FINANCIAL TECHNOLOGY AND CUSTOMER RETENTION IN NIGERIAN BANKS

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Keywords

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Abstract

Research Problem: *Nigerian banks continue to experience persistent customer retention challenges despite significant investments in financial technology (FinTech) and service innovation such as mobile banking, internet banking, Automated Teller Machines (ATMs), and Point-of-Sale (POS) systems.*

Methods/Theory: *The study utilized quarterly secondary data obtained from the Central Bank of Nigeria (CBN) Statistical Bulletin and the Nigerian Deposit Insurance Corporation (NDIC) covering 2010-2024. Customer retention was proxied by total deposits in deposit money banks, while FinTech adoption was measured using ATMs, POS terminals, mobile banking and internet banking activities. The Autoregressive Distributed Lag (ARDL) model was employed to estimate short-run and long-run relationships. The study was underpinned by technology acceptance model (TAM).*

Results: *The findings reveal that, in the short run ATMs, internet banking and mobile banking exhibit significant positive effects, indicating their role in enhancing immediate customer satisfaction. However, in the long run, all FinTech variables have insignificant effects on customer retention, suggesting that digital channels alone are insufficient to sustain long-term loyalty in Nigeria.*

Conclusions: *The study concludes that financial technology improves short-term customer experiences but does not yet translate into sustained loyalty in the Nigerian banking sector.*

Key Contribution to Knowledge: *The study extends FinTech research beyond adoption and financial inclusion by empirically examining its long-run implications for relationship-based banking outcomes and customer retention in an emerging economy.*

Recommendations: *The study recommends that regulators, particularly the Central Bank of Nigeria (CBN), strengthen policies that encourage innovation while ensuring data protection and privacy, as consistent regulatory frameworks are essential for fostering trust in digital financial services.*

Introduction

The modern banking sector is increasingly confronted with the challenge of retaining customers in an environment characterized by rapidly evolving customer expectations, intense competition, service quality deficiencies, and limited personalization which collectively undermine customer retention and long-term customer relationships. However, innovation and adoption of financial technology has improved services delivery and customer experience. Consequently, Customer retention has becomes fundamental driver of profitability and sustainable competitiveness in the formal financial system. beyond encouraging repeat transactions, customer retention focuses on developing long-term relationships that foster stable revenue flows and organizational resilience as noted by Chinyere, Sabina and Chimaobi, (2021).

In recent years, the Nigerian banking sector has undergone profound transformation driven by advances in financial technology (fintech). In response to these retention challenges, banks across the world have increasingly turned to financial technology (FinTech) as a strategic tool for improving service delivery and enhancing customer experience.Globally, (Owusu, Agyei, &Amanor, 2019). The innovations of mobile and online banking, peer-to-peer lending, blockchain applications, robo-advisory systems, and digital payment sall of which simplify banking operations while improving customer experience. By leveraging fintech, banks can minimize manual processes, optimize workflows, and enhance user experience. In Nigeria, technological transformation in banking began with the introduction of Automated Teller Machines (ATMs) marked one of the earliest phases of technological transformation,iby enabling self-service operations such as withdrawals, transfers, and account inquiries without physical assistance (Abdulmumin, et al., , 2019; Ahamed&Mallick, 2019).

.Existing studies have largely examined the contribution of FinTech to financial inclusion, operational efficiency, and cost reduction within banking systems, particularly in developing economies where traditional banking infrastructure remains limited Olopade, et al., (2025). The outbreak of the COVID-19 pandemic further accelerated digital transformation, replacing traditional in-person interactions with digital channels and automated platforms (Feyen et al., 2021). As a result the adoption of Point of Sale (POS) terminals, ATMs, mobile banking, online transactions and other electronic banking channels has reshaped how customers engage with financial institutions. Consequently, as customers increasingly migrate to digital channels, conventional banking models face the risk of obsolescence (Hassan &Misrina, 2021).

However, despite the growing body of literature on FinTech adoption and financial inclusion, limited empirical attention has been given to understanding how these technological innovations influence customer retention, particularly within emerging banking markets such as Nigeria. Much of the existing research concentrates on technology adoption, usage patterns, or financial access indicators, while the long-term relational outcomes of digital transformation such as customer loyalty, relationship continuity, and retention sustainability remain insufficiently explored. This gap raises an important question as to whether FinTech innovations merely enhance transactional convenience or genuinely strengthen enduring customer–bank relationships. Accordingly, this study examines the influence of financial technology adoption on customer retention in Nigerian banks. . By shifting analytical attention from access and technology usage toward relationship-based banking outcomes, the study contributes to ongoing academic discussions on the strategic role of FinTech in promoting competitiveness,

profitability, and sustainable customer engagement within modern financial systems.

Statement of Research Problem

Nigerian banks continue to face persistent difficulties in retaining customers despite significant investments in digital financial technologies and service innovations. increasing customer expectation, intense competition, service quality deficiencies and inadequate personalization have weakened long-term customer relationships within the banking sector. Customer frequently report dissatisfaction resulting from long queues, insufficient customer service personnel, unprofessional staff attitudes, and weak information dissemination mechanisms system all of which undermine customer confidence and loyalty toward financial institutions.

Although, financial technology (FinTech) adoption has transformed banking operations through improved accessibility, automation, and digital service delivery, the integration of these technologies has introduced a new operational and strategic pressures. .Nigeria Banks is still facing a barriers including technological infrastructure deficits, cybersecurity threats, regulatory ambiguities, and organizational resistance to technological changes. . Meanwhile, fintech startup offer fasters, more innovation, and cost-effective services, intensifying competition and compelling traditional bank to rethink their approaches to customer retention (Banabo & Perearau, 2025).

In response, banks have deployed various digital platforms such as mobile banking, internet banking, Automated Teller Machines (ATMs), and Point-of-Sale (POS) systems to enhance convenience and strengthen customer engagement. However, the growing adoption of digital channels does not automatically guarantee sustained customer loyalty or relationship continuity. The critical issue confronting the Nigerian banking sector therefore lies in determining whether financial technology adoption merely improves transactional efficiency or genuinely enhances long-term customer retention.

Existing empirical studies on financial technology such as Torutein, (2025) and Okoro, et al., (2024) have largely concentrated on financial inclusion, operational efficiency, and digital adoption patterns, with limited attention devoted to understanding the relational outcomes of technological innovation. Consequently, insufficient empirical evidence exists regarding how specific fintech channels influence customer retention within Nigerian banks. This study, therefore, seeks to bridge this gap by empirically examining the impact of financial technology adoption on customer retention in Nigerian banks. Unlike previous studies that emphasize access and technology usage, this research views fintech innovation from a relationship-sustainability perspective, focusing on how digital banking platforms contribute to enhancing customer loyalty, strengthening institutional competitiveness, and promoting sustainable growth within an increasingly digital financial ecosystem.

Research Objective

i. To examine the effect of digital banking platforms (mobile banking, internet banking, ATM services, and POS systems) on customer retention in Nigerian banks.

ii. To evaluate how financial technology adoption influences long-term customer loyalty and relationship sustainability within the Nigerian banking sector.

Conceptual Clarification

Concept of Financial Technology

The concept of financial technology (fintech) evolved from the broader field of

information and communication technology (ICT) and its application within the financial sector. Both ICT and fintech represent rapidly advancing domains that have reshaped how organizations communicate, conduct business, and deliver services. According to Al-Amarneh, Yaseen, Atta, and Khalaf (2023) ICT provides the foundational infrastructure for data storage, processing, and communication. Fintech, specifically applies technological innovations to improve the provision of financial services.

Chishti and Barberis (2016) define fintech as the integration of modern technologies with existing business models to enhance competitiveness and efficiency within the financial marketplace traditionally dominated by banks and intermediaries. Similarly, Muttai, Njoka, and Muchira (2023) and Yua, Daniel, and Epor (2023) describe fintech as the use of digital tools to facilitate financial functions such as saving, investing, borrowing, transferring, and safeguarding money in more efficient ways than conventional methods.. These innovations encompass a wide range of services such as digital banking, peer-to-peer lending, electronic payments, robo-advisory investment platforms, and crowdfunding systems that simplify access to financial resources while minimizing operational costs. One of fintech's most significant contributions lies in its ability to broaden financial inclusion by extending services to unbanked and underbanked populations through mobile money and digital payment systems (Yua, Daniel, &Epor, 2023).

Yang, Li, Ma, and Chen (2018) emphasize that fintech has expanded financial accessibility for marginalized groups by providing alternative, technology-driven options such as mobile wallets. Moreover, fintech empowers individuals to better manage their finances by offering automated and personalized guidance. These technologies minimize the need for intermediaries, shorten processing times, and lower transaction fees benefiting both businesses and individual consumers engaged in global commerce.

Furthermore, the development of financial technology (fintech) in Nigeria can be traced to the early 2000s, following the introduction of mobile money services aimed at addressing the nation's persistent financial inclusion challenges. Early innovators such as Paga and Interswitch played a pioneering role by launching digital payment platforms that enabled Nigerians to transfer funds conveniently and securely through mobile devices. (Ozili, 2023).

In response to the growing relevance of digital finance, the Central Bank of Nigeria (CBN) and the federal government have implemented several strategic initiatives to foster innovation and inclusion. Notably, the National Financial Inclusion Strategy and the Cashless Policy were introduced to accelerate the adoption of digital financial services and reduce dependence on physical cash transactions (Diyaolu, Adeleke & Rasheed, 2022). These policy interventions have created a supportive regulatory framework, encouraging fintech startups to scale operations and develop technology-driven financial solutions tailored to local needs.

Despite these achievements, Nigeria's fintech sector still lags behind its global counterparts in terms of scale and technological advancement. Nonetheless, the country remains competitively positioned due to its expanding pool of skilled, cost-effective technology professionals and an increasing appetite for digital financial solutions. The growing acceptance of these innovations has positioned Nigeria as an emerging fintech hub in Africa and an attractive destination for international investment. Consequently, this study employs Automated Teller Machines (ATMs), Point of Sale (POS) terminals, and internet banking platforms as key proxies for measuring fintech adoption within the

Nigerian banking sector. These indicators are selected because they represent the most prevalent and impactful channels through which financial technology influences customer experience, service accessibility, and overall retention in the industry.

Customer Retention

Customer retention has emerged as a critical determinant of business sustainability and profitability in the modern competitive environment. According to the New Webster Dictionary (1994), retention refers to maintaining a customer within an exchange transaction or the act of being a regular patron of a business enterprise. In the context of banking, which is characterized by intense competition and increasingly sophisticated customer expectations, achieving and maintaining customer satisfaction has become a strategic necessity for ensuring customer loyalty and retention (Amadi, Anucha, & Uwabor, 2020). In Nigeria Customer retention represents a firm's ability to sustain long-term relationships with existing customers, ensuring their continued purchase of products and services while strengthening their commitment to the organization (Zhang et al., 2024). It extends beyond preventing customer churn; rather, it emphasizes cultivating loyalty and emotional attachment that contribute to a stable customer base and recurring revenue streams. Retention, therefore, is not merely a function of product quality or service delivery but a reflection of a company's capacity to create value that consistently meets or exceeds customer expectations (Afnen et al., 2023).

Scholars such as Ogunnaike and Ogbari, (2022) describe customer retention as a deliberate, strategic effort aimed at fostering ongoing relationships with customers through value creation, personalized service delivery, and memorable brand experiences. This approach underscores the shift from transactional marketing to relationship marketing, where the primary goal is to maintain enduring, mutually beneficial connections rather than short-term sales.

In today's highly dynamic and digitalized financial landscape, customer retention involves more than repeat patronage; it reflects the establishment of trust, satisfaction, and emotional engagement that influence customers' willingness to continue interacting with a firm over time. Kwon, Molyneux, Pancotto, and Reghezza, (2023) emphasizes that true retention strategies focus on building long-term partnerships by ensuring customers derive continuous satisfaction and perceive sustained value from their relationship with the organization.

Consequently, in the banking sector, customer retention is a vital measure of success as it determines a financial institution's ability to sustain profitability and competitive advantage. By maintaining strong, loyal customer relationships, banks can reduce marketing expenses associated with acquiring new clients while benefiting from positive word-of-mouth, repeat transactions, and enhanced customer lifetime value.this study employs total deposits of the deposit money bank has proxy to measure customers retention.

Theoretical Framework

The study adopt Technology Acceptance Model (TAM) to explained the influence of financial technology on customer retention with a focus on fintech innovation such as mobile/ internet banking, POS terminal and ATM deployment within Nigeria Context.

Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) developed by Davis (1989) provides a theoretical basis for understanding how customers adopt and continuously use new technologies, particularly in service-oriented industries like banking. Rooted in the theory

of reasoned action (Fishbein & Ajzen), TAM explains that users' acceptance of a technological system is primarily determined by two perceptions perceived usefulness and perceived ease of use. When customers find a financial technology platform both beneficial and simple to operate, their satisfaction and trust in the system grow, thereby increasing their likelihood of long-term usage and retention. In the banking sector, FinTech innovations such as mobile banking, digital payments, and online customer support have transformed the way clients interact with financial institutions.

The relevance of TAM theories to this study reveal that the influence of FinTech on customer retention in the banking industry lies in how effectively the technology balances functionality, user-friendliness, reliability, and social acceptance. When digital banking services meet these conditions, customers perceive greater value and are more likely to maintain long-term relationships with their banks.

However, while TAM has been widely used in explaining technology adoption, this study extends its application by shifting focus from initial acceptance to customer retention outcomes. Unlike previous studies that primarily examine whether users adopt FinTech systems, this research evaluates whether sustained use of these technologies translates into long-term customer loyalty and retention in the Nigerian banking sector

The study Therefore, extend TAM by applying it not only to explain technology adoption but also to understand customer retention. It argues that perceived usefulness and ease of use do not just influence initial acceptance of fintech services, but also shape whether customer continue using them and remain loyal to their banks overtime. In this way, the study links TAM more directly to customer retention in the Nigeria banking context, showing how digital banking experiences can influence long-term customer–bank relationships.

Empirical Framework: Financial Technology and Customer Retention in Banking

Empirical studies examining customer retention within the banking sector which have increasingly emphasized the importance of relationship management, service quality, and technological innovation as critical determinants of sustained customer–bank relationships

Akintunde and Akaighe (2016) explored the relationship between Customer Relationship Management (CRM) and customer retention within the Nigerian banking industry from a strategic perspective. Data were gathered using a structured questionnaire The study employed Pearson correlation analysis to test the relationship between the variables. The findings revealed a positive and significant association between CRM practices and customer retention levels. While this study confirms the strategic importance of relationship-based banking, its focus remains largely on traditional interpersonal interactions rather than digitally mediated relationships. As banking operations increasingly migrate toward technology-driven platforms, it becomes necessary to reassess whether technological channels can replicate or even strengthen the relational benefits previously achieved through conventional CRM practices..

Extending the discussion toward digital service delivery, Amadi, Anucha, and Uwabor (2020) investigated the relationship between internet banking service quality and customer retention among deposit money banks in Rivers State. The study utilized primary data obtained through a structured questionnaire, and the analysis was conducted using the Spearman's Rank (rho) correlation technique. The results demonstrated that customer

technology adoption significantly and positively moderates the relationship between the quality of internet banking services and customer retention. This implies that as customers become more technologically inclined, their satisfaction with internet banking services improves, leading to stronger loyalty and sustained patronage. However, the reliance on cross-sectional primary data limits the ability to determine whether such satisfaction persists over time. Consequently, although internet banking improves short-term engagement, the long-run sustainability of customer loyalty remains insufficiently addressed, thereby justifying further investigation using time-series evidence.

Similarly, Bankole, et al., (2020) investigated the effect of relationship management on customer retention within the banking sector, it demostrate that service quality, technology adoption, and effective complaint handling significantly influence customer retention in Nigerian banks. . data were analyzed using the Pearson Product-Moment Correlation technique. The findings revealed a argument that retention outcomes depend not only on technology availability but also on service experience surrounding technology usage. Nevertheless, the study adopts a localized case-study approach restricted to Akure Metropolis, which raises concerns regarding generalizability across the broader Nigerian banking system. This limitation highlights the need for macro-level empirical analysis capable of capturing nationwide technological banking trends.

Moreso, Adewumi and Ige (2023) examined how financial technology influences the performance of banking institutions in Nigeria. The study employed quarterly data spanning from 2012 to 2019, obtained from the Central Bank of Nigeria (CBN) payment system statistics and the financial statements of selected commercial banks. Using the Autoregressive Distributed Lag (ARDL) model, the authors found that FinTech innovations exert a positive and significant effect on both traditional and market-based performance indicators of Nigerian banks. While this evidence confirms the operational benefits of FinTech adoption for financial institutions, performance improvement does not automatically imply customer retention. Profitability gains may coexist with customer switching behavior, thereby leaving unanswered whether technological expansion translates into stable customer relationships.

Similarly, Okoro, et al., (2024) examined the impact of financial technology on the performance of financial institutions in Nigerian . Data were analyzed using multiple regression analysis. The results showed that ATM and POS transactions positively influence the performance of Nigerian commercial banks, whereas internet banking transactions exerted a negative effect. the study evaluates institutional liquidity rather than customer behavior, thereby creating a conceptual gap between technological deployment and relationship-based outcomes such as retention. Addressing this disconnect requires empirical analysis that directly links FinTech usage indicators to customer retention measures.

Consequently, Banabo and Perearau (2025) examined the influence of experiential marketing strategies on customer retention within financial technology banks in Yenagoa, Bayelsa State. The researchers employed a questionnaire-based survey as the primary method of data collection, while multiple regression analysis was utilized to examine the relationship between the study variables. The findings revealed that sensory, emotional, cognitive, relational, and behavioral marketing dimensions all have a positive and significant impact on customer retention among FinTech banks in the study area. However, the study relies exclusively on perception-based survey responses within a single geographic area,

thereby limiting longitudinal understanding of how digital experiences influence sustained banking relationships over time.

In a related study, Olopade, Akintan, and Jolaosho (2025) examined the relationship between technological innovation and customer patronage among selected deposit money banks in Abeokuta, Ogun State. . The study employed multiple regression analysis. The results revealed that technological innovations enhance service convenience and accessibility, which in turn foster customer satisfaction, trust, and loyalty within the banking industry. The study further emphasized that the adoption of digital technologies allows banks to improve operational efficiency, minimize transaction costs, and enhance competitiveness at both the national and global levels. Although customer patronage reflects positive behavioral response, it does not necessarily capture long-term loyalty or retention dynamics. Customers may frequently patronize digital services while still maintaining accounts with multiple banks, suggesting that patronage and retention are conceptually distinct outcomes requiring separate empirical examination.

Furthemore, Torutein (2025) investigated the role of financial technology in the performance of the Nigerian banking industry. Using the Autoregressive Distributed Lag (ARDL) model, the findings revealed that ATM, internet banking, and mobile banking services exerted negative effects on bank performance in Nigeria, whereas POS services showed a positive influence within the study period. These mixed results indicate that technological expansion may introduce operational risks, cybersecurity concerns, or cost pressures capable of offsetting expected performance gains. The implication is that technology adoption alone does not guarantee positive outcomes, thereby strengthening the need to investigate whether FinTech investments genuinely sustain customer relationships.

Finally, Isibor et al (2025) explored the influence of mobile banking on customer loyalty, satisfaction, and retention within Nigeria's banking sector. The study utilized questionnaires for data collection and employed Analysis of Variance (ANOVA) regression techniques for analysis. The results showed that mobile banking positively and significantly affects customer satisfaction, retention, and loyalty. While this study directly connects digital banking to retention outcomes, its reliance on perceptual survey data emphasizes attitudinal responses rather than actual behavioral retention measured over time. This methodological limitation underscores the importance of employing objective secondary data capable of capturing real customer retention patterns within the Nigerian banking industry. Although empirical studies collectively reviewed literature examining financial technology and banking outcomes, critical gaps remain regarding the ability of financial technology adoption to sustain customer retention within the Nigerian banking sector. Early, empirical investigations such as Akintunde and Akaighe (2016), Amadi et al. (2020), and Bankole et al. (2020), established that customer relationship management, service quality, and technology adoption improve customer satisfaction and loyalty. However, these studies largely reflect traditional service interaction perspectives or rely on cross-sectional perception data, leaving unanswered whether digitally mediated banking relationships can maintain retention over time.

More recent studies, including Adewumi and Ige (2023), Okoro et al. (2024), shifted attention toward financial technology adoption but focused mainly on institutional performance outcomes such as profitability, liquidity, and operational efficiency rather than customer retention behaviour. This creates a

conceptual disconnect because improved bank performance does not necessarily translate into sustained customer commitment. Similarly, Studies such as Olopade et al. (2025) measured customer patronage and service usage, which may indicate convenience but do not adequately capture long-term retention, particularly in an era where customers maintain multiple banking relationships... Furthermore, much of the existing literature examines individual digital channels or localized banking environments, limiting nationwide generalization and failing to capture how integrated financial technology platforms jointly influence retention outcomes. Even studies linking digital banking to retention rely predominantly on perception-based surveys rather than objective longitudinal evidence.. Consequently, empirical understanding of whether financial technology adoption genuinely strengthens enduring customer retention relationship in Nigeria remains incomplete. This study addresses this gap by examining how key financial technology channels Automated Teller Machines (ATM), Point of Sale (POS) systems, and internet banking influence customer retention in Nigerian banks over the period 2010-2024, thereby shifting the discourse from technology adoption and performance toward relationship sustainability

Methodology

Research Design

This study adopts an ex-post facto research design because it investigates the relationship between financial technology and customer retention in Nigerian banks using existing data obtained from secondary sources. The ex-post facto design is appropriate since the researcher cannot manipulate the independent variables (financial technology indicators) but can only observe their effects on the dependent variable (customer retention). This design is suitable for empirical studies that aim to establish the nature and significance of relationships among variables based on already-recorded events.

Sources of Data and Model specification

The study will rely solely on secondary data sourced from credible institutional publications such as the Central Bank of Nigeria (CBN) Statistical Bulletin, Nigerian Deposit Insurance Corporation (NDIC) quarterly Reports, covering the period 2009Q1–2024Q4. Additional data may be extracted from the National Bureau of Statistics (NBS) and published financial technology adoption records from the CBN payment system statistics.These sources offer thorough information on fintech, customer retention and pertinent control variables in Nigeria banking industry.

The empirical strategy of this study adopts and modifies the model of Isibor et al. (2025), who examined the relationship between mobile banking and customer satisfaction, retention, and loyalty in the Nigerian banking sector. However, the present study focuses exclusively on the customer retention component of their framework, as customer retention serves as a vital indicator of long-term customer relationship performance in the banking industry. Which was state:

$CR = (FinTech)$.....2

And disaggregated into:

$CR = (MB)$

Where,

$CR = \beta 0 + \beta 1\ MB + \varepsilon$

CR is Customer Retention, β0 being the constant, β1 being coefficients explaining the independent variable, MB = Mobile Banking, εt = Error term

In the present study, the model is modified for secondary data analysis to align with the research objectives. The revised model

incorporates only relevant variables essential for explaining the relationship between financial technology (FinTech) and customer retention in Nigeria. Accordingly, the functional form of the model is expressed as:

$CR = (FinTech)$.....1

And disaggregated into:

$CR = (ATM, B, POS, MB, \text{GDP, INF, INT})$

$lnCR = \beta 0 + \beta_1 \ln ATM + \beta_2 \ln IB + \beta_3 \ln POS + \beta_4 \ln MB + \beta_5 \text{ GDP} + \beta_6 \text{ INF} + \beta_7 \text{ INT} + \varepsilon$

Where,

CR is Customer retention proxy by deposits of the deposit money banks, ATM is ATM transaction to total assets ratio, IB is Internet banking transaction to total assets ratio, POS is POS transaction to total assets ratio, MB - mobile banking transactions to total assets ratio, GDP- Real gross domestic products, INF- Inflation rate, INT- Interest rate, - idiosyncratic error.

Methods of Data Analysis

The study employed the Autoregressive Distributed Lag (ARDL) model as the main analytical technique. The ARDL model is suitable for estimating both short-run and long-run relationships among variables that are integrated of different orders, i.e., I(0) and I(1), but not I(2). This choice of model is appropriate because the variables used in this study such as Automated Teller Machine (ATM) transactions, Point of Sale (POS) transactions, Internet Banking (IB), Mobile Banking (MB), Real Gross Domestic Product (GDP), Inflation Rate (INF), Interest Rate (INTR), and Customer Retention (CR) are economic time series that may exhibit different levels of stationarity.

Prior to estimation, the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) unit root tests will be conducted to determine the stationarity level of each variable. If the results show that the variables are integrated of mixed order I(0) and I(1), the ARDL bounds testing approach to cointegration developed by Pesaran, Shin, and Smith (2001) will be applied to test for the existence of a long-run relationship between financial technology and customer retention. The ARDL model is stated as:

$\Delta \ln CR_t = \partial_0 + C\sum_{k=1}^{p} \partial_1 \Delta \ln CR_{t-k} + C\sum_{k=1}^{p} \partial_2 \Delta \ln ATM_{t-k} + \sum_{k=13} \Delta \ln IB_{t-k} + \sum_{k=1}^{p} \partial_4 \Delta \ln POSt{-}k + \sum_{k=1}^{p} \partial_5 \Delta \ln MB_{t-k} + \sum_{k=1}^{p} \partial_6 \Delta \text{GDP}_{t-k} + \sum_{k=1}^{p} \partial_7 \Delta \text{INF}_{t-k} + + \sum_{k=1}^{p} \partial_8 \Delta \text{INT}_{t-k} + \alpha_1 \ln CR_{t-1} + \alpha_2 \ln ATM_{t-1} + \alpha_3 \ln IB_{t-1} + \alpha_4 \ln POS_{t-1} + \alpha_5 \ln MB_{t-1} + \alpha_6 \text{GDP}_{t-1} + \alpha_7 \text{INF}_{t-1} + \alpha_8 \text{INT}_{t-1} + \mu$

To ensure the reliability and validity of the model estimates, diagnostic tests such as the Serial correlation LM test, Heteroskedasticity test, Normality test and Ramsey reset test will be performed.

Data Presentation, Analysis and Interpretation of Results

Empirical results and Discussion

Table 1: Descriptive Statistics

	LOG_CR	LOG_ATM	LOG_INB	LOG_MB	LOG_POS	GDP	INF	INTR
Mean	9.962549	13.13990	11.99078	11.84888	11.68889	2.752627	14.82458	13.32083
Median	9.882717	13.14981	9.639373	11.43450	11.64905	2.570000	12.75000	12.58500
Maximum	10.77854	15.05259	19.06537	17.59699	17.14208	10.46372	33.85000	27.42000
Minimum	9.290998	9.945748	7.024053	5.669881	6.432602	-6.612400	7.830000	6.000000
Std. Dev.	0.416438	1.232458	4.398860	3.425367	2.933881	3.009974	6.371136	4.290103
Observations	60	60	60	60	60	60	60	60

Source: Author's Computation, 2026

Table 1 presents the descriptive statistics of the variables employed in this study. The mean value of LOG_CR is 9.9625, with a standard deviation of 0.4164, reflecting a low level of dispersion around the mean. This indicates that customer retention remained relatively stable throughout the study period. LOG_ATM, the mean of 13.1399 and standard deviation of 1.2325 show moderate variation in ATM transaction usage among customers. The mean value of LOG_INB is 11.9908, with a relatively high standard deviation of 4.3989, implying significant fluctuations in internet banking adoption over time.

Similarly, LOG_MB has a mean of 11.8489 and a standard deviation of 3.4254, suggesting noticeable changes in mobile banking activities. This implies a steady but gradually increasing level of mobile banking usage during the years covered. In the same vein, LOG_POS records a mean of 11.6889 and a standard deviation of 2.9339, indicating moderate variability in POS transactions and a relatively balanced growth trend over time.The GDP variable shows a mean of 2.7526 and a standard deviation of 3.0099, reflecting moderate fluctuations in Nigeria's economic performance, possibly influenced by macroeconomic disturbances such as recessions and oil price volatility.

Moreover, inflation (INF) has a mean of 14.8246 and a standard deviation of 6.3711, revealing high volatility in price levels during the study period. The interest rate (INTR) records a mean of 13.3208 with a standard deviation of 4.2901, indicating moderate variability, which may be attributed to irregular monetary policy adjustments across the years.

Table 2: Summary of ADF unit root test

Variables	ADF Test	5% Critical Value	P-value	Stationary	Order of integration
LOG_CR	-3.360279	-2.912631	0.0166	1st difference	I (1)
LOG_ATM	-9.115131	-3.487845	0.0123	1st difference	I (1)
LOG_INB	-8.199263	-3.489228	0.0000	1st difference	I (1)
LOG_MB	-10.92556	-2.912631	0.0000	1st difference	I (1)
LOG_POS	-9.467055	-2.912631	0.0000	1st difference	I (1)
GDP	-4.472292	-2.911730	0.0006	Level	I (0)
Inf	-4.792689	-3.489228	0.0014	1st difference	I (1)
Intr	-4.137047	-2.912631	0.0018	1st difference	I (1)

Source: Author's Computation (2026)

The results from Table 2 reveal that all variables are stationary either at level I(0) or after first differencing I(1). Specifically, GDP is stationary at level, indicating that it is integrated of order zero, while all other variables — LOG_CR, LOG_ATM, LOG_INB, LOG_MB, LOG_POS, INF, and INTR become stationary after first differencing, meaning they are integrated of order one.

The significance of the ADF test statistics and the corresponding p-values (less than 0.05) confirm that the null hypothesis of a unit root is rejected for each variable at their respective levels of stationarity. This mixture of I(0) and I(1) variables implies that the data series are not uniformly stationary, which makes the Autoregressive Distributed Lag (ARDL) model suitable for further analysis. The ARDL approach is appropriate because it accommodates variables that are integrated of different orders, provided none is integrated of order two, I(2)

Table 3: Correlation Matrix

	LOG_ATM	LOG_INB	LOG_MB	LOG_POS	GDP	INF	INTR	
LOG_CR	1.000000	0.950731	0.935315	0.988702	0.989204	-0.243887	0.754960	0.777220
LOG_ATM	0.950731	1.000000	0.890587	0.963610	0.953294	-0.328951	0.592725	0.704717
LOG_INB	0.935315	0.890587	1.000000	0.920173	0.902919	-0.241938	0.714564	0.595817
LOG_MB	0.988702	0.963610	0.920173	1.000000	0.995114	-0.281915	0.686522	0.731094
LOG_POS	0.989204	0.953294	0.902919	0.995114	1.000000	-0.267823	0.721241	0.766124
GDP	-0.243887	-0.328951	-0.241938	-0.281915	-0.267823	1.000000	-0.175916	-0.198191
INF	0.754960	0.592725	0.714564	0.686522	0.721241	-0.175916	1.000000	0.777031
INTR	0.777220	0.704717	0.595817	0.731094	0.766124	-0.198191	0.777031	1.000000

Source: Author's Computation (2026)

Table 3, presents the correlation results which indicate that customer retention (LOG_CR) has a strong and positive association with all financial technology variables — LOG_ATM (0.951), LOG_INB (0.935), LOG_MB (0.989), and LOG_POS (0.989). This suggests that an increase in ATM, internet, mobile, and POS transactions tends to enhance customer retention levels in the Nigerian banking sector. These high

correlation coefficients imply that fintech adoption is a key driver of customer engagement and loyalty. On the other hand, GDP shows a weak negative relationship with all variables, including customer retention (–0.244), suggesting that short-term changes in economic output may not directly influence customer retention or fintech usage during the study period.

The inflation rate (INF) and interest rate (INTR) are both positively correlated with customer retention, with coefficients of 0.755 and 0.777, respectively. This indicates that moderate increases in inflation and interest rates are associated with higher customer retention, possibly reflecting customer reliance on digital financial services during periods of economic adjustment.

Table 4: ARDL Bounds Test

Test Statistic	Value	K
F-statistic	3.531279	7
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.03	3.13
5%	2.32	3.5
2.5%	2.6	3.84
1%	2.96	4.26

Source: Author's Computation (2026)

Table 4 presents ARDL bounds test results F-statistic value of 3.531, which lies above the lower bound (I0 = 2.32) but slightly below the upper bound (I1 = 3.50) at the 5% significance level. This implies that the evidence of cointegration is inconclusive at the 5% level.However, when compared at the 10% significance level, the F-statistic exceeds the upper bound (I1 = 3.13), indicating the presence of a long-run equilibrium relationship between customer retention and the explanatory variables.In other words, changes in financial technology indicators (ATM, Internet Banking, Mobile Banking, and POS) alongside macroeconomic variables (GDP, Inflation, and Interest Rate) have a long-term association with customer retention in Nigeria. This justifies proceeding with both the long-run and short-run ARDL estimations to further explore the nature and strength of these relationships.

Table 5: Long run coefficient estimations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG_ATM	0.784003	4.201107	0.186618	0.8533
LOG_POS	0.075383	0.401623	0.187696	0.8525
LOG_INB	-0.057699	0.506858	-0.113837	0.9102
LOG_MB	-0.172663	1.088378	-0.158642	0.8751
GDP	0.029798	0.148714	0.200369	0.8426
INF	0.135903	0.750782	0.181016	0.8577
INTR	-0.088451	0.545942	-0.162016	0.8725
C	1.045355	39.954210	0.026164	0.9793

Source: Author's Computation (2026)

Table 5, presents long-run ARDL results show that all the financial technology variables (ATM, POS, Internet Banking, and Mobile Banking) have insignificant relationships with customer retention in the long run. ATM (LOG_ATM) has a positive but statistically insignificant coefficient (0.7840; p = 0.8533), implying that increased use of ATMs is associated with improved customer retention, but the effect is not statistically strong in the long term.

POS (LOG_POS) also has a positive and insignificant effect (0.0754; p = 0.8525), suggesting that Point of Sale transactions contribute positively but not significantly to customer retention. Internet Banking (LOG_INB) and Mobile Banking (LOG_MB) both exhibit negative but insignificant effects, indicating that although these channels may enhance digital access, their long-term contribution to customer retention has not been statistically verified within the period studied. GDP and Inflation (INF) both have positive but insignificant long-run effects, implying that macroeconomic stability could enhance retention, though the results are not statistically conclusive. Interest Rate (INTR) exhibits a negative and insignificant relationship, implying that high lending or deposit rates could reduce customer satisfaction and loyalty in the long term, but again the effect lacks statistical strength.

Table 6: ARDL short run Estimation

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOG_CR(-1))	0.249465	0.136506	1.827505	0.0783
D(LOG_CR(-3))	0.358932	0.119769	2.996873	0.0057
D(LOG_ATM(-1))	-0.016095	0.007267	-2.214871	0.0351
D(LOG_ATM(-2))	-0.017901	0.007248	-2.469932	0.0199
D(LOG_ATM(-3))	0.022964	0.006888	3.334051	0.0024
D(LOG_POS(-3))	-0.011186	0.005869	-1.905947	0.0670
D(LOG_INB(-2))	0.005374	0.001947	2.760757	0.0101
D(LOG_INB(-3))	-0.002467	0.001447	-1.705220	0.0992
D(LOG_MB)	0.012321	0.006347	1.941178	0.0624

D(LOG_MB(-2))	0.013273	0.007104	1.868284	0.0722
D(LOG_MB(-3))	0.011528	0.005732	2.010957	0.0540
D(INF)	0.001924	0.000485	3.964458	0.0005
D(INTR(-3))	-0.001252	0.001041	-1.203076	0.0292
CointEq(-1)	-0.102623	0.055257	-1.857206	0.0761

Source: Author's Computation (2026)

The short-run estimates in Table 6 reveal the immediate and dynamic impact of financial technology indicators and macroeconomic factors on customer retention in Nigeria. Lagged values of customer retention (D(LOG_CR(-1)) and D(LOG_CR(-3))) are positive and statistically significant at the 10% and 1% levels respectively. This implies that past customer retention rates strongly influence current retention, confirming the presence of persistence in customer behavior.

ATM transactions (D(LOG_ATM)) show mixed short-run effects. The first and second lags are negative and significant, suggesting that short-term increases in ATM usage initially reduce retention, possibly due to service charges or network failures. However, the third lag turns positive and significant (p = 0.0024), indicating that over time, improved ATM reliability enhances customer confidence and retention. POS transactions (D(LOG_POS(-3))) show a negative but weakly significant relationship (p = 0.0670), implying that POS usage may initially discourage retention due to transaction delays or service issues.

Moreso, Internet Banking (D(LOG_INB(-2))) has a positive and significant effect (p = 0.0101), implying that as customers increasingly adopt online banking services, their likelihood of maintaining long-term relationships with banks improves.Mobile Banking (D(LOG_MB)) and its lags are positive and weakly significant (p-values between 0.05 and 0.07), demonstrating that mobile financial services contribute positively to customer retention in the short term. Inflation (D(INF)) is positive and highly significant (p = 0.0005), showing that moderate inflation may increase transaction volumes through digital channels as customers seek convenience and cost efficiency.

Interest rate (D(INTR(-3))) exhibits a negative and significant coefficient (p = 0.0292), indicating that rising interest rates may discourage customer engagement and retention by reducing affordability of financial products. However GDP is not significant in the short run but I'm the long run this suggests that GDP has long run relationship with customer retention and fintech.

The Error Correction Term (CointEq(-1)) carries the expected negative sign (-0.1026) and is statistically significant at the 10% level, confirming the existence of a long-run equilibrium relationship among the variables. The coefficient implies that approximately 10.26% of short-run disequilibrium is corrected each period, meaning that any short-run deviation in customer retention adjusts slowly towards the long-run equilibrium.

4.3 Diagnostic Test Results

Table7: Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.367604	Prob. F(27,28)	0.2076
Obs*R-squared	31.84917	Prob. Chi-Square(27)	0.2377
Scaled explained SS	10.31137	Prob. Chi-Square(27)	0.9984

Source: Author's Computation (2026)

The results of the Breusch-Pagan-Godfrey heteroskedasticity test are displayed in Table 7. The p-values for the F-statistic (0.2076), Obs*R-squared (0.2377), and Scaled explained SS (0.9984) are all greater than the 5% significance level. This implies that the null hypothesis of homoskedasticity (constant variance of residuals) cannot be rejected.

Hence, the model is free from heteroskedasticity, confirming that the residuals are evenly distributed across the fitted values. This indicates that the estimated ARDL model is statistically reliable and that the standard errors of the coefficients are consistent and efficient.

Table 8: Ramsey RESET Test

	Value	Df	Probability
t-statistic	0.545011	27	0.5902
F-statistic	0.297037	(1, 27)	0.5902

F-test summary:

	Sum of Sq.	Df	Mean Squares
Test SSR	9.86E-06	1	9.86E-06
Restricted SSR	0.000906	28	3.24E-05
Unrestricted SSR	0.000896	27	3.32E-05

Source: Author's Computation (2026)

Table 8, present the result of Ramsey Reset test. It is indicates that the model used in the study is well specified and does not suffer from specification errors such as omitted variables or incorrect functional form. In other words, the functional relationship between customer retention and the explanatory variables (ATM, POS, Internet Banking, Mobile Banking, GDP, inflation, and interest rate) has been appropriately captured by the ARDL model. Hence, the model is reliable and suitable for drawing valid inferences about the impact of FinTech on customer retention in Nigerian banks.

Table 9: Breusch-Godfrey Serial Correlation LM Test:

F-statistic	8.492835	Prob. F(4,24)	0.0002
Obs*R-squared	32.81613	Prob. Chi-Square(2)	0.0000

Source: Author's Computation (2026)

As presented in table 9, the Breusch-Godfrey (BG) Serial Correlation LM test was conducted to examine whether the residuals of the ARDL regression model are serially correlated — that is, whether the error terms in one period are correlated with those in previous periods. The null hypothesis (H_0) of the test states that there is no serial correlation in the residuals, while the alternative hypothesis (H_1) indicates the presence of serial correlation. Since both probability values (0.0002 and 0.0000) are less than the 5% significance level (0.05), the null hypothesis of no serial correlation is rejected. This implies that the residuals from the estimated model exhibit serial correlation, meaning the errors are not independent across time. In other words, past error terms significantly influence current errors, which suggests that the model may have some degree of autocorrelation.

4.4 Discussion of Findings

The findings of this study provide insights into the impact of financial technology (FinTech) on customer retention within the Nigerian banking industry, using Automated Teller Machines (ATMs), Internet Banking, Mobile Banking, and Point of Sale (POS) transactions as major proxies.

The ARDL long-run results revealed that all FinTech variables ATM, POS, Internet Banking, and Mobile Banking have insignificant long-run relationships with customer retention. This implies that although the adoption of digital channels has expanded access to banking services, their effect on sustaining long-term customer loyalty remains weak. This result is in line with the findings of Akintunde and Akaighe (2016), who observed that customer retention in Nigerian banks depends more on the quality of relationship management strategies than on the technological platforms themselves. Similarly, Okoro, Nnam, Etukudo, and Obizuo (2024) reported that while FinTech adoption enhances service convenience, its influence on long-term customer retention is limited without complementary customer engagement mechanisms.

However, in the short run, the results revealed that some FinTech indicators particularly ATMs, Internet Banking, and Mobile Banking exert significant effects on customer retention. Specifically, the negative short-run coefficients of ATM usage suggest that higher ATM transactions may temporarily reduce retention due to challenges such as network failures, dispensing errors, or service charges. This aligns with Torutein (2025) and Bankole et al. (2020), who noted that customer dissatisfaction often arises from poor FinTech service delivery and inconsistent user experiences, which can erode trust in the short term.

Conversely, Internet and Mobile Banking were found to have positive short-run effects, implying that digital platforms have the potential to improve convenience and engagement when service reliability is ensured. This finding supports the works of Adewumi and Ige (2023) and Amadi, Anucha, and Uwabor (2020), who established that effective mobile and online banking systems significantly enhance customer satisfaction

and retention by providing flexible access and real-time transaction capabilities.

Moreover, the insignificance of the long-run coefficients in this study may also reflect structural and infrastructural limitations within Nigeria's financial ecosystem, as discussed by Olopade, Akintan, and Jolaosho (2025) and Banabo and Perearau (2025). These authors emphasize that while FinTech penetration is increasing, challenges such as unstable power supply, cybersecurity risks, and low financial literacy continue to weaken its long-termeffectiveness on customer loyalty.

Additionally, the control variables GDP, inflation, and interest rate were found to be statistically insignificant in the long run, suggesting that macroeconomic instability and monetary policy fluctuations may not directly determine customer retention levels. This corroborates Torutein (2025), who argued that economic growth alone does not guarantee customer loyalty unless accompanied by sustained improvements in financial service quality and accessibility.

Overall, these findings indicate that financial technology innovations in Nigeria contribute more to short-term customer satisfaction than to long-term loyalty. This reinforces the argument by Bankole et al. (2020) that customer retention requires not only technological innovation but also strategic trust-building and service reliability measures. Therefore, the study concludes that FinTech adoption, while vital for modern banking operations, must be complemented by customer-centric policies to achieve sustainable retention outcomes in Nigeria's banking sector.

Conclusion

The study concludes that financial technology innovations have enhanced short-term customer satisfaction but have not yet translated into long-term customer retention in the Nigerian banking industry. The short-run significance of Internet and Mobile Banking suggests that customers value convenience and accessibility provided by digital platforms. However, the long-run insignificance of all FinTech variables implies that technological innovations alone are insufficient to guarantee loyalty without reliability, trust, and strong customer relationship management.

Furthermore, macroeconomic variables such as GDP, inflation, and interest rates were statistically insignificant, indicating that customer retention is more influenced by service quality and digital experience than by broader economic conditions.

Therefore, improving customer retention in Nigeria's FinTech-driven banking environment requires a combination of technological innovation, customer trust-building, and consistent service delivery strategies.The study recommends banks to strengthen the reliability of FinTech platforms such as ATMs, POS, and mobile banking applications frequent system downtime, transaction errors, and cybersecurity threats which can reduce customer trust and satisfaction. Bank continuous education and digital literacy programs can improve usage confidence and satisfaction, thereby increasing customer retention, they should also combine FinTech innovation with personalized service delivery and effective customer relationship management.

Regulators such as the Central Bank of Nigeria (CBN) should strengthen policies that encourage innovation while protecting consumers' data and privacy. Consistent epolicy frameworks will enhance trust in digital financial systems.

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