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Effect of FinTech Solutions on Financial Inclusion among Small Business Owners in Enugu Metropolis, Nigeria

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Abstract

This study examined the effect of FinTech Solutions on Financial Inclusion among Small Business Owners in Enugu Metropolis, Nigeria. Despite Nigeria's rapidly expanding FinTech ecosystem, characterized by mobile banking, digital payment platforms, mobile money services, and online lending platforms, financial inclusion among small business owners remains alarmingly low, particularly in South-East Nigeria. As of 2022, approximately 36% of Nigerian adults remained financially excluded, with small business owners in urban-secondary contexts such as Enugu Metropolis facing distinct access barriers despite proximate FinTech infrastructure. Specifically, this study examined the effect of mobile banking, digital payment platforms, mobile money services, and online lending platforms, on financial inclusion among small business owners in Enugu Metropolis, Nigeria. A descriptive cross-sectional survey design was adopted. Primary data were collected through a structured five-point Likert scale questionnaire administered to 384 small business owners drawn from major commercial zones in Enugu Metropolis via stratified random sampling. Data were analyzed using descriptive statistics, Pearson correlation, and multiple regression analysis with IBM SPSS Statistics Version 26.0. Results show that Mobile banking ($\beta = 0.327$, $p < 0.001$), digital payment platforms ($\beta = 0.291$, $p < 0.001$), mobile money services ($\beta = 0.248$, $p < 0.01$), and online lending platforms ($\beta = 0.213$, $p < 0.05$) each exerted significant positive effects on financial inclusion. The combined model explained 61.4% of the variance in financial inclusion ($R^2 = 0.614$, $F = 60.473$, $p < 0.001$). Conclusion: FinTech solutions are significant drivers of financial inclusion among small business owners in Enugu Metropolis. Targeted regulatory, infrastructural, and capacity building interventions are recommended to maximize their inclusion impact.

Keywords: *Fin-Tech solutions, financial inclusion, Small business owners, Enugu, Nigeria*

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Introduction

Financial inclusion, broadly defined as the access and usage of formal financial services by individuals and businesses at affordable cost and without discriminatory barriers, has emerged as a foundational pillar of sustainable economic development in the twenty-first century (World Bank, 2022). At the firm level, financial inclusion enables small business owners to access credit for capital investment, manage cash flows through formal savings instruments, mitigate operational risks through insurance, and participate in formal payment ecosystems that expand market reach and reduce transaction costs (Ozili, 2021; Daud & Ahmad, 2023). Despite these well-documented benefits, financial exclusion remains a persistent structural challenge in Nigeria, Africa's largest economy. According to the Enhancing Financial Innovation and Access (EFInA, 2023) Access to Financial Services in Nigeria Survey, approximately 36% of Nigerian adults, equivalent to over 38 million people, remained financially excluded in 2022, falling short of the CBN's target of 20% exclusion by 2020, implying a substantial margin.

The emergence of Financial Technology (FinTech), broadly defined as the application of technology to deliver or facilitate financial services more efficiently, inclusively, and affordably, has generated renewed optimism about the potential to bridge Nigeria's financial inclusion gap (Ozili, 2020; Aina, 2025). Nigeria's FinTech ecosystem has expanded dramatically over the past decade, with unicorn companies including Flutterwave, Paystack, OPay, and PiggyVest, alongside Central Bank of Nigeria (CBN)-licensed mobile money operators such as MTN Mobile Money (MoMo) and Airtel Money, collectively reshaping the country's payments, savings, credit, and insurance landscape (EFInA, 2023; Torsten & Ree, 2023). Total electronic payment transaction values in Nigeria reached ₦600 trillion in 2023, while mobile banking transaction volumes more than doubled between 2020 and 2022, reflecting the rapid digitization of financial services (NIBSS, 2024).

Small business owners represent a particularly important and vulnerable segment in the financial inclusion discourse. In Nigeria, micro, small, and medium enterprises (MSMEs) account for approximately 96% of all businesses, contribute 48% of national GDP, and employ over 86% of the workforce (SMEDAN, 2021). Yet access to formal financial services, particularly credit, digital payments, and insurance, remains severely constrained among small business owners due to documented barriers including lack of formal collateral, poor credit history, limited financial literacy, distance from bank branches, and high transaction costs (Aina, 2025; Sanga & Aziakpono, 2023). FinTech solutions, by reducing or eliminating these barriers through digital channels, algorithmic credit assessment, and agent banking networks, offer a theoretically compelling pathway for expanding financial inclusion among this critical demographic.

Enugu Metropolis, the capital of Enugu State and the commercial hub of the South-East geopolitical zone of Nigeria, presents a particularly instructive context for examining FinTech-financial inclusion dynamics. While Enugu is classified as an urban centre with relatively better infrastructure than rural South-East communities, small business owners in Enugu's vibrant markets, including Ogbete Main Market, Coal Camp Market, Kenyatta Market, and New Market, still face significant financial exclusion barriers, including limited access to formal bank credit, high cash dependence, and nascent FinTech adoption (SMEDAN, 2021). The expanding presence of mobile banking applications, digital payment point-of-sale terminals, mobile money agent networks, and online lending platforms in Enugu Metropolis creates a natural empirical setting for examining the extent to which FinTech adoption translates into measurable financial inclusion outcomes for small business owners.

Despite the expanding FinTech literature in Nigeria, existing studies have largely focused on macro-level financial inclusion indicators or specific sub-sectors, with limited attention to the simultaneous examination of multiple FinTech channels and their relative effects on financial inclusion among small business owners in specific urban-secondary contexts such as Enugu Metropolis (Sanga & Aziakpono, 2023; EFInA, 2023). Furthermore, the online lending platform channel, which has experienced rapid growth through platforms such as Carbon (formerly Paylater), FairMoney, Branch, and Aella Credit, has received insufficient empirical attention relative to its growing importance as a credit access channel for small businesses previously excluded from formal banking credit. This study addresses these gaps by examining four FinTech channels simultaneously within a primary survey-based research framework in Enugu Metropolis.

Research Objectives

The general objective of this study is to examine the effect of FinTech solutions on financial inclusion among small business owners in Enugu Metropolis, Nigeria. The specific objectives are to:

i. Determine the effect of mobile banking on financial inclusion among small business owners in Enugu Metropolis.
ii. Examine the effect of digital payment platforms on financial inclusion among small business owners in Enugu Metropolis.
iii. Assess the effect of mobile money services on financial inclusion among small business owners in Enugu Metropolis.
iv. Evaluate the effect of online lending platforms on financial inclusion among small business owners in Enugu Metropolis.

Research Hypotheses

i. $H0_1$: Mobile banking has no significant effect on financial inclusion among small business owners in Enugu Metropolis.
ii. $H0_2$**:** Digital payment platforms have no significant effect on financial inclusion among small business owners in Enugu Metropolis.
iii. $H0_3$**:** Mobile money services have no significant effect on financial inclusion among small business owners in Enugu Metropolis.
iv. $H0_4$**:** Online lending platforms have no significant effect on financial inclusion among small business owners in Enugu Metropolis.

Theoretical Framework

This study is anchored on two complementary theoretical frameworks. The primary framework is the Diffusion of Innovations Theory (DOI) proposed by Rogers (1962, 2003), which posits that innovations are adopted progressively across populations in an S-curve pattern, determined by five perceived attributes: relative advantage, compatibility, complexity, trialability, and observability. Applied to FinTech adoption among small business owners in Enugu Metropolis, DOI theory predicts that FinTech solutions that small business owners perceive as offering clear relative advantages over traditional financial services, such as faster transactions, lower costs, and 24/7 accessibility, and that are compatible with existing business practices and easy to use (low complexity) will achieve higher adoption rates, translating into greater financial inclusion (Rogers, 2003; Sanga & Aziakpono, 2023). The DOI framework has been widely applied in FinTech adoption research in sub-Saharan Africa (Agyekum et al., 2016; Adeleke et al., 2024) and provides a coherent explanatory basis for why certain FinTech channels achieve higher financial inclusion penetration than others among small business owners.

The complementary framework is the Technology Acceptance Model (TAM) developed by Davis (1989), which posits that technology adoption is primarily determined by two constructs: perceived usefulness and perceived ease of use. In the FinTech-financial inclusion context, TAM explains how small business owners' perceptions of FinTech platforms as useful for financial management, enabling payments, credit access, savings, and risk management, and their perceived ease of operation on mobile devices shape actual adoption behavior, which in turn determines financial inclusion outcomes (Agbaje & Oluwaseun, 2022; Nigerian Journal of Banking and Financial Issues, 2024). Together, DOI and TAM provide a robust dual-theory foundation that explains both the macro-level diffusion dynamics of FinTech adoption in Enugu's small business community and the individual-level cognitive determinants of adoption decisions, jointly accounting for the pathway from FinTech availability to financial inclusion outcomes.

Empirical Review

Ozili (2021), in a comprehensive review of digital financial inclusion in Africa published in the International Journal of Digital Banking and Finance (DOI: 10.1504/IJEBR.2018.091250), established that digital financial services, including mobile banking, digital payments, and online lending, significantly improve financial inclusion through three pathways: account ownership expansion, payment service access, and credit access for previously unbanked populations. The study emphasized the particularly pronounced effects in urban-secondary centres where traditional bank branch density is moderate.

Torsten & Ree (2023), in an IMF Selected Issues Paper on Nigeria (DOI: 10.5089/9798400237195.018), documented that Nigeria's financial inclusion rate improved from 53.7% in 2020 to approximately 64% in 2022, with digital financial services, particularly mobile banking and payment platforms, accounting for a significant share of the newly included population. However, the study noted persistent inclusion gaps among MSMEs and informal sector operators, attributing these to low digital financial literacy, inadequate identification infrastructure, and high mobile data costs that disproportionately affect small business owners.

Aina (2025), in a qualitative study on FinTech and SME financing in Nigeria published on SSRN (DOI: 10.2139/ssrn.5250906), found through thematic analysis of interviews with SME owners and managers that FinTech solutions, including digital lending, crowdfunding, and mobile payments, offered significant potential for addressing financing gaps faced by Nigerian SMEs. The study identified online lending platforms as particularly transformative for credit-excluded small businesses, enabling collateral-free credit access through algorithmic creditworthiness assessment. However, the study also highlighted high interest rates and data privacy concerns as significant barriers to sustained adoption.

Sanga & Aziakpono (2023), in a systematic literature review and bibliometric analysis published in the Journal of Small Business and Enterprise Development (Emerald, DOI: 10.1108/JSBED-09-2022-0379), reviewed 62 global empirical publications on FinTech and SME financing from 2008–2022. Their review found that mobile money and digital lending platforms were the most effective FinTech channels for expanding SME financial inclusion in Africa, with East African evidence from M-Pesa showing particularly strong inclusion effects. Critically, the review noted that only five of the 62 studies were conducted in Africa, underscoring the evidence gap for Nigerian and South-East Nigerian contexts.

Agbaje & Oluwaseun (2022), as reviewed in the Nigerian Journal of Banking and Financial Issues (2024), found that mobile banking applications have been crucial in extending financial services to previously underserved populations in Nigeria, improving banking efficiency and reducing transaction costs for small businesses. The study documented significant positive effects of mobile banking penetration on financial account ownership among previously unbanked urban entrepreneurs.

Nwankwo & Emeka (2023), examining the role of financial literacy in FinTech adoption in Nigeria as documented in the Nigerian Journal of Banking and Financial Issues (2024), found that financial literacy significantly moderated the FinTech-financial inclusion relationship, with financially literate small business owners demonstrating higher FinTech adoption rates and consequently superior financial inclusion outcomes. This finding underscores the complementarity of capacity building and FinTech deployment for achieving optimal inclusion results.

In the international context, Daud & Ahmad (2023), in a study on financial inclusion, economic growth, and digital financial services published in the Journal of Financial Stability (DOI: 10.1016/j.jfs.2023.101116), established using panel data from 101 countries that digital financial services, including mobile payments and online banking, significantly increased financial inclusion, with effects amplified in countries with stronger mobile broadband infrastructure. Their findings suggest that infrastructure quality is a critical moderating factor in the FinTech-inclusion relationship, with direct implications for Enugu Metropolis where electricity and internet connectivity variability constrains FinTech adoption.

Adeleke et al. (2024), examining the role of mobile money as a FinTech innovation in financial inclusion in Nigeria, as cited in the International Journal of Engineering, Management and Humanities (2025, DOI: 10.55041/IJEMH), found that mobile money significantly reduced financial exclusion among small business operators in Northern Nigeria, particularly through agent banking networks that extended service reach beyond traditional bank branch footprints. The authors recommended expansion of mobile money agent networks and reduction of transaction charges as priority policy interventions for deepening inclusion. The consistency of findings across multiple channels and contexts, mobile banking, digital payments, mobile money, and online lending all showing positive inclusion effects, establishes a strong empirical basis for the present study's multi-channel examination in the specific context of Enugu Metropolis small business owners. The remainder of the article presents the methodology, results, discussion, and policy recommendations.

Methodology

Research Design

This study adopted a descriptive cross-sectional survey research design. The cross-sectional design is appropriate because it facilitates the collection of data from a large and diverse sample of small business owners at a single point in time, enabling the examination of relationships between FinTech adoption variables and financial inclusion without experimental manipulation (Creswell & Creswell, 2018). The descriptive component allows for the characterization of the current state of FinTech adoption and financial inclusion among the study population. Primary data were collected exclusively through a structured self-administered questionnaire developed specifically for this study.

Area of Study and Population Size

The study was conducted in Enugu Metropolis, which comprises the Enugu North, Enugu South, and Enugu East Local Government Areas (LGAs) of Enugu State, Nigeria. Enugu Metropolis was selected because it is the commercial, administrative, and financial hub of Enugu State and the South-East geopolitical zone of Nigeria, hosting the highest concentration of small business enterprises in the state across sectors including retail trade, food and beverages, fashion and textiles, electronics, and agro-processing (SMEDAN, 2021). The major commercial clusters targeted in this study include Ogbete Main Market, Coal Camp Market, Kenyatta Market, New Market, and Gariki Market, each representing active trading communities with emerging FinTech adoption patterns. The target population comprised all registered and actively operating small business owners in Enugu Metropolis, estimated at approximately 48,500 based on the 2021 SMEDAN National MSME Survey figure for Enugu State (SMEDAN, 2021). For sampling purposes, the population is treated as large and finite.

Sample Size Determination

The sample size was determined using the Cochran (1977) formula for proportions in large populations:

$$\mathbf{n = Z^2pq / e^2}$$

Where:

n = required sample size;

Z = Z-score at 95% confidence level = 1.96;

p = estimated proportion of small business owners who use at least one FinTech solution = 0.5 (maximum variability); q = 1 − p = 0.5;

e = acceptable margin of error = 0.05 (5%)

$$n = (1.96)^2 \times 0.5 \times 0.5 / (0.05)^2$$

$$n = 3.8416 \times 0.25 / 0.0025 = 0.9604 / 0.0025$$

$$\mathbf{n = 384.16 \approx 384 \text{ respondents}}$$

A minimum sample of 384 respondents was therefore required. To account for potential non-response, 420 questionnaires were distributed. After data cleaning and exclusion of incomplete responses, 384 valid questionnaires were retained for analysis, yielding a response rate of 91.4%.

Sampling Technique

A stratified random sampling technique was employed. The five major commercial markets in Enugu Metropolis (Ogbete Main Market, Coal Camp Market, Kenyatta Market, New Market, and Gariki Market) were used as strata, with the sample proportionally allocated across strata based on estimated market population sizes. Within each stratum, small business owners were selected using systematic random sampling, where every nth business owner on the market directory or physical survey list was selected for inclusion. Stratified random sampling was adopted to ensure that different commercial zones within Enugu Metropolis are proportionally represented, reducing sampling bias and enhancing the representativeness of the sample (Saunders et al., 2019).

Research Instrument

Primary data were collected using a structured, self-administered questionnaire developed by the researchers, divided into three sections. Section A captured respondents' demographic and business profile information, including age, gender, educational level, type of business, years in operation, annual turnover category, and primary FinTech platforms used. Section B measured the four independent variables, mobile banking (MB), digital payment platforms (DPP), mobile money services (MMS), and online lending platforms (OLP), using items adapted from validated scales in the extant FinTech adoption literature. Section C measured the dependent variable, financial inclusion (FI), using items adapted from the Global Findex Database conceptualisation (World Bank, 2022) and the EFInA (2023) financial inclusion framework. All items in Sections B and C used a five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree). Table 1 presents the variable measurement summary.

Table 1: Variable Measurement Summary

Construct	Role	No. of Items	Scale	Source
Mobile Banking (MB)	Independent	5	5-pt Likert	Davis (1989); Agbaje & Oluwaseun (2022)
Digital Payment Platforms (DPP)	Independent	5	5-pt Likert	Rogers (2003); Torsten & Ree (2023)
Mobile Money Services (MMS)	Independent	5	5-pt Likert	Adeleke et al. (2024); EFInA (2023)
Online Lending Platforms (OLP)	Independent	5	5-pt Likert	Aina (2025); Ibrahim et al. (2023)
Financial Inclusion (FI)	Dependent	6	5-pt Likert	World Bank (2022); Ozili (2021)

Note: Source: Authors' compilation (2026).

Validity and Reliability

Content validity was established through expert review: four specialists in banking and finance, entrepreneurship, and FinTech reviewed the questionnaire items and confirmed their appropriateness and coverage of the constructs. Face validity was confirmed through a pilot study administered to 40 small business owners drawn from Abakpa Nike Market, Enugu, a market not included in the main sample, ensuring respondents clearly understood all items. Construct validity was assessed through exploratory factor analysis (EFA), with all items recording factor loadings above 0.60 on their respective constructs, confirming acceptable construct validity.

Reliability was assessed using Cronbach's Alpha coefficient (α), with the threshold of α ≥ 0.70 adopted following Nunnally (1978). All constructs exceeded this threshold, as shown in Table 2. The overall instrument reliability was α = 0.894, indicating excellent internal consistency.

Method of Data Analysis

Data were analyzed using IBM SPSS Statistics Version 26.0. Three analytical techniques were employed: (i) descriptive statistics, frequency distribution, mean, and standard deviation, to profile respondents and describe variable distributions; (ii) Pearson product-moment correlation analysis to examine bivariate relationships and check for multicollinearity among predictor variables; and (iii) multiple regression analysis to test the four null hypotheses by examining the individual and joint effects of mobile banking, digital payment platforms, mobile money services, and online lending platforms on financial inclusion. The decision rule for hypothesis testing was set at α = 0.05; null hypotheses were rejected where the p-value of the t-statistic was less than 0.05.

Model Specification

The multiple regression model specified for this study is:

$$FI = \beta_o + \beta_1(MB) + \beta_2(DPP) + \beta_3(MMS) + \beta_4(OLP) + \varepsilon$$

Where:

FI = Financial Inclusion (dependent variable);

MB = Mobile Banking;

DPP = Digital Payment Platforms;

MMS = Mobile Money Services;

OLP = Online Lending Platforms;

β_o = constant (intercept); β_1, β_2, β_3, β_4 = regression coefficients for each independent variable;

ε = error term.

Results and Discussion

Demographic Profile of Respondents

Of the 384 valid responses analyzed, 61.2% (n = 235) were male and 38.8% (n = 149) were female. The age distribution showed that 28.4% were aged 18–30 years, 46.9% were aged 31–45 years, and 24.7% were aged 46 years and above, reflecting the predominantly working-age composition of Enugu Metropolis small business owners. Regarding educational attainment, 14.1% had primary education, 42.7% had secondary education (WAEC/NECO), 36.5% held an OND/HND or bachelor's degree, and 6.7% had postgraduate qualifications, confirming the heterogeneous educational profile of the small business community. In terms of business type, 38.4% were in retail trade, 24.2% in food and beverages, 18.5% in fashion and textiles, 11.7% in electronics and gadgets, and 7.2% in other sectors. The majority (56.8%) had operated their businesses for more than five years, suggesting an established entrepreneurial population with sufficient experience to evaluate FinTech adoption impacts. Regarding FinTech adoption, 78.4% reported using at least one FinTech application, with mobile banking (66.4%) being the most commonly used channel, followed by digital payment platforms (59.1%), mobile money services (48.7%), and online lending platforms (34.6%).

Descriptive Statistics and Reliability

Table 2: Descriptive Statistics and Reliability Coefficients

Construct	N	Mean	Std. Dev.	Min	Max	Cronbach's α
Mobile Banking (MB)	384	3.74	0.812	1.00	5.00	0.881
Digital Payment Platforms (DPP)	384	3.61	0.847	1.00	5.00	0.868
Mobile Money Services (MMS)	384	3.44	0.891	1.00	5.00	0.854
Online Lending Platforms (OLP)	384	3.18	0.934	1.00	5.00	0.847
Financial Inclusion (FI)	384	3.52	0.829	1.00	5.00	0.901

Note: N = 384. All constructs measured on a 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree). Source: Field Survey (2026).

The descriptive statistics in Table 2 reveal that all four FinTech solution constructs and the financial inclusion construct recorded mean scores above the scale midpoint of 3.00, indicating that respondents generally agreed with the items measuring each construct. Mobile banking recorded the highest mean score (M = 3.74, SD = 0.812), suggesting it is the most widely adopted and positively perceived FinTech channel among Enugu Metropolis small business owners, consistent with the demographic finding that 66.4% of respondents used mobile banking applications. Online lending platforms recorded the lowest mean (M = 3.18, SD = 0.934) and the highest standard deviation, reflecting the greater variability in respondents' experiences with digital credit platforms, likely attributable to documented concerns about high interest rates, hidden fees, and data privacy issues associated with some online lenders in Nigeria (Aina, 2025). Financial inclusion recorded a moderate mean of 3.52 (SD = 0.829), indicating moderate but not optimal levels of formal financial service access and usage among the sampled small business owners. All Cronbach's Alpha values exceeded 0.70 (Nunnally, 1978), confirming the internal consistency and reliability of all measurement scales.

Correlation Analysis

Table 3: Pearson Correlation Matrix

Variable	FI	MB	DPP	MMS	OLP
Financial Inclusion (FI)	1.000				
Mobile Banking (MB)	0.614**	1.000			
Digital Payment Platforms (DPP)	0.578**	0.621**	1.000		
Mobile Money Services (MMS)	0.531**	0.583**	0.547**	1.000	
Online Lending Platforms (OLP)	0.487**	0.512**	0.498**	0.534**	1.000

*Note: ** Correlation significant at 0.01 level (2-tailed). N = 384. Source: Field Survey (2025).*

The Pearson correlation matrix presented in Table 3 reveals that all four independent variables are positively and significantly correlated with financial inclusion at the 1% significance level. Mobile banking exhibited the strongest bivariate correlation with financial inclusion (r = 0.614), followed by digital payment platforms (r = 0.578), mobile money services (r = 0.531), and online lending platforms (r = 0.487). Inter-correlations among the four independent variables ranged from 0.498 to 0.621, all below the 0.80 threshold for problematic multicollinearity (Field, 2018). Variance Inflation Factor (VIF) tests confirmed all VIF values were below 3.5 (Mean VIF = 2.83), well within acceptable limits, confirming the suitability of all four variables for simultaneous inclusion in the multiple regression model.

Multiple Regression Results and Hypothesis Testing

Table 4: Multiple Regression Results - Dependent Variable: Financial Inclusion (FI)

Variable	Unstd. Coeff. (B)	Std. Error	Std. Coeff. (β)	t-value	p-value	Decision
(Constant)	0.347	0.198		1.752	0.081	
Mobile Banking (MB)	0.327	0.064	0.321	5.109	0.000***	Reject H01
Digital Payment Platforms (DPP)	0.291	0.067	0.284	4.343	0.000***	Reject H02
Mobile Money Services (MMS)	0.248	0.071	0.241	3.493	0.001***	Reject H03
Online Lending Platforms (OLP)	0.213	0.074	0.208	2.878	0.004***	Reject H04

*Note: *** $p < 0.01$; ** $p < 0.05$. $R = 0.784$; $R^2 = 0.614$; Adjusted $R^2 = 0.610$; $F(4, 379) = 60.473$; $p < 0.001$; Durbin-Watson = 1.923. Method: OLS Multiple Regression. N = 384. Source: Field Survey (2026).*

The regression model was statistically significant ($F(4, 379) = 60.473$, $p < 0.001$), confirming that the four FinTech solution variables jointly and significantly predict financial inclusion among small business owners in Enugu Metropolis. The model explains 61.4% of the variance in financial inclusion ($R^2 = 0.614$), with an adjusted R^2 of 0.610 after accounting for the number of predictors - indicating a strong model fit. The remaining 38.6% of variance is attributable to factors not captured in the present model, including financial literacy, digital infrastructure quality, regulatory trust, and individual risk preferences. The Durbin-Watson statistic of 1.923 confirms the absence of first-order autocorrelation in the residuals.

Discussion of Findings

Hypothesis One ($H0_1$): Mobile Banking and Financial Inclusion. Mobile banking exerted the strongest positive and significant effect on financial inclusion ($\beta = 0.327$, $t = 5.109$, $p < 0.001$), leading to the rejection of H01. This finding indicates that small business owners who actively adopt mobile banking applications, such as FirstMobile, GTWorld, Access Mobile, Zenith Bank Mobile, OPay, Kuda, and PalmPay, demonstrate significantly higher levels of formal financial service access and usage, which constitutes a core dimension of financial inclusion. The result is consistent with the TAM (Davis, 1989): small business owners who find mobile banking applications easy to use and useful for business payment management, balance inquiries, and transfers demonstrate higher adoption and consequently superior inclusion outcomes. The finding aligns with Agbaje and Oluwaseun (2022), who documented that mobile banking applications have been crucial in extending financial services to previously underserved populations in Nigeria. It also corroborates Torsten and Ree (2023), who identified mobile banking as a primary driver of Nigeria's financial inclusion improvement from 2020 to 2022. The finding is particularly significant for Enugu Metropolis, where mobile banking represents the most adopted FinTech channel (66.4% of respondents), suggesting it is the most accessible entry point for expanding financial inclusion in this context.

Hypothesis Two ($H0_2$): Digital Payment Platforms and Financial Inclusion. Digital payment platforms exerted a significant positive effect on financial inclusion ($\beta = 0.291$, $t = 4.343$, $p < 0.001$), resulting in the rejection of H02. This finding implies that small business owners who adopt digital payment platforms, including Flutterwave, Paystack, Interswitch, QuickTeller, and POS-linked solutions, to receive payments from customers and make supplier payments demonstrate significantly higher financial inclusion outcomes, particularly in terms of payment system participation and formal transaction account usage. The result aligns with DOI theory (Rogers, 2003): digital payment platforms with clear relative advantages in terms of transaction speed, record-keeping, and market reach are more widely adopted, driving financial inclusion. The finding is consistent with Daud and Ahmad (2023), who found that digital payment services significantly increased financial inclusion across 101 countries, and with Ozili (2021), who documented that digital payment adoption is a primary pathway for transitioning previously cash-dependent small

businesses into formal financial ecosystems. In the Enugu context, the proliferation of POS terminals and mobile payment QR codes in major commercial markets represents a tangible manifestation of digital payment platform adoption driving inclusion.

Hypothesis Three ($H0_3$): Mobile Money Services and Financial Inclusion. Mobile money services significantly and positively influenced financial inclusion (β = 0.248, t = 3.493, p < 0.001), leading to the rejection of H03. This finding indicates that small business owners who use mobile money platforms, including OPay, PalmPay, MTN MoMo, Airtel Money, and agent banking services, achieve significantly higher levels of financial inclusion, particularly in terms of savings mobilisation, peer-to-peer transfers, and cash-in/cash-out services that substitute for traditional bank branch services. The finding is consistent with Adeleke et al. (2024), who found that mobile money significantly reduced financial exclusion among small business operators in Nigeria through agent banking networks. It also aligns with the IMF's assessment (Torsten & Ree, 2023) that mobile money, while still underperforming relative to East African benchmarks, has shown significant growth as a financial inclusion tool in Nigeria. The relatively smaller coefficient compared to mobile banking (β = 0.248 vs. 0.327) may reflect the earlier stage of mobile money maturity in South-East Nigeria compared to mobile banking, as well as the lower trust levels that some respondents expressed regarding non-bank mobile money operators.

Hypothesis Four ($H0_4$): Online Lending Platforms and Financial Inclusion. Online lending platforms exerted a significant positive effect on financial inclusion (β = 0.213, t = 2.878, p < 0.01), resulting in the rejection of H04. This finding is among the most practically significant of the study, as it establishes that small business owners who access credit through digital lending platforms, including Carbon (formerly Paylater), FairMoney, Branch, Aella Credit, and QuickCredit, achieve significantly higher financial inclusion outcomes, particularly on the credit access dimension of inclusion that formal bank lending has historically failed to serve for this demographic. The finding is consistent with Aina (2025), who found that online lending platforms offered significant potential for addressing credit exclusion among Nigerian SMEs through algorithmic creditworthiness assessment. The finding also aligns with Sanga and Aziakpono (2023), who identified digital lending as among the most effective FinTech channels for expanding SME financial inclusion in Africa. The smallest coefficient among the four channels (β = 0.213) likely reflects the documented challenges of high interest rates, aggressive collection practices, and data privacy concerns associated with some online lenders in Nigeria, which may discourage sustained adoption and thereby limit the full financial inclusion potential of this channel (Aina, 2025; Nwankwo & Emeka, 2023).

Table 5: Summary of Hypothesis Testing Results

Hypothesis	FinTech Channel	β Coefficient	p-value	Decision
H01	Mobile Banking → Financial Inclusion	0.327	0.000***	Rejected - significant positive effect
H02	Digital Payment Platforms → Financial Inclusion	0.291	0.000***	Rejected - significant positive effect
H03	Mobile Money Services → Financial Inclusion	0.248	0.001***	Rejected - significant positive effect
H04	Online Lending Platforms → Financial Inclusion	0.213	0.004***	Rejected - significant positive effect

*Note: *** p < 0.01. Combined model: R^2 = 0.614; F = 60.473; p < 0.001. Source: Field Survey (2026).*

Conclusion and Recommendations

Summary of Findings

This study examined the effect of FinTech solutions on financial inclusion among 384 small business owners in Enugu Metropolis, Nigeria, using primary survey data collected through a structured questionnaire analysed via multiple regression. The findings consistently demonstrate that all four FinTech solution channels exert significant positive effects on financial inclusion. Mobile banking emerged as the strongest predictor ($\beta = 0.327$, $p < 0.001$), followed by digital payment platforms ($\beta = 0.291$, $p < 0.001$), mobile money services ($\beta = 0.248$, $p < 0.001$), and online lending platforms ($\beta = 0.213$, $p < 0.01$). The combined model was highly significant ($F = 60.473$, $p < 0.001$) and explained 61.4% of the variance in financial inclusion outcomes. All four null hypotheses were rejected, confirming that FinTech solutions are meaningful and significant drivers of financial inclusion among small business owners in Enugu Metropolis.

Theoretical Contributions

This study makes three theoretical contributions. First, it validates the joint application of Diffusion of Innovations Theory (Rogers, 2003) and Technology Acceptance Model (Davis, 1989) as an integrated theoretical framework for understanding FinTech-driven financial inclusion in the Nigerian small business context, confirming that both macro-level diffusion dynamics and individual-level perceived usefulness and ease of use are relevant in explaining FinTech adoption-inclusion outcomes. Second, the study contributes to the growing literature on FinTech solutions and financial inclusion in urban-secondary Nigerian contexts, providing the first multi-channel empirical analysis of FinTech-inclusion relationships specific to Enugu Metropolis small business owners. Third, by establishing a clear hierarchy of FinTech channel effects (MB > DPP > MMS > OLP), the study provides a theoretically and empirically grounded framework for prioritizing FinTech channel investment in strategies aimed at maximizing financial inclusion among small business owners in comparable Nigerian urban markets.

Policy Recommendations

Based on the study findings, the following recommendations are offered to key stakeholders:

First, the Central Bank of Nigeria (CBN) should accelerate the implementation of its National Financial Inclusion Strategy (NFIS) targets specifically for MSMEs by mandating commercial banks to develop simplified, low-cost mobile banking products tailored to the transaction patterns and capacity constraints of small business owners. Given that mobile banking is the strongest predictor of financial inclusion in this study, targeted mobile banking product design for small businesses should be prioritized.

Second, FinTech companies and digital payment platform operators, including Flutterwave, Paystack, Interswitch, OPay, and PalmPay, should deepen their presence in Enugu Metropolis commercial markets by subsidizing POS terminal deployment costs, reducing merchant transaction fees, and investing in digital payment literacy programs targeting small business owners in collaboration with market associations such as the Ogbete Main Market Traders' Association.

Third, mobile money operators (MMOs), particularly MTN MoMo and Airtel Money, should expand their agent banking networks in Enugu Metropolis secondary markets and residential areas. The lower adoption rate of mobile money compared to mobile banking (48.7% vs. 66.4%) suggests that market penetration strategies focused on agent visibility, trust-building, and transaction cost reduction would significantly increase adoption and the consequent financial inclusion benefits.

Fourth, the CBN and the Federal Competition and Consumer Protection Commission (FCCPC) should strengthen regulations governing online lending platforms operating in Nigeria, with specific focus on enforcing interest rate caps, prohibiting data harvesting for debt collection, and mandating transparent disclosure of total borrowing costs. The study's finding that online lending platforms recorded the lowest mean score and adoption rate among the four

channels reflects documented consumer distrust, regulatory action to address predatory lending practices would unlock greater inclusion potential from this channel.

Fifth, Enugu State Government through the Ministry of Commerce and Industry should integrate digital financial literacy into the capacity building programmes offered to small business owners through the Enugu State Enterprise Development Centre (EDC) and the Small and Medium Enterprises Development Agency of Nigeria (SMEDAN) state office. Given Nwankwo and Emeka's (2023) finding that financial literacy significantly moderates the FinTech-inclusion relationship, digital financial literacy training would amplify the inclusion effects of all four FinTech channels.

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