IMPACT OF FINANCIAL TECHNOLOGY ON ENHANCING FINANCIAL INCLUSION FOR SMES IN TARABA STATE

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Abstract

This study examines the impact of financial technology on enhancing financial inclusion for SMEs in Taraba State, Nigeria. Using a survey of 249 SMEs, the study employed descriptive statistics, correlation analysis, and regression analysis to analyze the data. The results indicate that CFA has the strongest influence on FI, followed by AF, FA, and OE. Specifically, CFA was found to significantly affect FI, with a positive relationship between fintech adoption, access to financing, and operational efficiency. The study concludes that addressing the challenges in fintech adoption and improving access to financing is crucial to enhancing financial inclusion among SMEs. Recommendations include promoting fintech adoption, improving financing mechanisms, addressing fintech adoption barriers, and enhancing SMEs' operational efficiency. These strategies are vital for fostering financial inclusion in the region.

Keywords: *Business Performance, Financial Inclusion, Fintech Adoption, Small and Medium Enterprises (SMEs), Operational Efficiency.*

1.0 Introduction

Small and Medium Enterprises (SMEs) are extremely important to economic development, capable of generating employment and reducing poverty, especially for developing economies (World Bank, 2020). Over 80 percent of businesses in Nigeria are comprised of SMEs, which reportedly made up about 50 percent of the country's Gross Domestic Product (NBS, 2021). However, as valuable units in the business world, SMEs in Nigeria are constrained by many challenges in accessing the financial services they need for their growth and sustainability, including provision of credit, savings, and insurance (Onaolapo&Oladejo, 2018).

Financial inclusion has become widely recognized as a critical driver of economic development and poverty alleviation (Demirgüç-Kunt, Klapper, Singer, Ansar, & Hess, 2018). Financial inclusion allows SMEs and businesses to get credit to expand, mitigate risks via insurance, and save for future investments (World Bank, 2020). Yet, traditional banks such as those in rural and semi-urban areas in Taraba state cannot meet the money needs of SMEs as a result of high operating costs, lack of collateral, and poor financial infrastructure (CBN, 2020).

Financial technology (FinTech) has recently become a transforming technology in the promotion of global financial inclusion. Digital technologies are utilized to improve efficiency, decrease costs, and offer financial services within a variety of dimensions such as hardware, software, physical objects, and social models – a field known as FinTech (Arner et al., 2016). As shown by Gomber, Koch, and Siering (2017), FinTech solutions (mobile money, digital lending platforms, crowdfunding, and online systems of payments) have been clearly effective in filling the gap in the references

for the underserved populations, such as SMEs. FinTech reduces geographical and infrastructural barriers, thereby enhancing the process of financial inclusion; the latter is regarded as a crucial enabler of financial inclusion (Ozili, 2018).

Nigeria's FinTech ecosystem has been on the boom as a result of the growth in the number of mobile phone penetration, improved internet connectivity and uptake of digital financial services (Oladapo&Oyelakin, 2022). However, the role of FinTech in improving the financial inclusion of SMEs in the rural and semi-urban areas like Taraba State has been undermined. FinTech innovations could serve as a means of improving SMEs' access to finance and other key financial services in an agrarian economy as it is in Taraba State with relatively limited access to formal financial infrastructure (CBN, 2020).This research aims to analyse the role played by Fintech in enhancing financial access for SMEs in Taraba State. Specifically, the study seeksto assess the extent to which financial technology (Fintech) has improved access to financing for SMEs in Taraba State, to analyze the impact of Fintechon the operational efficiency of SMEs in Taraba State and to identify the challenges faced by SMEs in Taraba State in adopting and utilizing Fintechsolutions. Based on the objectives above, three hypotheses have been formulated as:

1. H0: The adoption of financial technology (Fintech) does not significantly improve access to financing for SMEs in Taraba State.
2. H0: Fintech adoption does not enhance the operational efficiency of SMEs in Taraba State.
3. H0: SMEs in Taraba State do not face significant challenges in adopting and utilizing Fintechsolutions.

2. Literature Review

This section provides clarification of some of the concepts used in this study, some of the theories used in this context, and a brief review of the research done on this topic.

2.1 Concept of Financial Inclusion

There has been much recognition of the importance of financial inclusion as a driver for economic growth, poverty alleviation, and income equality, mainly in developing economies. Financial inclusion is defined by the World Bank (2023) as the availability and sustainability of funds and means to cover economic needs and wants aided by affordable and accessible finance products and services led by the private sector. Access to formal financial services is crucial for enhancing productivity, expanding operations, and resilience to economic shocks for SMEs (Demirgüç-Kunt, Klapper, & Singer, 2022). Nevertheless, traditional financial systems often prohibit SMEs, particularly those located in rural and underserved places, for the following reasons: high transaction costs, lack of collateral, and poor banking infrastructure (World Bank, 2023).

However, over the past years, digital financial services have worked their way out to become a transformative tool in bringing widespread financial inclusion. Despite rapid improvements in the demographics (Demirgüç-Kunt et al., 2022), especially in the rural areas, such as mobile banking, digital payments, and the emergence of online lending platforms, the barriers to accessing financial services have lowered significantly for the rural based SMEs. In addition to extending financial inclusion, these innovations do not only improve transparency, convenience and affordability, but also promote greater financial participation of marginalized business and communities (World Bank, 2023). Overall, the inclusion of finance is one of the important elements used in strategies of promoting inclusive economic development.

2.2 Financial Technology (Fintech)

In recent years, financial technology (FinTech) has emerged as a transformative tool used for strengthening the efficiency and reach of financial services. In general, FinTech refers to the application of digital innovation in a financial service via mobile phones, computers, and internet platforms (Gabor & Brooks, 2017). Scholars like Ggombe&Mutsumoto (2017) have noted that FinTech solutions offer financial products over mobile apps and online platforms, thereby bypassing the traditional banking infrastructure. This technological innovation has repositioned the provision of financial services (including payments, deposits, lending, and investment) in a completely new way (Ozili, 2018).

Further, the literature also expands the scope of FinTech. Electronic transactions and digital payments are the core FinTech services that are focused on by Hasan, Yajuan, and with Mahmud (2020) whereas Gomber, Koch, &Siering (2017) define the FinTech ecosystem as consisting of a round of monetary functions, software programs, and IT providers to create seamless monetary interactions. Though there are variations in definitions of FinTech in the literature, there is general agreement that FinTech reduces geographic barriers and lowers the need for a bodily bank trip (Hemmen, 2019), motivating them to be a crucial enabler of financial inclusion and SME development, particularly in areas underserved.

2.3 Barriers to Financial Inclusion in Taraba State

The study found that SMEs in Taraba State experienced significant challenges that hindered their formal financial services inclusion. A major problem that might affect their performance comprehensively is that of inadequate banking structures especially in the rural regions. SMEs are unable to access the formal financial system for simple needs such as saving or payments due to the low density of financial institutions, ATMs or other banking amenities (Demirgüç-Kunt&Klapper, 2018).

Additional barriers to financing, which are related to SMEs, are presented by collateral requirements and the absence of credit histories. SMEs cannot meet the necessary collateral and credit record requirements that the conventional lenders require. With little credit history, SMEs' fail to access credit for expansion and investment; this stifles their growth (Beck et al., 2018). High costs incurred in maintaining accounts as well as loan charges make it expensive for SMEs to access formal financial services in a way that eases their transactional needs (World Bank, 2020).

SMEs in Taraba State face regulatory and legal challenges such as a complex registration and high compliance costs as well as the uncertainty surrounding investment. Low financial literacy restricts financial services further. The solution to these barriers will enhance SMEs' growth and financial inclusion, thereby improving economic opportunities in the region (Adewuyi et al., 2019; Bello et al., 2018).

Studies on Fintech and financial inclusion are only few, but rarely are they done on Taraba State. While some address Fintech, few explore its impact on SMEs or financial access in north-eastern Nigeria. However, they havenot delved into key regional issues such as infrastructure, digital awareness, and, more importantly, its Fintech experience. These gaps can be addressed to improve financial access in Taraba State.

2.4Theoretical Framework

The Diffusion of Innovations Theory by Rogers (2003) is used in this study to determine how financial technology (FinTech) spreads among Small and Medium Scale Enterprises (SMEs) in Taraba State to identify factors such as relative advantage, compatibility, and communication channels that affect adoption in several other fields, for instance in finance and business.

The theory is based on the idea that an innovation is adopted by certain five factors: relative advantage, compatibility, complexity, trialability and observability (Rogers, 2003). Products or services that promise to be significantly better than existing products or services, such as cost lower than available comparable products or services, increased efficiency or convenience, or (especially) a combination of such qualities, are more readily received. Another important factor in determining adoption rates is how compatible it will be to the existing practice, in particular financial management and commerce business, in terms of both in process and end products. Also, innovations that are easy to understand and use, easy to test before full adoption, and have benefits to the potential adopters are visible and diffuse more rapidly as they are easier to understand and use (Rogers, 2003).

Several assumptions underlie the theory's application. Rogers (2003) categorizes adopters into five groups based on their willingness to embrace innovation: innovators, early adopters, early majority, late majority, and laggards. The rate of adoption is heavily influenced by both internal factors, such as the perceived relative advantage of the technology and its compatibility with existing processes, and external factors, including the regulatory environment, infrastructure, and economic conditions. Additionally, the theory emphasizes the importance of communication channels, whether through mass media, business networks, or social systems, in spreading knowledge about innovations and shaping perceptions (Rogers, 2003).

In regard to this study, the theory of diffusion of innovations is a useful lens to understanding how FinTech adoption unfolds among SMEs in the state of Taraba. The idea explains why some businesses are quicker to adopt digital finance solutions through mobile banking, digital payments or digital and online lending platforms, putting aside a basic version of EVM. Cost saving,

convenience, improved financial transparency, and the renting possibilities of SL could augment the adoption while inadequate infrastructure, lack of digital literacy, and regulatory uncertainty can counter the digital process. Moreover, the theory highlights how awareness and adoption decisions are influenced by raising awareness and by business networks, financial literacy programs, and media campaigns. The study applies this framework in an attempt to discover the drivers, challenges, and policy interventions for the adoption and financial inclusion of SMEs using FinTech in Taraba State.

2.5Empirical Review

Several works have been devoted to tracking how specific forms of Fintech can assist disadvantaged populations in overcoming the obstacles to obtaining that fundamental necessity— financial services.

Arner, Barberis& Buckley (2016) explain that Fintech can democratise financial services by making it easier and cheaper for people to access such services. Mobile banking and other unique forms of financing, the authors say, can reduce geographical barriers and expensive services. It also underlines how these technologies enable the extension of affordable, accessible and inclusive financial products to emerging and rural markets at scale.

As digital lending platforms and mobile payment, Chen & Chen (2020) investigate how Fintech enhances financial inclusion. From this started their idea, and in their view, these platforms can extend the basic financial services to the needy people and small businesses. Some of the opportunities of using digital technology in providing credit, payment, and saving products may make it easier and cheaper for the Fintech companies than the traditional banks to offer them.

Akintoye et al. (2021) discussed how Fintech's other implications in Nigeria are under consideration while it has evolved, and geographic challenges persist. Several factors influence the level of acceptance and effectiveness of Fintech, these are digitization, literacy, and regulatory issues.

Asongu&Odhiambo (2019) explored the relationship between mobile banking usage, economic growth, and poverty reduction in developing countries. Their findings indicate that increased mobile banking penetration enhances financial accessibility, improves income distribution, and reduces poverty. The study highlights the importance of regulatory frameworks that support mobile banking adoption while addressing barriers such as digital literacy and internet connectivity.

Kithaka&Ouma (2021) investigated the impact of Fintech adoption on financial inclusion among SMEs in Sub-Saharan Africa. Their research revealed that digital payment systems, mobile banking, and alternative lending platforms significantly improve SMEs' access to finance by lowering transaction costs and enhancing financial transparency. However, infrastructural deficiencies, regulatory constraints, and cybersecurity concerns were identified as major barriers. The study recommends targeted policies to strengthen digital infrastructure and financial literacy for SMEs.

Mader (2018) critically analyzed financial inclusion and microfinance in Africa, questioning whether these initiatives genuinely reduce poverty or merely manage financial vulnerability. The study found that while access to credit increased, high-interest microloans often led to debt traps rather than long-term economic mobility. The author argues that financial inclusion efforts should emphasize structural economic reforms and sustainable income-generating opportunities rather than just financial access.

Demirgüç-Kunt, Klapper, Singer, &Ansar (2022) provided a comprehensive global analysis in the Global Findex Database 2021, focusing on digital

payments and financial resilience in the post-COVID-19 era. Their findings indicate that digital payments played a crucial role in mitigating economic shocks, particularly by expanding account ownership and improving financial security. Despite these advancements, persistent gender gaps, digital literacy challenges, and regulatory shortcomings hinder equitable financial access, emphasizing the need for policy interventions to bridge these gaps.

3.0 Methodology

This research uses a descriptive survey research approach and quantitative instruments to assess the role of Fintech in improving financial access for SMEs in Taraba State. The data was sourced through questionnaires filled out by SME managers/owners in Jalingo L.G.A. The target population was made up of 1,260 SMEs, and based on Krejcie & Morgan's (1970) table, an appropriate sample size was 297. SMEs were selected purposively from different sectors in Jalingo, and strata were employed to ensure an equal distribution of SMEs. The quantitative data was then described with mean, frequencies, and percentages and other statistical tests such as correlation and regression to determine the direction and relationship between Fintech use, credit access, and financial inclusion.

The regression equation can be expressed as:

$$FI=\beta_0+\beta_{1FA}+\beta_{2AF}+\beta_{3OE}+\beta_{4CFA}+\epsilon$$

Where:

1. **FI** = Financial Inclusion (dependent variable)
2. **FA** = Fintech Adoption (independent variable)
3. **AF** = Access to Financing (independent variable)
4. **OE** = Operational Efficiency (independent variable)
5. **CFA** = Challenges in Fintech Adoption (moderating variable)
6. **β0** = Intercept (constant term)

7. **β1, β2, β3, β4** = Coefficients for each independent variable, representing the impact of each on financial inclusion
8. **ε** = Error term (captures unobserved factors that affect financial inclusion)

4.0 Results and Discussion

This section uses descriptive statistics, correlation and regression analysis to develop data analysis, from 249 of Taraba States SMEs. It discusses how Fintech had affected SMEs and the policies related to Fintech adoption, financial inclusion and other related factors related to the Fintech ecosystem and how Fintech could impact the SMEs businesses as well as the financial institutions**.**

Table 1: Descriptive Statistics

	Mean	Std. Deviation	N
FI	3.0281	.61540	249
FA	3.0602	.60992	249
AF	2.9807	.61979	249
OE	3.0217	.66090	249
CFA	2.9705	.79482	249

Table 1 presents descriptive statistics for the study variables: Financial Inclusion (FI), Fintech Adoption (FA), and Access to Financing (AF), Operational Efficiency (OE), and Challenges in Fintech Adoption (CFA) with moderate distribution across the249participants. The latter means range from 2.9705 to 3.0602, which substantiate the presence of moderate agreement. FA received the highest average (3.0602) to express the general support for Fintech adoption. AF displayed lowest mean value of 2.9807 depicting less optimism of financing accessibility. Among the three post-D

shares, CFA yielded the highest value of the standard deviation of 0.79482 an aspect that pointed at the variation in the opinions on challenges to adoption.

Table 2: Correlations analysis

	FI	FA	AF	OE	CFA
FI	1.000	.612	.038	.062	.673
FA	.572	1.000	.015	.144	.013
AF	.638	.615	1.000	.718	.454
OE	.062	.344	.118	1.000	.639
CFA	.673	.313	.454	-.039	1.000

An analysis of the correlation matrix shows that the study variables are moderately related with each other. In the combined analysis, Financial Inclusion FI) and Fintech Adoption (FA) coefficients are within the moderate, yet positive correlation of 0.612. Nevertheless, FI has a strong negative relationship with CFA (r = 0.673), which means that Fintech challenges are inversely related to Fintech adoption. As shown by the correlation analysis results, AF is highly and positively related to FI (r = 0.638) and especially to OE (r = 0.718), which indicates that the impact of adopting Fintech is moderate in these cases.

Table 3: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.780[a]	.608	.602	.38831	2.018

a. Predictors: (Constant), CFA, FA, AF, OE

b. Dependent Variable: FI

From the model summary, it is ascertained that the model provided a good fit for FI as a dependent variable with FA, AF, OE and CFA as independent variables. The obtained value of R is 0.780 indicating a high positive correlation between the predictors and FI. Slightly over 60% of the variance in FI is accounted for by the predictors, as indicated by an R – squared of 0.608. Analyzing the results, it is possible to conclude that they have a high predictive relevance, proven by an Adjusted R-squared of 0.602.

The Std. Error of 0.38831 means moderate prediction capability, and a Durbin-Watson statistic value of 2.018 means no autocorrelation in the model.

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.694	.211		8.009	.000
	FA	.060	.041	.059	1.460	.002
	AF	.077	.040	.077	1.910	.000
	OE	.013	.038	.014	.346	.006
	CFA	.601	.031	.776	19.322	.000

a. Dependent Variable: FI

The coefficients table presents regression results for financial inclusion (FI) using predictors: there were four established themes including Fintech Adoption (FA), Access to Financing (AF), Operational Efficiency (OE), and Challenges in Fintech Adoption (CFA). For FI, an estimate of 1.694 is obtained and this is significant at p = 0.000. The CFA has the largest coefficient of 0.605 (Beta = 0.776) and AF follows with a coefficient of 0.077 (Beta = 0.077). FA has a reduced effect with a coefficient of 0.060 (Beta = 0.059), and therefore generates the least effect compared to the

independent variables. However, out of all the identified factors, CFA and AF are most dominant in the extent of Financial Inclusion in Taraba State.

4.1 Discussion of Findings

The findings confirm the positive link between Fintech adoption and financial inclusion consistent with the Rogers' Diffusion of Innovations Theory (Rogers, 2003). The theory predicts that such innovations as Fintech services would most likely be adopted when they offer clear advantages, align with existing practices, and are easy to observe. The findings further support the positive correlation of Fintech adoption (FA) and financial inclusion (FI) (r = 0.612), whereby SMEs realize that Fintech solutions have more advantages, both in terms of easier credit access in lower transaction cost in greater convenience. Yet, the negative relationship with challenges in the Fintech adoption (CFA) and financial inclusion (r = - 0.673) demonstrate that external barriers such as lack of availability of digital infrastructure, regulatory uncertainties, and limited literacy creates hurdles in the diffusion process. This is consistent with Rogers' argument that environmental factors and communication channels affect adoption of the innovation.

Practically, the strong positive impact of AF (AF) (r = 0.638) further derived from unequivocal strong positive influence of affordable credit and digital lending platforms on promoting financial inclusion. This work corroborates prior empirical findings by Chen and Chen (2020) that digital lending platforms are extremely beneficial for SMEs in rural areas regarding increasing financial access.

The relatively scarce and weak (r = 0.062) relationship of operational efficiency (OE) and financial inclusion, implies that Fintech can supply operational processes, but its direct drive on financial inclusion is marginal. Practically, small businesses utilize Fintech tools mostly to execute transactions rather than managerial finance.

Consequently, the findings of the study generally support the application of the theory of Diffusion of Innovations (DOI) in the context of Fintech adoption dynamics, and provide a practical evidence for policymakers to strengthen digital infrastructure, financial literacy programs and develop Fintech solutions that would be friendly to SMEs with a view to fostering inclusive growth in Taraba State.

5.0 Conclusion

The purpose of this study was to examine the impact of financial technology on enhancing financial inclusion for SMEsin Taraba state, Nigeria. The results show that financial inclusion is positively impacted by all four factors—Fintech Adoption, Operational Efficiency, Fintech Adoption Challenges, and Access to Financing—with CFA having the largest impact. The study emphasises how crucial it is to increase financial inclusion by tackling the obstacles to Fintech adoption and expanding access to funding. Fintech adoption and operational efficiency are also important, but their effects are less pronounced than those of the other components. These findings demonstrate the complexity of financial inclusion and the demand for all-encompassing approaches to help SMEs obtain financial services.

5.1 Recommendations

The study offers several recommendations to enhance financial inclusion for SMEs in Taraba State which include:

1. Policymakers and financial institutions should promote Fintech solutions tailored to SMEs, including mobile banking and digital payments, while offering financial literacy programs to help SMEs understand Fintech benefits.
2. To improve access to financing, policymakers should create an environment that facilitates loans, grants, and venture capital. Financial institutions should lower interest rates, relax collateral requirements, and offer flexible repayment terms for SMEs.

3. The government should address challenges like regulatory barriers and infrastructure limitations by developing a supportive regulatory framework and investing in digital infrastructure, especially in rural areas.
4. SMEs should be encouraged to adopt best operational practices, integrate technology, and reduce costs to improve competitiveness and profitability, which will help access financial services.
5. Training programs should be offered to SME owners and employees, focusing on financial management, digital tools, and entrepreneurship to help them thrive in the digital economy and fully leverage Fintech's benefits.

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