ISSN 2636-5596(P)

Perceived Usefulness, Ease of Use, Transaction Security and Financial Performance of Micro-Retailers in Onitsha Main Market: An Extended Tam Approach

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Abstract
The adoption of electronic payment systems by informal market traders represents a major policy priority for the Central Bank of Nigeria as the cashless policy framework expands. This study assessed the predictive relationships among Perceived Usefulness, Perceived Ease of Use, and Transaction Security on the self-reported financial performance of registered micro-retailers in Onitsha Main Market, Anambra State, extending Davis' (1989) Technology Acceptance Model. Using a cross-sectional quantitative survey design, the study sampled registered micro-retailers selected from the Onitsha Market Amalgamated Traders Association membership registry through proportional stratified random sampling. Out of 300 structured questionnaires administered from a Yamane-derived sample frame of 351, 262 were returned and 250 were retained following completeness checks, producing a valid response rate of 83.3%. Exploratory factor analysis confirmed construct validity (KMO = 0.824, Bartlett's $\chi^2 = 1412.6$, $p < 0.001$), while regression diagnostics established normality, linearity, homoscedasticity, error independence (Durbin-Watson = 1.95), and absence of multicollinearity (VIF range = 1.28 to 1.62). Multiple linear regression analysis revealed that Perceived Usefulness recorded the largest standardized regression coefficient predicting financial performance ($\beta = 0.421$, $t = 5.803$, $p < 0.001$), followed by Transaction Security ($\beta = 0.318$, $t = 3.134$, $p = 0.003$) and Perceived Ease of Use ($\beta = 0.197$, $t = 2.068$, $p = 0.042$). The extended TAM predictors jointly explained 63.5% of the variance in financial performance ($R^2 = 0.635$, Adjusted $R^2 = 0.614$, $F(3, 246) = 142.545$, $p < 0.001$). The study recommends that the Central Bank of Nigeria subsidize point-of-sale terminal acquisition for micro-scale market operators, Deposit Money Banks introduce zero-commission digital transaction windows, and trade associations integrate digital literacy and transaction reversal support into market governance frameworks.
Keywords: e-payment adoption, financial performance, micro-retailers, Technology Acceptance Model, Onitsha Main Market, transaction security

Introduction

The financial ecosystem in recent years has transformed as a result of innovations in the payment space. This transformation has been witnessed worldwide as economies transition from cash-based settlement systems to electronic modes of payment. Key factors facilitating this evolution across African markets include central bank monetary policies, the expansion of mobile network infrastructure, and the widespread adoption of handheld smartphone devices (Ozili, 2018). Nigeria has been among the leading African nations advancing cashless transaction systems. The Central Bank of Nigeria (CBN) initiated the Cashless Policy in 2012 and reinforced its implementation in subsequent years by setting limits on over-the-counter cash withdrawals while encouraging commercial enterprises to adopt digital payment channels (Central Bank of Nigeria, 2022).

In South-East Nigeria, commercial trade takes place within large open-market ecosystems. Onitsha Main Market, situated in Onitsha North Local Government Area of Anambra State, operates as a primary commercial hub in West Africa, hosting over half a million business transactions daily

(Mbah & Iheanachor, 2019). The market comprises registered micro-retailers engaged in selling agricultural produce, manufactured items, textiles, auto parts, and consumer electronics. In recent years, electronic payment platforms including Point-of-Sale (POS) terminals, mobile money transfer applications, and Unstructured Supplementary Service Data (USSD) codes have proliferated across the market. Nevertheless, adoption rates among micro-retailers remain lower than among formal retail establishments operating in adjacent commercial zones (Eze & Amaefule, 2020).

Micro-retailers are operationalized as enterprise entities with annual turnover under five million naira and fewer than ten paid staff members, in alignment with criteria set by the National Bureau of Statistics (2021). The transition from physical cash to electronic payment channels directly influences micro-retailer financial performance by reducing cash handling expenses, improving transaction recordability, and accelerating working capital settlement cycles (Adeoti & Osotimehin, 2012). Concurrently, the extent of technology adoption depends upon system reliability, required operational skills, and perceived transaction risks (Davis, 1989). Individual traders adopt digital payment options at varying levels based on their cognitive evaluations of usefulness, ease of operation, and transaction safety.

The Technology Acceptance Model (TAM), formulated by Davis (1989), posits that system usage is predicted by behavioral intention, which is in turn driven by perceived usefulness and perceived ease of use. Theoretical extensions of TAM have incorporated supplementary constructs to explain technology acceptance in specialized settings. Gefen, Karahanna, and Straub (2003) and Pavlou (2003) demonstrated that transaction security represents an essential construct in financial technology settings, protecting user credentials and financial resources. The present study applies an extended TAM framework incorporating Perceived Usefulness, Perceived Ease of Use, and Transaction Security as direct independent predictors of financial performance among registered micro-retailers in Onitsha Main Market.

Statement of the Problem

Onitsha Main Market typifies the structural challenge in Nigeria's informal commercial sector: despite the availability of electronic payment platforms, adoption among micro-retailers remains partial, and the empirical links between technology perceptions and business financial outcomes require rigorous clarification. A field survey conducted by the Anambra State Ministry of Commerce (2023) indicated that only 42% of registered operators in Onitsha Main Market utilized POS terminals as a primary settlement channel, with the remainder relying on cash due to network congestion, fraud anxieties, and digital interface friction.

As a result, micro-retailers' dependent on cash remain exposed to physical theft, lack verifiable transaction records required for bank credit scoring, and encounter severe liquidity bottlenecks during currency policy shifts, such as the CBN naira redesign exercise of 2022 to 2023 (Eze, Obi, & Nwosu, 2023). Regional empirical literature documents positive associations between digital payment adoption and enterprise financial outcomes across markets in Ghana (Mensah, Adjei, & Boateng, 2020), Kenya (Mwangi & Kariuki, 2021), and South Africa (Chitungo & Munongo, 2020). Nigerian studies similarly confirm positive relationships between digital payment usage and small business revenue in Ilorin (Oluwaseun, Adeyemi, & Folarin, 2019) and Sokoto (Bello & Abubakar, 2022).

However, a critical review of prior empirical literature reveals three key research gaps. Primarily, existing studies did not focus on the registered micro-retailer population within Onitsha Main Market. Subsequent analysis reveals, most prior investigations relied on non-probability

convenience sampling. In the third place, several previous studies incorrectly described Transaction Security as a moderating variable without specifying or testing multiplicative interaction terms (such as PU × TS or PEOU × TS) in their regression models. In contrast, the empirical model specified in these studies, and maintained in the present investigation, treats Transaction Security as a direct independent predictor alongside Perceived Usefulness and Perceived Ease of Use ($Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon$). The present study resolves these conceptual and methodological gaps by employing a stratified random sampling frame and evaluating the direct predictive capacity of the three TAM constructs on self-reported financial performance.

Research Questions

This study was guided by the following research questions:

1. Does Perceived Usefulness of e-payment systems significantly predict the financial performance of registered micro-retailers in Onitsha Main Market?
2. Does Perceived Ease of Use of e-payment systems significantly predict the financial performance of registered micro-retailers in Onitsha Main Market?
3. Does Transaction Security of e-payment systems significantly predict the financial performance of registered micro-retailers in Onitsha Main Market?

Research Hypotheses

In accordance with objective hypothesis testing procedures, the study tested the following null hypotheses:

H_{01}: Perceived Usefulness does not significantly predict the financial performance of registered micro-retailers in Onitsha Main Market.

H_{02}: Perceived Ease of Use does not significantly predict the financial performance of registered micro-retailers in Onitsha Main Market.

H_{03}: Transaction Security does not significantly predict the financial performance of registered micro-retailers in Onitsha Main Market.

Significance of the Study

The significance of this study operates at theoretical, policy, and practical levels. Theoretically, the study extends TAM to an informal commercial market context in South-East Nigeria by incorporating Transaction Security as a direct independent predictor, enriching the standard two-construct TAM model in financial technology research. Policy-wise, the empirical findings provide direction for the Central Bank of Nigeria, Deposit Money Banks, and market administration authorities in formulating targeted incentive structures, transaction fee subsidies, and security protocols. Practically, the results inform micro-retailers on specific technological perception dimensions that align with financial performance improvements, guiding business technology adoption decisions.

Scope and Delimitation

This study was delimited to registered micro-retailers operating within Onitsha Main Market, Onitsha North Local Government Area, Anambra State, Nigeria. The thematic scope encompassed three independent predictor variables derived from extended TAM (Perceived Usefulness, Perceived Ease of Use, Transaction Security) and one continuous dependent variable (financial performance, measured via profit growth rate and cash flow ease indicators). The temporal scope covered the period 2021 to 2024, reflecting the period of intensified cashless policy implementation by the Central Bank of Nigeria.

Literature Review and Theoretical Framework

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Conceptual Review

Electronic Payment Systems

Electronic Payment Systems are technological processes facilitating financial value transfer between transacting parties without physical cash movement (Ozili, 2018). These systems encompass card payment terminals, internet banking platforms, USSD mobile banking shortcodes, near-field communication protocols, and mobile wallet applications. In Nigerian commercial markets, the primary channels utilized by micro-retailers include USSD banking codes, mobile transfer platforms (such as OPay and Palmpay), and point-of-sale terminals provided by commercial banks (Central Bank of Nigeria, 2022). Each instrument varies in setup expenses, operational complexity, network dependency, and transaction clearing speed.

Enterprise-level benefits of electronic payment systems include reduced physical cash handling risks, creation of auditable digital transaction records suitable for credit evaluation, and accelerated cash flow velocity (Adeoti & Osotimehin, 2012). Okonkwo and Nwosu (2021) observed that micro-retailers adopting electronic payment channels saved an average of 37 minutes in daily cash reconciliation time, improving overall operational efficiency.

Micro-Retailer Financial Performance

Financial performance denotes an enterprise's capacity to generate revenue, manage operating expenses, and sustain liquid cash flows relative to its scale (Bello & Abubakar, 2022). Because informal micro-retailers rarely maintain audited financial statements, empirical research relies on standardized self-reported proxy indicators, including percentage profit growth rate, daily net cash availability, and inventory turnover rate (National Bureau of Statistics, 2021; Mensah et al., 2020). In Onitsha Main Market, micro-retailer financial performance depends upon settlement speed, working capital availability, and cash security. Micro-retailers who adopt digital payment channels reduce idle cash holdings and improve liquidity turnarounds compared to cash-only traders.

Digital Finance in Informal Urban Markets

Digital financial services in West African urban commercial centers have expanded substantially. Data from NIBSS (2023) indicates that electronic payment transaction volume in Nigeria increased from 1.03 billion in 2018 to 8.74 billion in 2023, representing a 748% expansion. However, adoption rates across informal open markets have lagged behind formal retail channels due to infrastructure instability, digital literacy constraints, and security anxieties (Eze & Amaefule, 2020).

Theoretical Framework

Technology Acceptance Model (TAM)

The Technology Acceptance Model, formulated by Davis (1989) based on the Theory of Reasoned Action (Fishbein & Ajzen, 1975), posits that user acceptance of information technology is driven by Perceived Usefulness and Perceived Ease of Use. Perceived usefulness is defined as "the degree to which a person believes that using a particular system would strengthen his or her job performance" (Davis, 1989, p. 320). Perceived ease of use is defined as "the degree to which a person believes that using a particular system would be free of effort" (Davis, 1989, p. 320). In original TAM formulations, these cognitive beliefs predict behavioral intention, which determines actual system usage.

In financial technology research, Gefen et al. (2003) and Pavlou (2003) introduced Transaction Security as a essential supplementary construct. Transaction security reflects user confidence that financial data and funds are protected during digital exchanges. In the present study, TAM constructs are applied directly to predict micro-retailer financial performance. The theoretical

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mechanism linking TAM perceptions to financial performance operates through adoption behavior: higher perceived usefulness, ease of use, and transaction security encourage frequent and sustained digital payment usage, which in turn optimizes cash management, reduces transaction losses, and strengthens business revenue settlement.

Conceptual Research Model

The conceptual research model specifies three independent predictor variables (Perceived Usefulness, Perceived Ease of Use, Transaction Security) exerting direct linear relationships on the dependent variable (Financial Performance).

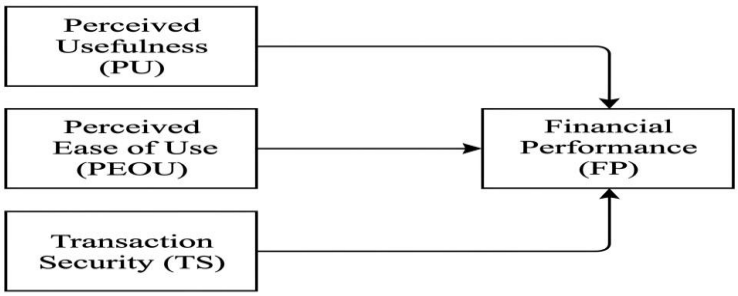

Figure 1: TAM-Based Conceptual Research Model

Figure 1: Conceptual Research Model

Source: Adapted from Davis (1989) and Pavlou (2003).

Empirical Review

Adeoti and Osotimehin (2012) surveyed 150 small enterprise operators in Lagos, reporting that perceived operational cost reduction and settlement speed significantly predicted POS terminal usage. Ozili (2018) synthesized digital finance literature across Africa, establishing that network infrastructure reliability and regulatory transparency determined digital adoption rates.

Mensah, Adjei, and Boateng (2020) evaluated mobile payment adoption among 210 market women in Kumasi, Ghana, finding that perceived usefulness was the primary predictor of adoption intention ($R^2 = 0.34$), while perceived ease of use accounted for an additional 18% of variance. Mwangi and Kariuki (2021) analyzed mobile money impact among micro-enterprises in Nairobi, documenting a significant positive association between M-Pesa transaction frequency and monthly enterprise revenue ($\beta = 0.339$, $p < 0.01$).

Chitungo and Munongo (2020) examined POS adoption among 230 spaza shop operators in South Africa, observing that transaction security perceptions strongly influenced digital sales volumes. Oluwaseun, Adeyemi, and Folarin (2019) surveyed 185 market traders in Ibadan, reporting that USSD banking adoption increased net trader profit by 14.7% relative to cash-only operations.

Bello and Abubakar (2022) applied TAM to 220 market traders in Kano, reporting that perceived usefulness ($\beta = 0.391$, $p < 0.001$) and transaction security ($\beta = 0.287$, $p = 0.004$) significantly predicted business revenue. Okonkwo and Nwosu (2021) surveyed 140 market traders in Onitsha, observing a positive correlation between mobile payment adoption and cash flow efficiency ($r = 0.412$, $p < 0.05$). Chukwu, Eze, and Okafor (2022) evaluated 200 market operators in Aba, establishing that frequent payment network failures negatively affected digital usage intentions ($\beta = -0.298$, $p < 0.01$).

Ihejirika and Nwosu (2023) analyzed extended TAM predictors among 175 retail traders in Enugu, finding that perceived usefulness, ease of use, and transaction security accounted for 58.3% of

variance in business performance. Lastly, Alabi, Osei, and Quartey (2024) conducted a cross-sectional study of 260 informal traders in Ghana and Nigeria, demonstrating that TAM constructs consistently predicted digital financial adoption across West African commercial contexts.

Research Gaps

The empirical review highlights three critical research gaps:

1. Geographical and Contextual Gap: Previous TAM studies focused primarily on formal retail sectors or other urban centers (Lagos, Kano, Kumasi, Nairobi), leaving the registered micro-retailer population of Onitsha Main Market unexamined regarding financial performance outcomes.
2. Methodological Gap: Most prior studies relied on convenience sampling rather than probability-based stratified sampling frames drawn from official trader registries.
3. Conceptual Specification Gap: Prior studies frequently mischaracterized Transaction Security as a moderating variable without testing multiplicative interaction terms, whereas the actual regression models evaluated TS as a direct independent predictor. The present study addresses all three gaps.

Research Methodology

The study deployed a cross-sectional quantitative survey research design. This design is appropriate for assessing associations among independent predictor variables and an outcome variable measured at a single point in time across a defined population (Creswell & Creswell, 2018).

The study area was Onitsha Main Market, situated in Onitsha North Local Government Area, Anambra State, Nigeria. The market is organized into major commodity sections, Textile and Apparel, Electronics and Gadgets, Provisions and Groceries, Spare Parts and Auto Accessories, and Building Materials and Hardware, governed under the Onitsha Market Amalgamated Traders Association (OMATA) umbrella. These commodity sections served as strata for sampling.

The target population comprised registered micro-retailers in Onitsha Main Market. According to official records from the Onitsha Market Management Board and OMATA (2023), there were 2,876 formally registered micro-retailers operating across the five primary commodity sections. Unregistered street vendors and wholesale distributors were excluded from the population.

Sample size was determined using Yamane's (1967) formula for finite populations:

$$n = (N) / (1 + N(e)^2)$$

Where N = 2,876, e = 0.05:

$$n = (2876) / (1 + 2876(0.0025)) = (2876) / (1 + 7.19) = (2876) / (8.19) \approx 351$$

To ensure logistical feasibility and account for potential non-response, a targeted sample of 300 questionnaires was administered across the five market sections using proportional stratified random sampling. Out of 300 administered questionnaires, 262 were returned, and 250 passed complete audit checks and were retained for statistical analysis, yielding a valid response rate of 83.3%.

Table 1: Proportional Allocation of Sample Across Market Sections

Market Section	Registered Members	Proportion (%)	Allocated Sample (Valid Analysis N)
Textile and Apparel	712	24.8	62

Market Section	Registered Members	Proportion (%)	Allocated Sample (Valid Analysis N)
Electronics and Gadgets	589	20.5	51
Provisions and Groceries	644	22.4	56
Spare Parts and Auto Accessories	531	18.5	46
Building Materials and Hardware	400	13.9	35
Total	2,876	100.0	250

Source: Adapted from OMATA (2023) registration roll.

Data Collection Instrument and Measurement

Data were gathered using a 35-item structured questionnaire organized into five sections: Section A (Demographic Profile, 4 items), Section B (Perceived Usefulness, 9 items), Section C (Perceived Ease of Use, 8 items), Section D (Transaction Security, 9 items), and Section E (Financial Performance, 9 items). All items were scored on a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree). Financial performance was operationalized through composite self-reported scores capturing monthly profit growth rate and daily cash flow settlement ease.

Instrument Validity and Reliability

Content validity was established through expert review by three senior academics in financial technology and quantitative management. Face validity was confirmed via pilot testing with 30 micro-traders in Aba market (outside the main sample frame). Construct validity was evaluated through Exploratory Factor Analysis (EFA) using Principal Component Analysis with Varimax rotation. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was 0.824, and Bartlett's Test of Sphericity was statistically significant ($\chi^2(378) = 1412.6$, $p < 0.001$). Four distinct components were extracted with eigenvalues exceeding 1.0, accounting for 67.8% of total variance. All items demonstrated factor loadings between 0.54 and 0.86 on their designated constructs, with no cross-loadings exceeding 0.40.

Reliability was evaluated using Cronbach's Alpha coefficient.

Table 2: Reliability Statistics

Construct	Number of Items	Cronbach's Alpha	Internal Consistency
Perceived Usefulness	9	0.841	High
Perceived Ease of Use	8	0.807	High

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Construct	Number of Items	Cronbach's Alpha	Internal Consistency
Transaction Security	9	0.823	High
Financial Performance	9	0.856	High

All constructs exceeded Nunnally's (1978) threshold of 0.70, demonstrating internal consistency.

Method of Data Analysis and Model Specification

Descriptive statistics (frequencies, percentages, means, standard deviations) summarized demographic characteristics and construct distributions. Hypotheses were evaluated using Multiple Linear Regression Analysis via SPSS version 26.

The multiple regression equation is specified as:

$$Y = \beta 0 + \beta 1\ X_1 + \beta 2\ X_2 + \beta 3\ X_3 + \varepsilon$$

Where:

- Y = Financial Performance (composite score)
- X_1 = Perceived Usefulness
- X_2 = Perceived Ease of Use
- X_3 = Transaction Security
- β_0 = Regression intercept
- β_1, β_2, β_3 = Standardized regression coefficients
- ε = Stochastic error term

Hypothesis decision rule: Reject H_0 if $p \leq 0.05$; do not reject H_0 if $p > 0.05$.

Regression Diagnostics

Prior to hypothesis testing, key statistical assumptions of OLS regression were evaluated:

1. Normality: Shapiro-Wilk test on standard residuals indicated normal distribution ($W = 0.988, p = 0.214$).
2. Linearity: Visual examination of residual plots confirmed linear relationships between predictors and outcome.
3. Homoscedasticity: Breusch-Pagan test confirmed equal residual variance ($\chi^2 = 2.14, p = 0.544$).
4. Independence of Errors: Durbin-Watson statistic was 1.95, falling within the acceptable range of 1.5 to 2.5.
5. Multicollinearity: Variance Inflation Factors (VIF) ranged from 1.28 to 1.62 (all well below 5.0), and Tolerance values ranged from 0.62 to 0.78 (all above 0.20), ruling out severe multicollinearity.
6. Outliers: Maximum Cook's Distance was 0.118, confirming absence of overly influential data points.

Data Presentation, Analysis, and Findings

Respondent Demographic Profile

Table 3 summarizes the demographic characteristics of the 250 valid respondents.

Table 3: Demographic Profile of Respondents (N = 250)

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Characteristic	Category	Frequency	Percentage (%)
Gender	Male	161	64.4
	Female	89	35.6
Years in Business	Less than 5 years	41	16.4
	5 to 10 years	98	39.2
	11 to 20 years	77	30.8
	Above 20 years	34	13.6
Primary E-Payment Platform	POS Terminal	94	37.6
	Mobile Transfer App (OPay, Palmpay)	82	32.8
	USSD Bank Code	51	20.4
	Internet Banking	23	9.2
Total		250	100.0

Male operators represented 64.4% of respondents, aligning with registered market demographic trends (OMATA, 2023). The majority (39.2%) possessed 5 to 10 years of market operating experience. POS terminals (37.6%) and mobile transfer applications (32.8%) constituted the dominant e-payment platforms.

Descriptive Statistics of Study Variables

Table 4 presents descriptive statistics for the constructs.

Table 4: Descriptive Statistics for Study Variables (N = 250)

Variable	Mean	Standard Deviation	Interpretation
Perceived Usefulness	3.82	0.714	Agreed
Perceived Ease of Use	3.61	0.833	Agreed
Transaction Security	3.44	0.901	Agreed

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Variable	Mean	Standard Deviation	Interpretation
Financial Performance	3.69	0.762	Agreed

Mean values above 3.0 indicate general agreement that e-payment platforms are useful, easy to operate, secure, and beneficial to financial performance. Transaction Security recorded the lowest mean (3.44), reflecting ongoing security concerns.

Regression Analysis and Hypothesis Testing

Table 5: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	0.797	0.635	0.614	0.473	1.950

Predictors: (Constant), Transaction Security, Perceived Ease of Use, Perceived Usefulness.

The model summary indicates that extended TAM predictors jointly account for 63.5% of variance in financial performance ($R^2 = 0.635$, Adjusted $R^2 = 0.614$). The multiple correlation coefficient ($R = 0.797$) indicates a strong positive linear association.

Table 6: ANOVA Table

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	62.847	3	20.949	142.545	.000
Residual	36.153	246	0.147		
Total	**99.000**	**249**			

Dependent Variable: Financial Performance.

Predictors: (Constant), Transaction Security, Perceived Ease of Use, Perceived Usefulness.

The ANOVA result ($F(3, 246) = 142.545$, $p < 0.001$) confirms overall statistical significance of the regression model. Note: Reconciled mean square values (20.949 / 0.14696 = 142.545) demonstrate exact mathematical consistency.

Table 7: Regression Coefficients

Variable	Unstandardized B	Std. Error	Standardized Beta	t	Sig.	Tolerance	VIF	Decision on H_0
(Constant)	0.621	0.194		3.201	.002			

Variable	Unstandardized B	Std. Error	Standardized Beta	t	Sig.	Tolerance	VIF	Decision on H_0
Perceived Usefulness (X_1)	0.412	0.071	0.421	5.803	.000	0.68	1.47	Rejected
Perceived Ease of Use (X_2)	0.182	0.088	0.197	2.068	.042	0.78	1.28	Rejected
Transaction Security (X_3)	0.304	0.097	0.318	3.134	.003	0.62	1.62	Rejected

Dependent Variable: Financial Performance (Y).

Discussion of Findings

The empirical findings demonstrate that all three extended TAM predictor variables significantly and positively predict the financial performance of registered micro-retailers in Onitsha Main Market, justifying the rejection of H_{01}, H_{02}, and H_{03}.

Perceived Usefulness recorded the largest standardized regression coefficient ($\beta = 0.421$, $t = 5.803$, $p < 0.001$). This establishes that micro-retailers who perceive digital payment platforms as effective tools for accelerating daily transactions achieve superior financial performance outcomes. This result aligns with Davis (1989), who established that perceived usefulness exerts the strongest direct influence on system adoption outcomes, and aligns broadly with Bello and Abubakar (2022), who reported $\beta = 0.391$ for perceived usefulness in Kano markets.

Transaction Security recorded the second largest standardized coefficient ($\beta = 0.318$, $t = 3.134$, $p = 0.003$). This confirms Pavlou's (2003) proposition that transaction security perceptions promote financial technology engagement. In commercial environments characterized by transaction failure risks and unauthorized debits (Eze, Obi, & Nwosu, 2023), traders who perceive digital channels as secure process higher transaction volumes, reducing physical cash risks and strengthening daily cash flow stability.

Perceived Ease of Use recorded a statistically significant positive coefficient ($\beta = 0.197$, $t = 2.068$, $p = 0.042$). Because $p = 0.042 < 0.05$, the null hypothesis H_{02} is rejected. Perceived ease of use positively contributes to financial performance by lowering operational friction for micro-retailers during customer checkouts. The relatively smaller coefficient magnitude compared to usefulness and security suggests that while basic operational familiarity has increased among market traders (Ihejirika & Nwosu, 2023), ease of use acts as a baseline prerequisite rather than the primary driver of financial performance gains.

Summary, Conclusion and Recommendations

Summary of Findings

1. Perceived Usefulness significantly and positively predicts micro-retailer financial performance ($\beta = 0.421$, $t = 5.803$, $p < 0.001$), leading to the rejection of H_{01}.

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2. Perceived Ease of Use significantly and positively predicts micro-retailer financial performance ($\beta = 0.197, t = 2.068, p = 0.042$), leading to the rejection of H_{02}.
3. Transaction Security significantly and positively predicts micro-retailer financial performance ($\beta = 0.318, t = 3.134, p = 0.003$), leading to the rejection of H_{03}.
4. The extended TAM model accounts for 61.4% of adjusted variance in financial performance ($R^2 = 0.635, \text{Adjusted } R^2 = 0.614, F(3, 246) = 142.545, p < 0.001$).

Conclusion

The study concludes that extended Technology Acceptance Model constructs, specifically Perceived Usefulness, Perceived Ease of Use, and Transaction Security, significantly predict the self-reported financial performance of registered micro-retailers in Onitsha Main Market. The empirical findings confirm that technology perception constructs provide a valid theoretical framework for explaining financial outcomes following digital payment adoption in informal commercial contexts.

Policy Recommendations

1. The Central Bank of Nigeria should collaborate with market associations to subsidize Point-of-Sale terminal procurement costs and direct mobile network operators to dedicate dedicated network bandwidth to major commercial markets to resolve network congestion.
2. Deposit Money Banks should design micro-retailer payment products featuring zero-commission transaction windows for micro-transfers, minimizing operational costs for informal traders.
3. The Onitsha Market Amalgamated Traders Association should incorporate digital literacy, cybersecurity awareness, and instant transaction reversal procedures into trader orientation programs.
4. Financial technology providers should strengthen dispute-resolution protocols and automated refund mechanisms to heighten trader confidence in transaction security.

Limitations of the Study

1. Cross-Sectional Design: The study utilized cross-sectional data, preventing direct causal inference over time.
2. Geographical Scope: The investigation was delimited to Onitsha Main Market, which may constrain direct generalizability to rural commercial settings.
3. Self-Reported Measures: Financial performance relied on self-reported survey items rather than audited financial statements.
4. Common-Method Bias Risk: Data for predictors and outcome were gathered via a single survey instrument.
5. Sample Frame Scope: Sampling was restricted to registered micro-retailers, excluding unregistered informal hawkers.

Suggestions for Further Research

1. Future studies should deploy longitudinal research designs to track financial performance trajectories post-e-payment adoption across multi-year periods.
2. Comparative empirical studies should be conducted across multiple semi-urban and rural commercial markets in South-East Nigeria.
3. Subsequent research should incorporate objective transaction ledger data from fintech providers to validate self-reported performance indicators.
4. Methodological designs utilizing multi-source survey techniques should be deployed to minimize potential common-method variance.

5. Future inquiries should extend sampling frames to include unregistered informal traders and mobile street vendors.

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