to address this inclusion gap, their adoption in rural northern Nigeria is impeded by deep-rooted structural problems. Agent banking may greatly increase rural women's access to financial services when properly coordinated, as shown by a World Bank-supported pilot in Northern Nigeria that increased formal financial participation from 15% to 34% in less than a year (Froeling & Garcia, 2021) ^[10]. These results imply that DFS acceptance in conservative and underprivileged communities is mostly dependent on accessibility, confidence, and closeness, especially when supported by local female agents.

However, widespread adoption remains hampered by significant infrastructural and regulatory constraints. Many DFS agents in rural regions operate in conditions lacking constant energy, mobile network coverage, and secure operational environments (Sustainable DFS, 2021). In Northwestern Nigeria, service reliability is further weakened by frequent network outages and the vandalization of telecommunications infrastructure, especially in areas impacted by insecurity (Aljazirah News, 2025) ^[5]. Additionally, informal taxation by local government authorities, hefty registration fees, and different levies across federal and state agencies hinder agent engagement in rural locations, limiting access points for customers (Sustainable DFS, 2017) ^[18]. Cultural and gender-related factors also play a vital influence. In many sections of rural Northwestern Nigeria, social norms restrict women's mobility and connection with male agents, consequently limiting their access to digital financial instruments. To address this, specialised projects such

as the African Development Bank's female agent initiative have created women-led digital finance networks to promote uptake among female clients (ADFI, 2021) ^[3]. Such gender-responsive measures are vital in regions where conservative norms determine access to economic resources. Efforts by the Universal Service Provision Fund (USPF) and Nigeria's larger digital economy policy are gradually supporting infrastructure expansion in distant locations. These include rural broadband expansion, shared infrastructure models, and enhanced licensing procedures for DFS operators (World Bank, 2019; USPF, 2024) ^[21, 20]. However, even though rural financial inclusion is gradually growing throughout the North West, institutional reforms, capacity-building, and regionally tailored solutions are necessary for the sustainable acceptance of digital services.

Digital financial services and rural market access

In development studies, the relationship between rural market access and digital financial services (DFS) is becoming more and more prominent, particularly in low-income and rural economies. DFS play a significant role in facilitating smoother economic activities, helping rural populations to save, borrow, make payments, and engage in marketplaces that were previously out of reach due to infrastructural and institutional obstacles. The growth of agent banking and fintech platforms in Nigeria has reduced reliance on cash-based transactions and informal networks by providing rural residents with additional avenues for economic activity (EFInA, 2023) ^[9]. Empirical research indicates that access to DFS greatly decreases transaction costs, promotes corporate efficiency, and improves access to broader regional markets. For instance, mobile money and point-of-sale (POS) technologies have enabled rural traders and farmers to receive payments securely, manage finances digitally, and access microcredit to boost their businesses (Adebayo & Yusuf, 2023) ^[2]. In Kano and Kaduna states, smallholder farmers contacted by Poverty Action Lab (2022) indicated that DFS allowed them to connect with urban markets through digital platforms, enhancing both revenue stability and consumer outreach. Similarly, traders in rural Jigawa reported that mobile banking enabled speedier transactions and expanded their customer base, particularly during peak market seasons.

Additionally, DFS have boosted remittance flows and household liquidity, allowing rural people to invest in market-oriented companies, including agricultural inputs and transport services. Froeling and Garcia (2021) ^[10] underline that agent banking services lowered travel time and costs connected with banking, so indirectly enabling more frequent participation in formal and informal markets. This mobility and financial access are particularly important in isolated areas with little physical market infrastructure. However, despite these benefits, problems continue that limit the full potential of DFS to promote rural market access. Issues like as poor mobile networks, limited agent coverage, lack of understanding, and hefty transaction prices still restrict widespread implementation (Sustainable DFS, 2021). Socio-cultural norms

that limit women's access to financial tools and economic engagement, as well as their ability to trade outside of local marketplaces, add layers of exclusion (ADFI, 2021) ^[3]. In Northwestern Nigeria, where rural economies rely mainly on agriculture and petty trading, the introduction of digital finance technologies is progressively revolutionizing how people access markets. Yet, the research suggests that for DFS to sustainably improve market outcomes, complementing investments in education, infrastructure, and digital literacy are required. Without addressing these basic challenges, digital banking may worsen existing disparities in access to market resources and restrict the desired developmental benefits.

Theoretical framework

The foundation of this research is Everett Rogers' Diffusion of Innovation Theory (2003). The theory explains how new ideas, technology, or practices spread within a social system throughout time through specialized routes. According to Rogers, acceptance of an innovation depends on elements such as perceived utility, compatibility with established habits, ease of use, and the influence of opinion leaders within a community. This theory is pertinent to the current study because digital financial services, including agent banking, POS terminals, and mobile money, are examples of financial innovations whose uptake in rural Northwestern Nigeria is influenced by social, cultural, economic, and infrastructure considerations. Understanding how rural folks use or resist these services helps explain the pace and impact of fintech adoption on market access and economic participation in the region (Rogers, 2003) ^[17].

Findings and discussion

Digital financial services (DFS) are becoming more widespread in Northwestern Nigeria, but their capacity to open up rural markets is still unequal and heavily reliant on local circumstances, according to the study's findings. Even though agent banking and mobile money platforms have become widely available, particularly in urban and peri-urban areas, evidence from EFInA (2023) ^[9] and the World Bank (2022) ^[8] shows that rural communities continue to face significant obstacles like poor connectivity, low digital literacy, and cultural limitations. These obstacles have slowed the speed of DFS implementation and, by extension, hindered the spread of formal financial systems into rural markets.

The fact that DFS clearly improves rural economic participation in areas where it is well implemented is a significant discovery. To collect payments, obtain credit, and better manage their income, businessmen and farmers in states like Jigawa and Kano are now using point-of-sale (POS) services and mobile money. These resources enable consumers to engage in wider market networks, both inside and outside of their local communities, and lessen dependency on currency and unofficial lending, this is similar to the view of Adebayo & Yusuf, (2023) ^[2]. For example, because of higher liquidity, female petty merchants reported faster reinvestment in their

enterprises and greater safety in financial transactions. This coincides with Rogers' (2003) ^[17] Diffusion of Innovation Theory, which indicates that adoption is more likely when innovations are regarded as relevant, easy to use, and suitable with users' lifestyles. However, adoption remains biased toward communities with higher infrastructure and better access to education. The expense of accessing services, insufficient agent coverage, and trust difficulties continue to be major obstacles in more distant regions, including parts of Zamfara, Kebbi, and Sokoto. Additionally, gendered conventions continue to limit women's access to DFS. As stated by ADFI (2021) ^[3], many women in rural North West Nigeria feel more comfortable dealing with female agents due to religious and cultural expectations. Where female-led agent networks were formed, there was a considerable improvement in women's financial participation and confidence in utilizing DFS. The discussion also indicates that while fintech solutions have widened access, they have not entirely addressed deeper structural challenges. For example, even where DFS systems exist, poor financial literacy has led to misuse, fraud exposure, and low retention. Additionally, unreliable networks and hefty transaction charges frequently irritate consumers and deter them from using the service again. These problems indicate to a fundamental need for holistic initiatives that combine digital innovation with infrastructure development, education, and community engagement. Overall, the findings imply that DFS have substantial potential to promote rural market access in Northwestern Nigeria, but their influence is moderated by social, physical, and institutional factors. To maximize the developmental benefits of DFS in rural economies and deepen inclusion, policy measures that support gender-inclusive service delivery, boost remote digital infrastructure, and assist financial education are crucial.

Conclusion

Using secondary data, this study investigated the impact of digital financial services (DFS) on rural market access in Northwestern Nigeria. The data reveal that while DFS platforms like mobile money and agent banking have made substantial progress, their acceptance and impact remain inconsistent across the region. As indicated in Table 1, states like Kano and Jigawa have significantly better mobile money usage and agent penetration, leading to more market participation and improved access to financial tools. However, instability, cultural constraints, and infrastructure limitations still hamper digital participation, particularly for women, in states like Sokoto, Zamfara, and Kebbi. The study indicates that although DFS have the potential to enhance rural livelihoods and boost economic inclusion, their performance hinges on local circumstances. Gender sensitivity, agent presence, financial knowledge, and digital trust all important. To be genuinely revolutionary, DFS must take a people-centered approach that listens to rural communities and addresses their real-world restrictions.

Recommendations

- Stronger investments in rural internet infrastructure, electricity, and mobile network coverage are required in Northwestern Nigeria to make digital banking services genuinely accessible. However, infrastructure must not be imposed from above. Government organizations such as the USPF and telecom providers should aggressively involve local leaders, market associations, and youth groups to ensure that services are located where they are actually needed and maintained with community ownership.
- Cultural conventions in the North frequently restrict women's access to male-dominated financial services. Encouraging the recruitment and training of female agents can assist narrow this gap. Development partners and fintech firms should work to scale up successful female-agent initiatives, especially in conservative communities, where trust and familiarity may make or break adoption.
- High transaction fees, taxes, and erratic service are major problems for many rural brokers. Government incentives, such as tax breaks, startup grants, or mobile infrastructure subsidies, should be made available to agents working in remote areas. This will increase service availability and lower the economic burden on end consumers.
- A key impediment to DFS adoption is the lack of user awareness. Through the use of visual storytelling, town hall meetings, and radio jingles, financial literacy initiatives may demystify mobile banking, shield consumers against fraud, and enable them to make wiser financial decisions. These campaigns must be practical, regionally customized, and preferably in Hausa and Fulfulde.
- Value chains in petty trade, livestock, and agriculture should be connected to DFS platforms to provide access to rural markets. Using mobile wallets, for example, farmers should be able to directly receive crop payments or input subsidies. Market traders should have access to microloans or insurance through DFS. Linking finance with livelihoods will provide people a clear motivation to adopt and use digital tools.

Acknowledgment

The authors are immensely grateful to the Tertiary Education Trust Fund (TET Fund, Nigeria) for funding support to this research work under the Institutional Based Research (IBR) intervention (TETF/DR&D/CE/UNI/TALATA MAFARA/IBR/2025/VOL.I).

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