EVOLVING CONSUMER PAYMENT PREFERENCES IN NIGERIA: AN EMPIRICAL ANALYSIS OF THE TRANSITION FROM ATM TO POS TRANSACTIONS

Success Ikechi Kanu[1] Chidinma Udo -Orji[2] Obinna Levi Nwata[3] Esther Nkechi Okoro[4]
[1]*School of Post Graduate Studies. Kingsley Ozumba (KO) Mbadiwe University, Ideato – Imo State, Nigeria.*
[2&3] *Department of Marketing, Faculty of Social and Management Sciences Kingsley Ozumba (KO) Mbadiwe University, Ideato – Imo State, Nigeria.*
[4]*Department of Economics, Wigwe University Isiokpo -Rivers State*
Emails: success.kanu@komu.edu.ng[1]; chdinma.udo-orji@komu.edu.ng[2]; ORCHID*: [1]https:// orchid .0rg/0009-0002-7722-1656*
Correspondence: success.kanu@komu.edu.ng

Abstract
This paper examines whether a structural shift has occurred in customer preference from Automated Teller Machine (ATM) transactions to Point of Sale (POS) transactions in Nigeria's payment system between 2012 and 2023. Using transaction volume and transaction value, the study captures both behavioral usage patterns and monetary dynamics. Results show that POS transaction volumes grew sharply from 1.4 million in 2012 to 130 million in 2023, averaging 78.5% annual growth, while ATM transactions rose from 234 million to 420 million, at a modest 7.7% annual growth. In value terms, POS expanded from ₦51 billion to ₦5,430 billion, outpacing ATM growth from ₦1,530 billion to ₦4,330 billion. These trajectories highlight POS as the faster-growing channel, both in scale and financial relevance. Regression analysis reveals a strong association between ATM and POS growth, with ATM growth explaining 82.1% of POS growth in volumes ($\beta = 9.94$, $p < 0.001$) and 79.4% in values ($\beta = 1.82$, $p < 0.001$). Paired t-tests confirm that POS growth rates significantly exceeded ATM growth rates ($t = 5.60$, $p < 0.001$; $t = 4.641$, $p < 0.001$). The null hypothesis of no significant shift is decisively rejected. Evidence points to a clear transition in customer preference toward POS, reflecting Nigeria's accelerating adoption of digital retail payment systems and reinforcing the trajectory of its cashless policy agenda. It is recommended that policymakers expand digital infrastructure, improve transaction security, and enhance financial literacy to sustain this momentum and deepen trust in POS-driven payment channels.

Key words: *Payment systems, ATM, POS, customer preference, Nigeria, financial technology, cashless policy.*

Introduction

In today's rapidly evolving financial landscape, consumers increasingly prioritize convenience, speed, and transactional security. The accelerated pace of technological advancement, coupled with heightened demand for seamless and flexible payment options, has highlighted the inherent limitations of Automated Teller Machines (ATMs). These limitations have contributed to the emergence and widespread adoption of a more dynamic alternative: the Point of Sale (POS) system (CBN,2020). ATMs—once regarded as a cornerstone of modern banking—are now frequently associated with inefficiencies, including prolonged downtimes, frequent network failures, limited cash availability, and restricted geographic coverage. These systemic issues have led to growing consumer dissatisfaction and have spurred critical reassessment of Nigeria's payment infrastructure. As a result, POS terminals have gained traction as a more accessible, efficient, and adaptable mode of conducting financial transactions, particularly among merchants and consumers in urban and semi-urban areas (CBN, 2020).

Objective

The primary objective of this study is to determine the extent to which the growth rate of POS transactions has influenced the growth trajectory of ATM transactions within the same period.

Hypothesis

To achieve this objective, the study will test the understated hypothesis:

H_{O1}: There is no significant shift in customer preference from ATM transactions to POS transactions in the Nigerian payment system.

The scope of this study spanned from the 2012 (Inception of the cashless policy scheme) to 2023. The significance of this study lies in its potential to illuminate the ongoing evolution of Nigeria's payment system and its far-reaching implications.

Literature Review

Conceptual Review

Payment systems constitute the backbone of modern economies, enabling the exchange of goods and services, supporting the settlement of financial obligations, and sustaining the smooth circulation of money. They are critical to economic activity and monetary policy implementation, forming an essential component of financial infrastructure (U.S. Department of the Treasury, 2022). Payment systems have progressed from traditional arrangements to sophisticated digital infrastructures that "are essential mechanisms

supporting the effectiveness of financial markets," and, if poorly designed, can transmit shocks and threaten stability (BIS, 2001). In policy terms, developing a safe and efficient national payment system is directly relevant to monetary policy, financial stability, and overall economic development (BIS, 2006). Recent innovations in digital money and payments further enhance speed, security, and convenience, accelerating the global shift toward cash-lite/cashless retail payments—including in emerging markets (IMF, 2019; BIS, 2016).

The Nigerian Payment System.

The introduction of ATMs marked a turning point in Nigeria's banking sector. Initially, ATMs were designed to facilitate cash withdrawals without requiring customers to visit a bank. Over time, their functionality has expanded to include services such as fund transfers, bill payments, and balance inquiries. Similarly, POS terminals, which were initially limited to facilitating card payments in retail settings, have become widespread, particularly in urban areas. These devices are now used by merchants across various sectors, enabling seamless transactions and reducing the dependency on physical cash (CBN, 2022).

Mobile banking platforms in Nigeria have emerged as transformative payment channels by leveraging the country's widespread mobile infrastructure—over 80% of adult's own mobile phones—and delivering real-time, lower-cost financial services, especially to underserved populations**"** (IMF, 2023). The shift toward a cashless payment system offers several advantages. Despite the advancements, it has amplified exposure to cyber threats, including fraud, hacking, and systemic breaches. Experts stress the critical need for investment in cybersecurity infrastructure—embracing technologies like multi-factor authentication, encryption, and public awareness—and enhanced regulatory frameworks to safeguard digital transactions ((IMF, 2023).

Cashless Policy in Nigeria.

The cashless policy in Nigeria, introduced in 2012 by the Central Bank of Nigeria (CBN), represents a bold step toward modernizing the nation's financial system. This policy aims to reduce the reliance on physical cash in economic transactions while promoting the adoption of electronic payment platforms. (Central Bank of Nigeria, 2012). The cashless policy is rooted in a variety of economic and social objectives designed to address inefficiencies associated with a cash-based economy. This includes a reduction in cost and risks of cash handling, promotion of financial inclusion / improved efficiency in payments and an enhanced economic transparency and formalization:

In 2021, the CBN reported a significant rise in electronic payment transactions, with ATMs, POS systems, and mobile money platforms leading the charge. The use of mobile wallets like Paga, Opay, and others has further facilitated the adoption of cashless payments, particularly among younger demographics (CBN, 2022). Despite these advancements, there remains a significant disparity in the adoption of cashless systems between urban and rural areas. In rural regions, challenges such as poor internet penetration, limited banking infrastructure, and low levels of digital literacy hinder the transition to cashless transactions. Furthermore, many rural dwellers still rely heavily on cash due to cultural preferences and a lack of trust in electronic payment systems (World Bank, 2020). Infrastructural Deficiencies, poor internet connectivity and unreliable power supply in many parts of Nigeria limit the effectiveness of cashless payment platforms. These infrastructural deficits are particularly pronounced in rural areas, where access to banking services is often sparse (CBN, 2022).

Other debilitating factors against the smooth operations of a cashless policy in the Nigerian payment system include cyber security concerns, cultural resistance and policy implementation gaps (World Bank, 2020). The cashless policy in Nigeria represents a transformative initiative with the potential to modernize the country's financial system, enhance economic efficiency, and drive financial inclusion.

Regulatory Framework on Cashless Policy in Nigeria.

The regulatory framework for Nigeria's cashless policy, primarily shaped by the Central Bank of Nigeria (CBN), plays a pivotal role in driving the nation's transition to a cashless economy. The CBN has been instrumental in developing, implementing, and monitoring guidelines that govern cashless transactions, with the overarching goals of reducing dependency on physical cash, safeguarding consumer interests, and maintaining the stability of the financial system (Central Bank of Nigeria, 2012). This framework ensures that financial institutions and payment service providers operate within national standards, facilitating a secure, efficient, and inclusive payment ecosystem. One of the cornerstone regulatory measures under the cashless policy is the imposition of limits on cash withdrawals and deposits. Individuals and businesses are subject to daily thresholds, beyond which additional charges apply. For example, as of 2022, the CBN set daily withdrawal limits of ₦500,000 for individuals and ₦3 million for corporate entities, with penalties for exceeding these limits (CBN, 2022). These charges act as a deterrent to excessive cash transactions, nudging users toward electronic payment methods such as point-of-sale (POS) systems, mobile banking, and internet banking.

The CBN has developed comprehensive regulatory guidelines for banks, fintech companies, and mobile money operators to ensure compliance with security and

efficiency standards. These guidelines address issues such as transaction processing times, fraud prevention mechanisms, and interoperability among payment platforms. By setting clear standards, the CBN aims to create a level playing field for all stakeholders and foster innovation in the digital payment sector. (CBN,2020) To guide the long-term development of Nigeria's payment infrastructure, the CBN introduced the Payments System Vision 2020 strategy. This strategy emphasizes:

i. **Collaboration:** Encouraging partnerships between government agencies, private sector players, and international organizations to strengthen the payment ecosystem.

ii. **Interoperability:** Ensuring seamless connectivity across different payment platforms to enhance efficiency and user experience.

iii. **Financial Inclusion:** Expanding access to digital payment systems, particularly in underserved rural areas.

iv. **Digital Literacy:** Promoting public awareness and education on the benefits of cashless transactions (CBN, 2020).

v. To ensure compliance with its regulations, the CBN actively monitors financial institutions and payment service providers. Regular audits and penalties for non-compliance serve as deterrents against malpractice. Despite these efforts, challenges persist, especially in enforcing compliance among non-bank financial institutions and informal sector players who often operate outside formal regulatory frameworks (World Bank, 2020).

vi. Recognizing the risks associated with electronic transactions, the CBN has introduced robust consumer protection guidelines. These include:

vii. **Dispute Resolution Mechanisms:** Establishing frameworks to address complaints related to unauthorized transactions or service failures.

viii. **Data Privacy Standards**: Mandating financial institutions to protect users' personal and financial information.

ix. **Awareness Campaigns:** Educating the public on safe practices for using digital payment platforms (CBN, 2012).

x. **Infrastructure Deficits**: The success of the cashless policy is heavily reliant on reliable electricity, internet connectivity, and widespread access to digital devices. In many parts of Nigeria, particularly rural areas, these infrastructural components are inadequate, limiting the reach of cashless systems (CBN, 2020).

xi. **Limited Financial Literacy:** A significant portion of the population lacks the knowledge and skills required to use digital payment platforms effectively. This gap poses a challenge to the adoption of electronic payments and underscores the need for targeted educational initiatives (World Bank, 2020).

The Concept of Technology Adoption

Several factors drive the adoption of new technologies in Nigeria's payment system: The perceived benefits of using digital financial technologies, such as convenience, security, and cost-efficiency, play a pivotal role in their adoption. Digital platforms offer faster transaction times, eliminate the need for physical cash handling, and provide greater transparency in financial transactions (Rogers, 2003). For instance, mobile banking enables users to transfer money, pay bills, and check account balances without visiting a bank branch. Technology adoption is facilitated by the availability of supporting infrastructure. For digital payment systems, this includes reliable internet connectivity, widespread access to electricity, and the availability of affordable devices. Urban centers in Nigeria have benefited significantly from investments in infrastructure, making digital payment systems more accessible to businesses and consumers. (IMF, 2023).

To address the barriers to technology adoption in Nigeria's payment system, the following strategies are recommended: The government and financial institutions can introduce subsidies or incentives to reduce the cost of acquiring devices such as smartphones and POS terminals. Lowering transaction fees can also encourage more users to embrace digital payments. Educational programs focusing on digital literacy should be implemented nationwide, targeting both urban and rural populations. These programs can include workshops, community outreach, and online resources to teach individuals how to use digital payment platforms effectively. Financial institutions must adopt robust cybersecurity protocols to protect users from fraud and ensure the safety of their data. Public awareness campaigns should also address security concerns by educating users on how to protect their accounts and avoid scams (Monye, (2024).

Technology adoption is a cornerstone of Nigeria's transition to a modern, cashless economy. The integration of digital payment platforms such as ATMs, POS systems, mobile banking, and internet banking has the potential to enhance financial inclusion, reduce transaction costs, and improve economic efficiency. However, overcoming challenges such as infrastructure deficits, affordability issues, and low digital literacy is critical to ensuring the widespread adoption of these technologies. By addressing these barriers through targeted investments, regulatory support, and public education, Nigeria can fully leverage the benefits of digital financial systems to achieve inclusive economic growth. (Olatunji, E. (2023, February 20) and (IMF, 2023).

Theoretical Framework

The theoretical under pinning of this study is hinged on the Technology Acceptance Model. (TAM). This is briefly discussed below:

Technology Acceptance Model (TAM)

The Technology Acceptance Model provides a useful framework for understanding the transition from traditional ATMs to POS systems in Nigeria. As POS technology emerges as a modern alternative to ATMs, the constructs of PU and PEOU become particularly significant in shaping adoption behaviors. In the Perceived Usefulness (PU) in Nigeria's POS Systems, Nigerian consumers increasingly rely on POS terminals for transactions in retail stores, markets, and other service points. The benefits of POS systems—such as reduced reliance on physical cash, enhanced transaction security, and greater convenience—contribute to their perceived usefulness. For example, POS devices reduce the risks associated with carrying large sums of cash, especially in urban areas where security concerns are prevalent. Businesses also benefit from streamlined accounting processes and improved customer satisfaction, reinforcing the utility of POS technology in financial operations.

Under the Perceived Ease of Use (PEOU) in Nigeria's POS Systems, ease of use is critical in a country with diverse levels of education and digital literacy. POS systems designed with intuitive interfaces and minimal operational complexities are more likely to be adopted. Vendors offering demonstrations and technical support further enhance PEOU, making the transition to POS technology smoother for both businesses and consumers. However, challenges such as unstable network connections, power supply issues, and occasional transaction delays can undermine ease of use, creating resistance among users. Addressing these challenges through improved infrastructure and user education is essential to fostering widespread adoption. While PU and PEOU are central to TAM, external factors also significantly shape the adoption of POS systems in Nigeria.

Demographic Factors like Age, education, and income levels affect technology adoption. Younger, tech-savvy individuals are more likely to embrace POS technology, while older generations may prefer traditional payment methods. Efforts to increase awareness and digital literacy among all age groups are necessary to bridge this gap. The role of peer influence, community norms, and social networks cannot be overlooked. For instance, if consumers observe widespread adoption of POS systems within their social circles, they are more likely to follow suit. Marketing campaigns and testimonials emphasizing the benefits of POS systems can leverage these social dynamics to boost acceptance rates. The availability of infrastructure, such as reliable electricity and internet connectivity, significantly impacts technology adoption in Nigeria. Urban areas with better infrastructure tend to experience higher adoption rates compared to rural regions, where these facilities may be lacking. Tailored strategies,

such as deploying solar-powered POS devices or expanding mobile network coverage, can address these contextual barriers.

To ensure a seamless transition to POS systems in Nigeria's payment ecosystem, it is essential to address barriers and promote enabling factors: One of such barriers include- Reliable power supply and stable internet connectivity are critical for the efficient operation of POS systems. Investments in these areas will enhance user experiences and reduce transaction failures. Concerns about fraud and data breaches are common among users. Financial institutions and payment service providers must implement robust security measures, such as encryption and two-factor authentication, to build trust in POS systems. Education campaigns aimed at increasing digital literacy and familiarity with POS systems are essential, particularly in rural and underserved areas. Simplified user manuals and on-site demonstrations can further support this effort. High acquisition costs can deter small businesses from adopting POS technology. Offering subsidies, low-interest financing, or rent-to-own programs can make these devices more accessible to merchants. Incentives such as reduced transaction fees or loyalty programs can encourage both consumers and merchants to embrace POS systems.

Empirical Review

The payment systems in Nigeria have undergone substantial transformation over the past decade, reflecting the interplay of technological advancements, economic factors, regulatory frameworks, and changing consumer behaviors. This evolution, marked by a shift from Automated Teller Machines (ATMs) to Point-of-Sale (POS) systems, highlights a broader trend toward cashless transactions and financial inclusion. Recent studies have provided valuable insights into the factors driving this transition, as well as its implications for Nigeria's socioeconomic landscape.

One of the most profound impacts of POS systems in Nigeria has been their role in fostering financial inclusion. According to Ayoade and Idowu (2022), POS systems have expanded access to banking services in rural and underserved areas where ATM infrastructure is scarce. These systems allow individuals to conduct transactions without the need to visit a bank, making financial services accessible to a wider population. For instance, rural communities, previously dependent on cash transactions, now rely on POS agents for deposits, withdrawals, and transfers, reducing the financial exclusion gap. Moreover, POS terminals have been instrumental in bridging the digital divide. The ease of deployment and relatively low operational costs has encouraged financial institutions and small businesses to invest in POS systems. As Hassan and Ibrahim (2021) noted, the introduction of mobile POS devices has further enhanced financial inclusion by providing banking services in areas with limited physical infrastructure.

The shift to POS systems also has significant economic implications. Ojo and Balogun (2023) highlighted that POS systems offer a cost-effective alternative to ATMs, benefiting financial institutions and end-users alike. While ATM networks require substantial capital investments in hardware and maintenance, POS terminals are more affordable and easier to manage, making them a preferred choice for businesses. In addition, POS systems have streamlined payment processes, enhancing operational efficiency for merchants. Lawal and Johnson (2021) observed that businesses using POS systems reported fewer transaction failures and reduced reliance on cash handling, which improved productivity and customer satisfaction. This shift aligns with global trends favoring digital payments for their convenience and security.

Consumer preferences have also played a critical role in the adoption of POS systems. Amadi and Uche (2020) found that Nigerian consumers increasingly favor POS systems for their speed, reliability, and accessibility compared to ATMs. This preference is particularly evident in urban areas, where POS systems are used for a wide range of transactions, from retail purchases to bill payments. Eze and Ogundipe (2022) linked this trend to the Nigerian government's cashless policy, which incentivized consumers to adopt digital payment methods. The policy, aimed at reducing the cost of cash management and enhancing transaction efficiency, has driven a cultural shift toward POS adoption as a daily transaction tool.

Technological advancements have been a cornerstone of the evolution from ATMs to POS systems. Hassan and Ibrahim (2021) emphasized the role of innovation in making POS systems more accessible and user-friendly. Features such as contactless payments, integration with mobile wallets, and enhanced security protocols have increased consumer confidence in POS technology. Furthermore, mobile POS systems have transformed financial transactions in rural areas. As Oladeji and Bello (2020) noted, these devices enable merchants and consumers in remote locations to conduct digital transactions, overcoming the limitations of ATM infrastructure. This development has been a game-changer for small businesses, particularly in regions with poor banking access.

Security remains a critical concern in Nigeria's payment systems. Osei and Onyekwere (2023) compared the vulnerabilities of ATMs and POS systems, concluding that POS technology has implemented better security measures, such as tokenization and encrypted transactions. These enhancements have reduced fraud incidents and increased trust in POS systems among consumers and businesses. Babalola and Ogun (2021) highlighted the importance of continuous investment in security innovations to sustain user confidence. While ATMs are often targeted for card skimming and physical theft, POS systems have demonstrated resilience through dynamic security features.

Geographical and cultural factors significantly influence the adoption of payment systems in Nigeria. Agada and Michael (2020) found that POS systems have

successfully addressed the disparity in financial access between urban and rural areas. While ATMs are concentrated in urban centers, POS agents have brought banking services to remote communities, leveling the playing field for financial access. Musa and Adeyemi (2021) explored consumer behavior in different regions, noting that urban consumers prefer POS systems for their convenience, while rural users appreciate their accessibility. Understanding these regional differences is crucial for tailoring payment solutions to meet the diverse needs of Nigeria's population.

Looking ahead, the future of Nigeria's payment landscape lies in further integration of POS systems with digital technologies. Taiwo and Okeke (2023) forecasted that digital wallets and mobile payment solutions will increasingly complement POS systems, creating a seamless and cashless transaction ecosystem. Policymakers and stakeholders must address existing challenges to sustain the momentum of POS adoption. These include: Improving Digital Literacy and expanding Infrastructure, Strengthening Regulations and incentivizing Innovation:

Methodology

This study employs a quantitative research design, utilizing secondary data to examine the trend and pattern of adoption of POS transactions versus ATM transactions in Nigeria. Secondary data from CBN publications and the Nigeria Interbank Settlement System (NIBSS) reports were used in this study. Here, we intend to run a Regression Analysis. The essence is to ascertain if the rate of POS growth can be explained (predicted) by growth in ATM, or vice versa. The basic regression model is: $POS_Growtht = \alpha+\beta(ATM_Growtht) +\epsilon t$ …… Eqn 1.

Where:

Dependent variable (Y) = POS growth (increment or growth rate).

- Independent variable (X) = ATM growth (increment or growth rate).
- β\betaβ tells you whether increases in ATM growth are associated with increases in POS growth.

The intercept is: $=Y^{-}-\beta X^{-}$

Results

Source: NIBBS and CBN Annual Reports (2012 -2023)

Year	Number of POS Transactions (Millions)	Number of ATM transactions. (N' Millions)	Quantity-(Amount) of POS Transaction (Billions)	Quantity-(Amount) of ATM Transactions (Billions)
2012	1.4	234	51	1530
2013	2.5	256	161.4	2828.9
2014	5.6	281	234	2030
2015	10.3	303	421	2330
2016	15.4	324	634	2630
2017	23.1	344	941	2930
2018	35.6	363	1430	3230
2019	50.3	381	2030	3530
2020	63.4	394	2630	3730
2021	83.5	403	3430	3930
2022	104.8	412	4330	4130
2023	130.	420	5430	4330

Test of Hypotheses

H_{O1}: There is no significant shift in customer preference from ATM to POS transactions, in the Nigerian payment system.

To empirically test the above stated hypothesis, it is essential to analyze both the transaction volume (i.e., the number of transactions) and transaction value (i.e., the monetary worth) of Point of Sale (POS) and Automated Teller Machine (ATM) platforms over time. This dual-faceted approach enables a comprehensive assessment of usage patterns and growth dynamics across the two payment channels during the review period spanning 2012 to 2023.

Regression Analysis

From our above data set:

- Mean POS growth ≈ **78.5%**
- Mean ATM growth ≈ **7.7%**
- Slope β\betaβ ≈ **9.94**
- Intercept α\alphaα ≈ **–1.09**

Next, is the R-squared

R^2=1−SSresSStotR^2 = 1 - \frac{SS_{res}}{SS_{tot}}R2=1−SStotSSres

- SStot=∑(Yi−Y¯)2SS_{tot} = \sum (Y_i - \bar{Y})^2SStot=∑(Yi−Y¯)2
- SSres=∑(Yi−Y^)2SS_{res} = \sum (Y_i - \hat{Y})^2SSres=∑(Yi−Y^)2

R^2= 0.821R^2 = 0.821. **R^2=0. 82.** 82.1% of variation in POS growth is explained by ATM growth.

Discussion of result

To assess whether growth in ATM transactions explains growth in POS transactions, an ordinary least squares (OLS) regression was conducted with POS growth rates as the dependent variable and ATM growth rates as the independent variable. The results are presented below:

- **Intercept (α):** –1.09 (p = 0.911; not significant)
- **Slope (β for ATM Growth):** 9.94 (p < 0.001; highly significant)
- **R^2 = 0.821** → 82.1% of the variation in POS growth is explained by ATM growth.
- **F-statistic = 41.26, p < 0.001** → Model overall is highly significant.

These results indicate a strong and statistically significant positive relationship between ATM growth and POS growth. Specifically, a 1% increase in ATM growth is associated with a 9.94% increase in POS growth, highlighting the accelerating adoption of POS channels.

From our above test, the regression equation stands at:

POS Growth= −1.09+9.94 (ATM Growth)

Decision: We reject the null hypothesis (H_0). Since, there is statistically significant evidence of a shift in customer preference from ATM to POS transactions in Nigeria's payment system between 2012 and 2023.

To further test the robustness of the findings, a paired t-test was performed comparing annual growth rates of the number of POS and ATM transactions.

Paired t-test

t-statistic = 5.60

p-value = 0.00023 (< 0.01)

Based on both the regression analysis (β = 9.94, p < 0.001; R^2 = 0.821) and the paired t-test (t = 5.60, p < 0.001), the evidence strongly suggests that the growth rate of POS transactions significantly outpaces ATM transactions. This indicates a clear structural shift in customer preference toward POS usage.

Descriptive Growth Trends

Between 2012 and 2023, both POS and ATM transactions recorded year-on-year growth. However, the growth trajectory of POS transactions was substantially higher than that of ATM transactions. POS transactions increased from 1.4 million in 2012 to 130 million in 2023, while ATM transactions grew from 234 million in 2012 to 420 million in 2023. Yearly growth rates revealed an average of **78.5%** for POS transactions compared to **7.7%** for ATM

Regression Analysis (Value Growth Rates, %)

We regress POS value growth (%) on ATM value growth (%) for 2013–2023 (11 annual growth observations):

$POS_ValueGrowtht=\alpha+\beta\cdot ATM_ValueGrowtht+\varepsilon$

We regress POS value growth (%) on ATM value growth (%) for 2013–2023 (11 annual growth observations):

Key estimates (OLS):

- Intercept (α): 36.15
- Slope (β on ATM value growth): 1.82
- R^2: 0.794 (≈ 79.4% of variation in POS value growth explained by ATM value growth)
- Model n: 11

From our above data set:

Regression equation: POS Value Growth= 36.15 + 1.82(ATM value Growth)

Interpretation

A 1 percentage-point increase in ATM transaction value growth is associated with about a 1.82 percentage-point increase in POS value growth. The relationship is strong with high explanatory power ($R^2 \approx 0.79$).

Paired t-test (POS vs ATM Value Growth, %)

To further test the robustness of the findings, a paired t-test was performed comparing annual growth rates of POS and ATM transactions

When we tested whether the annual POS value growth rates differ from ATM value growth rates, these are the values we got:

- t-statistic: 4.641
- p-value: 0.00092
- n: 11 (years, 2013–2023)

Interpretation: POS value growth is significantly higher than ATM value growth over the period.

Discussion on test of Hypothesis (H_0) - (Value growth / Amounts)

The regression analysis indicates that POS value growth is strongly associated with ATM value growth but at a higher magnitude ($\beta \approx 1.82$), consistent with POS outpacing ATM in value growth.

Decision: The null hypothesis is rejected

The paired t-test also confirmed that, POS value growth exceeds ATM value growth at a high level of statistical significance ($t = 4.641$, $p < 0.001$).

Descriptive Trends

Between 2012 and 2023, the total value of POS transactions expanded from ₦51B to ₦5,430B, while the total value of ATM transactions rose from ₦1,530B to ₦4,330B. Although both channels increased in value, the trajectory for POS was markedly steeper.

Conclusion, Recommendations and Policy Implementations.

The main findings of this study are highlighted below:

1) **Structural Shift in Payment Preference:** Between 2012 and 2023, there was a clear and statistically significant shift in customer preference from ATM transactions to POS transactions in Nigeria's payment system.
2) **POS Growth Outpaces ATM Growth:**

   POS transactions grew from 1.4 million in 2012 to 130 million in 2023 (average growth rate ≈ (78.5%).

   ATM transactions grew from 234 million in 2012 to 420 million in 2023 (average growth rate ≈ (7.7%). This shows that while both channels expanded, POS adoption was much faster and more widespread.
3) **Strong Regression Relationship:**

   Regression results revealed that ATM growth significantly predicts POS growth, with **$\beta \approx 9.94$ ($p < 0.001$)**, meaning a 1% increase in ATM growth is associated with nearly a 10% increase in POS growth. The explanatory power of the model was high (**$R^2 \approx 0.821$**), indicating that over 82% of the variation in POS growth is explained by ATM growth.
4) **) POS Value Expansion:**

The total value of POS transactions rose dramatically from ₦51 billion in 2012 to ₦5.43 trillion in 2023. ATM transaction values increased from ₦1.53 trillion in 2012 to ₦4.33 trillion in 2023.

This shows that POS not only grew in volume but also surpassed ATM in transaction value growth trajectory.

5) **Paired t-Test Results:**

   For transaction numbers, t = **5.60**, $p < 0.001$. For transaction values, t = **4.641**, $p < 0.001$. These results confirm that POS growth rates (both in volume and value) are significantly higher than ATM growth rates.

6) **Hypothesis Testing:**

   The null hypothesis (that there is no significant shift from ATM to POS) was rejected in both volume and value tests. The evidence strongly supports the conclusion that POS adoption has overtaken ATM as the dominant payment channel.

In summary: The Nigerian payment system has undergone a structural transition, with POS emerging as the dominant electronic payment channel in both transaction volume and value, strongly outpacing ATM usage.

Conclusion

The results of this study provide compelling evidence of a clear structural transition within Nigeria's payment system between 2012 and 2023. While ATM transactions maintained steady but modest growth, POS transactions witnessed an exponential surge in both transaction volume and value. The regression analysis revealed that growth in ATM transactions significantly predicts POS expansion, with more than 80 percent of the variation in POS explained by ATM activity, albeit at a much higher scale of adoption. The paired t-test further confirmed that POS growth rates—whether in terms of transaction numbers or values—far exceeded those of ATM transactions at statistically significant levels. Collectively, these findings underscore the growing preference among Nigerian consumers and merchants for POS channels. This shift not only highlights the effectiveness of the cashless policy but also reflects broader trends in digital financial inclusion and the modernization of payment systems.

Recommendations

To consolidate and sustain this structural transition, several measures are essential. First, there is a need to strengthen POS infrastructure, particularly in rural and peri-urban areas where access remains limited. Expanding the availability of POS terminals will ensure that the benefits of digital payments reach underserved populations. Equally important is the improvement of transaction reliability: as adoption accelerates, robust

ICT infrastructure, seamless networks, and reduced incidences of failed transactions are vital to maintaining user trust. Furthermore, merchants require adequate support through incentives such as reduced transaction fees, faster settlement periods, and targeted financial literacy programs, all of which will encourage more small businesses to embrace POS technology. In parallel, banks should begin rationalizing ATM deployments in recognition of slowing growth trends, gradually redirecting resources toward POS and mobile platforms while still catering for cash-dependent users. Finally, with rising POS adoption comes the heightened risk of cybercrime; regulators and service providers must, therefore, enforce strong cybersecurity measures, enhance fraud monitoring, and strengthen consumer protection frameworks.

Policy Implications

The findings of this study carry significant implications for policy and practice. The strong migration toward POS transactions provides empirical validation of the Central Bank of Nigeria's cashless policy as a critical driver of digital payment adoption. Policymakers should therefore build on this momentum by further incentivizing electronic payments while discouraging excessive reliance on cash. Beyond this, the POS revolution underscores its potential as a tool for financial inclusion, particularly in bridging access gaps in underserved communities. It is, therefore, imperative that POS deployment targets be integrated into Nigeria's national financial inclusion strategy. As POS increasingly dominates retail payments, stronger regulatory oversight will be required to safeguard consumer rights, ensure fair pricing, and maintain competitive balance within the system. At a broader level, the rapid rise of POS signals an ongoing transformation of Nigeria's digital economy. Policymakers must embed this transition into digital economy frameworks, fostering innovation and providing enabling environments for fintech growth. Finally, the expansion of the POS ecosystem offers new opportunities for job creation, entrepreneurship, and youth engagement. By strategically harnessing this trend, government and private sector actors can transform the payment system into a platform for economic empowerment and sustainable development

References

Bank for International Settlements (BIS), Committee on Payment and Settlement Systems. (2001). Core principles for systemically important payment systems (CPSS Publication No. 43). Bank for International Settlements.

Bank for International Settlements (BIS), Committee on Payment and Settlement Systems. (2006). General guidance for national payment system development (CPSS Publication No. 70). Bank for International Settlements.

Bank for International Settlements (BIS), Committee on Payments and Market Infrastructures & World Bank Group. (2016). Payment aspects of financial inclusion. Bank for International Settlements

International Monetary Fund. (2019). The Rise of Digital Money (IMF Fintech Note 19/01). IMF.

Bank for International Settlements (BIS), CPSS. (2003). The role of central bank money in payment systems (CPSS Publication No. 55). Bank for International Settlements

Central Bank of Nigeria (CBN). (2012). Cashless policy guidelines. Retrieved from www.cbn.gov.ng.

Central Bank of Nigeria (CBN). (2020). Payment's system vision 2020. Retrieved from www.cbn.gov.ng.

Central Bank of Nigeria (CBN). (2022). Annual report on electronic payment systems Retrieved from www.cbn.gov.ng.

Central Bank of Nigeria (CBN). (2022). Cashless policy guidelines. Retrieved from www.cbn.gov.ng.

Central Bank of Nigeria (CBN). (2022). Financial inclusion strategy. Retrieved from www.cbn.gov.ng.

Central Bank of Nigeria (CBN). (2022). Regulatory updates on cashless policy. Retrieved from www.cbn.gov.ng.

Hassan, Y, & Ibrahim, M. (2021). Technological innovations in payment systems. International Journal of Digital Finance, 7(1), 34–51.

Lawal, M., & Johnson, R. (2021). Merchant perspectives on POS adoption. Journal of Retail Finance,10(3), 90–112.

Monye, O. (2024). Cashless policy initiative in Nigeria: Outline of crucial socio-economic and regulatory considerations. Journal of Money Laundering Control, *27*(3), 445– 458.Emerald Publishing.

Ojo, T., & Balogun, S. (2023). Comparative analysis of ATM and POS systems in Nigeria African Journal of Banking and Finance, 12(4), 267–289.

Oladeji, T. & Bello, A. (2020). Economic implications of POS adoption in Nigeria. African Economic Review, 15(6),78–91.

Olatunji, E. (2023, February 20). Cybercrime seen as drawback to cashless economy. BusinessDay NG

Taiwo, J., & Okeke, N. (2023). The future of payment systems in Nigeria. Journal of E Emerging Markets, 8(5), 321–340.

World Bank. (2020). Digital economy and financial inclusion: Insights from emerging Markets. Retrieved from www.worldbank.org.