

The Role of Financial Technology in Enhancing Financial Inclusion in Nigeria

Basheerah Adewumi Qazeem^{1,*}

¹Department of Banking and Finance, Olabisi Onabanjo University, Ago-Iwoye, Ogun State, Nigeria.
qazeembasheerah@gmail.com¹

Abstract: This study examined the impact of financial technology on financial inclusion in Nigeria, focusing on three key variables: Automated Teller Machines (ATMs), Point of Sale (POS) systems, and Internet banking. The study utilizes a quantitative research approach and employs a descriptive research design to analyze secondary data from 2014 to 2016 sourced from the Nigerian Inter-Bank Settlement System (NIBSS) Annual Reports and the Central Bank of Nigeria Statistical Bulletin. Regression analysis using E-views software was conducted to analyze the data. The findings highlight a consistent expansion of digital channels within Nigeria's financial sector, including ATM, POS, and Internet banking. The increasing number of bank accounts indicates a substantial and positive impact on financial inclusion. The study concludes that expanding digital channels, including ATM, POS, and Internet banking, has benefited financial inclusion in Nigeria. It highlights the importance of these channels in improving access to financial services, particularly in rural areas. The study recommends an increased focus on expanding access to ATM and POS transactions, improving networking for effective Internet banking usage, and promoting financial literacy to enhance financial inclusion.

Keywords: Financial Inclusion; Financial Technology; Automated Teller Machine; Point of Sale; Internet Banking; Expanding Access; Descriptive Research Design; Bank Settlement System; Economic Growth; Nigerian Inter-Bank Settlement System (NIBSS).

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1. Introduction

Financial inclusion plays a pivotal role in reducing poverty and promoting economic growth [1]. It refers to making financial services accessible to all individuals, especially those from underserved or marginalized groups [2]. This ensures that everyone, regardless of their wealth or business size, can benefit from essential financial services, such as savings, credit, and insurance [3]. The importance of financial inclusion has gained global recognition, particularly in Africa, where countries are striving to provide equitable access to financial services for all individuals. According to Mader [24], financial inclusion involves establishing financial services that can be accessed by individuals and businesses, regardless of their wealth or scale. Globally, approximately 2.5 billion adults remain unbanked, representing nearly half of the adult population, with the majority residing in developing regions such as Asia, Africa, Latin America, and the Middle East [5]. Many individuals live on less than \$5 per day in these areas. For instance, in Nigeria, the % of individuals without access to financial services was estimated at 46.3% in 2010 [6]. Despite improvements over the years, data from the EFInA Financial Services in Nigeria 2020 survey projected that

by 2020, only 64% of adult Nigerians would engage with financial services [7]. This excludes about 38 million Nigerians, or 36% of the adult population, from the formal financial system. Recognizing financial inclusion's critical role in fostering inclusive and sustainable growth, the Nigerian government, in partnership with the Central Bank of Nigeria, has implemented various regulations to facilitate widespread and affordable access to financial services, particularly targeting the most marginalized populations [9]. The adoption of financial technology (FinTech) has played a significant role in enhancing financial inclusion by leveraging digital tools to reduce barriers to access, improve service delivery, and reduce transaction costs [10]. FinTech refers to technological advancements in the financial sector that utilize digital channels to deliver financial services, complementing traditional methods. The integration of FinTech holds the potential to enhance the accessibility and usage of financial services, thereby promoting financial inclusion. In Nigeria, the advent of digital technology in the financial sector has significantly transformed how financial services are accessed and utilized. However, there is ongoing debate regarding the true extent of its impact on improving accessibility and participation within the sector [11].

The rapid expansion of the fintech sector has revolutionized the financial services market by eliminating traditional barriers to access [15]. The ability to easily save money, obtain credit, and manage debt is vital for long-term economic growth and prosperity [16]. As financial inclusion becomes a central focus of economic development efforts globally, it is essential to understand the role of Fintech in this process, particularly in developing economies like Nigeria. While FinTech has the potential to bridge the financial inclusion gap, it is crucial to assess its actual impact and identify the challenges that may hinder its effectiveness. This study explores the influence of financial technology on financial inclusion in Nigeria. With the ongoing advancement of digital technologies in the financial services sector, it is imperative to evaluate the role of fintech initiatives in enhancing access to financial services in Nigeria [19]. This research investigates the relationship between financial technology and inclusion, particularly on automated teller machines (ATMs), online banking, and point-of-sale (POS) systems. By examining recent data, this study will provide insights into the effectiveness of these technologies in expanding financial inclusion in Nigeria.

The findings of this study are expected to provide valuable contributions to the existing body of knowledge, particularly regarding the intersection of financial technology and financial inclusion in a developing economy. This research will offer empirical evidence to inform policymakers, government agencies, and financial institutions, especially the Central Bank of Nigeria, designing and implementing strategies to increase financial inclusion [22]. The results will also serve as a guide for future research on the role of Fintech in promoting financial inclusion and the challenges that remain in achieving comprehensive financial access for all [23]. By addressing the financial inclusion gap, this study also emphasizes the broader implications of improving financial access, which can lead to enhanced economic development, reduced poverty, and improved quality of life for marginalized populations. Through its findings, this research offers recommendations for enhancing the effectiveness of fintech initiatives and policies to reduce the number of unbanked individuals in Nigeria, ultimately fostering a more inclusive and sustainable financial system [25].

2. Literature Review and Theoretical Framework

2.1. Financial Inclusion

Financial inclusion does not have a universally accepted definition, as it varies depending on country requirements, physical location, socio-economic development, and cultural factors. The Alliance for Financial Inclusion defines financial inclusion as “a state in which all people who can use them have access to a full suite of quality financial services, provided at affordable prices, in a convenient manner, and with dignity for the clients.” The World Bank echoes this sentiment, emphasizing financial inclusion as vital for reducing poverty and fostering inclusive economic growth. Through access to financial services, individuals can secure loans for education, investment, and risk management [29].

Defines financial inclusion as providing basic banking services at affordable costs, especially to marginalized and low-income groups who typically lack access to formal banking systems. Similarly, the Consultative Group to Assist the Poor describes financial inclusion as a state where everyone can access various financial services at affordable prices from diverse providers with respect and dignity. It encompasses services like banking, credit, insurance, and investment, which enable individuals to accumulate savings, manage risks, and improve their financial well-being. Financial inclusion is also pivotal in combating poverty, advancing social mobility, and stimulating economic growth [26].

2.1.1. Benefits of Financial Inclusion

Highlights several benefits of financial inclusion, noting that financial services enable customers to open bank accounts, access various financial products, and engage in cost-effective remittances and credit-based purchases. This fosters economic activity and simplifies regulatory compliance. Financial inclusion also enhances transparency, reduces fraud, and encourages economic stability [28]. Saddam [31] posits that financial inclusion stimulates economic activities, boosts national productivity, and

reduces poverty. He links financial exclusion in Nigeria to rising poverty levels, stressing that enabling the 70% of Nigerians living below the poverty line to access financial services is essential for sustained growth and development. Financial inclusion thus empowers low-income individuals with enhanced borrowing, saving, and repayment capabilities, contributing to broader economic activities.

2.1.2. State of Financial Inclusion in Nigeria

Nigeria's financial inclusion state is frequently analyzed through data from the EFINA Access to Financial Services surveys. According to the EFINA 2020 survey, 51% of Nigerians utilize formal financial services, including banking, microfinance, mobile money, insurance, and pension accounts—an increase from 49% in 2018. However, Nigeria's National Financial Inclusion Strategy, which aimed for 70% financial inclusion by 2020, was not fully achieved. The inclusion rate was 64%, indicating that approximately 38 million adults, or 36% of the population, remain excluded from the financial system [30].

2.2. Financial Technology (Fintech)

Fintech, or financial technology, has significantly impacted how financial services are delivered, particularly in emerging markets like Nigeria. Traditionally, banking in Nigeria was dominated by savings, commercial, and microfinance institutions. However, the advent of Fintech has introduced innovative solutions that offer financial services through mobile phones, the internet, and other digital platforms. Fintech can revolutionize financial services by increasing access, affordability, and convenience for a broader population.

According to the World Bank [29], Fintech can provide creative solutions to financial inclusion challenges, especially for underserved populations. Fintech initiatives can bridge the gap between the unbanked and formal financial systems, offering services like mobile payments, digital wallets, and peer-to-peer lending. Originally, Fintech referred to the technology used behind the scenes in financial institutions. However, its modern iteration focuses on consumer-facing services that leverage mobile technology and telecommunications infrastructure to offer banking, investment, insurance, and other financial products. This shift has made Fintech a transformative force in the financial sector.

2.3. Types of Fintech Payment Systems Adopted in the Study

Automated Teller Machines (ATMs): ATMs are self-service devices that allow users to conduct various banking transactions, including withdrawals, deposits, loan payments, and transfers. They provide a high level of convenience, especially in areas lacking full-service bank branches. While basic ATMs offer essential services such as cash withdrawals and account balance updates, more advanced models offer additional features like account deposits and bill payments. The widespread use of ATMs has improved accessibility to financial services, particularly in urban areas, reducing the burden of visiting physical bank branches.

Internet Banking: Internet banking, or online banking, enables users to access and manage their bank accounts over the Internet. According to the World Bank [29], internet banking offers a cost-effective and convenient way for customers to perform banking tasks such as transfers, bill payments, and account management. This platform has gained traction, especially among rural areas, offering a viable alternative to traditional banking systems and facilitating greater financial inclusion.

Point of Sale (POS) Systems: POS systems process payments during transactions, typically in retail environments. A POS system combines hardware (card readers) and software to manage payments and provide transaction records. In Nigeria, POS systems have become increasingly popular, particularly in urban areas, due to their ability to process transactions quickly and efficiently. POS terminals have been pivotal in addressing ATM malfunctions, cash shortages, and long wait times. Despite some challenges, such as limited ATM availability during peak periods, POS systems continue to enhance the accessibility of financial services.

2.4. Theoretical Review

2.4.1. Financial Innovations Theory

The Financial Innovations Theory, proposed by Ugwuanyi and Okore [18], posits that expanding financial services by institutions is key to achieving financial inclusion. This theory suggests that limitations in the existing banking model, such as information asymmetry and the high costs of maintaining physical branches, have prompted the emergence of financial innovations. Financial technologies, including mobile and digital financial services, enhance the financial industry's ability to deliver services efficiently and profitably, driving economic transformation. These innovations increase liquidity in financial markets, facilitate the transfer of financial assets to those in need, and expand the availability of financial products. However,

the theory has its critics. It assumes that financial innovations always result in lower costs, which is not always the case. For instance, innovations can lead to new social issues like cybercrime, where financial data is exploited maliciously. Additionally, while financial innovations may facilitate inclusion, they can exacerbate economic inequality, as those with existing wealth may benefit more from these innovations than the disadvantaged.

2.4.2. Technology Acceptance Model

The Technology Acceptance Model (TAM), introduced by Davis [13], explains individuals' willingness to adopt new technologies based on their perceptions of ease of use (PEOU) and usefulness (PU). TAM suggests that users' decisions to adopt technology are influenced by their beliefs about how beneficial and easy it is to use. Users are more likely to embrace new technology if they perceive it will improve their performance. TAM emphasizes that users' behavioural intentions influence their actual use of technology. Perceived ease of use and perceived usefulness directly affect users' decisions to adopt new systems Lim and Ting [4] However, + TAM primarily focuses on individual factors like user perceptions, which may not fully account for broader influences such as regulatory or institutional factors affecting technology adoption.

2.4.3. Diffusion of Innovation Theory

The Diffusion of Innovations (DOI) theory, proposed by Hassanuddeen [14], examines how innovations spread over time through various social systems. According to DOI, the adoption of innovations is influenced by factors such as relative advantage, compatibility, complexity, trialability, and observability. Individuals are categorized into groups based on their innovativeness, including innovators, early adopters, early majority, late majority, and laggards [12]. The theory suggests that innovations spread through communication channels within social systems. However, it has limitations. It focuses on the attributes of the innovation itself and may overlook the broader social, economic, and political contexts that affect adoption. It also does not fully address the role of institutions and culture in innovation diffusion. Davis's Technology Acceptance Model (TAM) is the most appropriate framework for this study. This model is particularly relevant in Nigeria, where challenges related to technology adoption are significant. TAM is well-suited to understand how users perceive and accept technological innovations in banking and finance, which is crucial for achieving financial inclusion.

2.5. Empirical Review

Numerous empirical studies have examined the impact of financial technology (FinTech) on financial inclusion in developing economies, particularly in sub-Saharan Africa. These studies have generally highlighted a positive and significant relationship between digital financial services and access to formal financial systems. For instance, Studied the role of ATM usage in enhancing customer access to financial services in Nigeria. They found that ATM banking significantly reduced the unbanked population, particularly in urban areas. In a related study, mobile banking assessed adoption and its influence on banking penetration, concluding that mobile platforms expanded access to financial services among low-income earners.

Explored the effects of mobile banking and agency banking on financial inclusion. Their findings emphasized that mobile banking was major in driving inclusion among rural dwellers. In contrast, agency banking helped address the distance and cost-related barriers to accessing banking services. Coulibaly [21] also confirmed that agency banking offered a cost-effective means of reaching underserved populations, especially where bank branches were scarce. In Kenya, analyzed the impact of mobile money services like M-Pesa on financial inclusion. Their results revealed a significant increase in formal financial participation, particularly for those previously excluded from the banking sector. Explored the relationship between FinTech development and financial inclusion in Nigeria using data from commercial banks. The study found that innovations such as online banking and point-of-sale (POS) terminals significantly increased financial access. Similarly, we investigated the role of Internet banking in improving banking efficiency and user access, revealing a strong relationship between the use of Internet-based platforms and improved banking participation.

Furthermore, we analyzed the effect of fintech services on access to credit and savings among small businesses and informal sector participants. The study highlighted that digital lending platforms, mobile wallets, and POS services offered flexible, user-friendly options encouraging financial participation. Despite the wide body of literature affirming the positive impact of financial technology on financial inclusion, a significant portion of existing studies tends to emphasize individual components of Fintech, such as mobile banking or agency banking, without accounting for the collective or comparative effect of multiple FinTech tools. As a result, there is a research gap concerning the integrated analysis of various fintech instruments such as ATM banking, POS terminals, and Internet banking within the same model. This study addresses this limitation by adopting a multi-dimensional approach to Fintech and its influence on financial inclusion, using Nigeria as a case study. This broader perspective is expected to provide a more nuanced understanding of how different fintech tools interact to drive inclusive finance.

3. Methodology

The study employs a quantitative approach, specifically adopting a descriptive research design. This design is suitable as it allows for collecting numerical data and applying statistical techniques to evaluate the relationship between fintech innovations and financial inclusion in Nigeria. Through this approach, the study aims to identify patterns, trends, and correlations within the data from 2014 to 2021. The research focuses on selected indicators of financial technology—namely Point of Sale (POS) transactions, Automated Teller Machines (ATMs), and Internet Banking—as these represent some of the country's most significant and widely adopted digital financial channels. The study population consists of fintech-related services provided by Nigerian deposit money banks. These variables were selected due to their direct relevance to the expansion of financial access, usage, and efficiency in Nigeria.

Data for the study were obtained from secondary sources, including publicly available and credible publications such as the Central Bank of Nigeria (CBN) Statistical Bulletin, annual reports of the Nigerian Inter-Bank Settlement System (NIBSS), and other official databases that provide comprehensive statistics on digital financial services. These sources contain detailed information on the extent of fintech adoption and various financial inclusion indicators, including access to banking services, frequency of transactions, and volume of electronic payments. To analyze the data, the study specifies a multiple regression model, where financial inclusion is the dependent variable and POS transactions, ATM usage, and Internet Banking serve as independent variables. The general form of the model is:

$$FIN = \beta_0 + \beta_1 POS + \beta_2 ATM + \beta_3 INB + \varepsilon$$

Where:

FIN= Financial inclusion, β_0 = Constant term, β_1 , β_2 , β_3 = Coefficients of the independent variables POS, ATM, Internet banking = Independent variables, ε = Error term

In this model, FIN represents financial inclusion, while POS, ATM, and INB stand for Point of Sale, Automated Teller Machines, and Internet Banking, respectively. The coefficients β_1 , β_2 , and β_3 capture the magnitude and direction of the relationship between each fintech variable and financial inclusion, while β_0 represents the constant term and ε denotes the error term. In addition to the general model, the study specifies three separate models to examine the isolated effects of each fintech indicator on financial inclusion. These simplified models help identify the individual contribution of each digital channel to the overall financial inclusion landscape.

To evaluate the impact of ATMs on financial inclusion, the model is specified as:

$$FIN = \beta_0 + \beta_2 ATM + \varepsilon$$

Where:

FIN= Financial inclusion, β_0 = Constant term, $\beta_2 ATM$ =Coefficient of ATM, ε = Error term

Similarly, to assess the effect of Internet Banking, the model is expressed as:

$$FIN = \beta_0 + \beta_3 INB + \varepsilon$$

Where:

FIN=Financial inclusion, β_0 = Constant term, $\beta_3 INB$ =Coefficient of Internet banking, ε = Error term

To examine the influence of POS transactions on financial inclusion, the model becomes:

$$FIN = \beta_0 + \beta_1 POS + \varepsilon$$

Where:

FIN=Financial inclusion, β_0 = Constant term, $\beta_1 POS$ =Coefficient of POS, ε = Error term

These individual models provide deeper insights into each component of Fintech in advancing financial inclusion independently of the others.

The data analysis for this study involves both descriptive and inferential statistics. Descriptive statistics, such as the mean, standard deviation, minimum, and maximum values, are used to summarize and present the characteristics of the data. Inferential analysis uses multiple regression analysis to test the hypotheses and determine the strength and significance of the relationships between the dependent and independent variables. EViews software performs the statistical analysis, ensuring accurate computation and robust econometric modelling. By adopting this methodological approach, the study seeks to provide evidence-based insights into the role of fintech innovations in promoting financial inclusion in Nigeria. The results of this analysis are expected to inform policymakers, financial institutions, and development stakeholders about the effectiveness of digital financial services in bridging the financial access gap in the country.

4. Data Analysis, Results, and Discussion on Findings

The research methodology involved collecting secondary data from the CBN Statistical Bulletin Report. This data was analyzed to examine the impact of financial technology on financial inclusion in Nigeria. The analysis aligned with the research objectives and presented the findings accordingly.

4.1. Presentation of Descriptive Statistic

Table 1 below presents the descriptive result of the variables employed in this research work.

Table 1: Descriptive statistics of the variables employed

	Maximum	Minimum	Mean	Std. Deviation	Skewness	Kurtosis
ATM(BLN)	21,230.93	3,681.98	7,484.35	5,742.76	1.82	3.15
POS(BLN)	24,455.41	312.07	2,631.73	7,123.54	2.60	6.31
Internet banking (BLN)	404.60	1.03	71.70	116.60	2.52	7.38
NIP(BLN)	105,222.56	11,030.96	52,360.84	39,874.55	0.65	1.57
NEFT(BLN)	410,171.4	11,030.96	75,085.21	137,427.88	2.79	8.20
No of MBank Accounts (MLN)	114.8	62.25	79.69	19.72	-0.08	-0.69

Source: Researcher's E-views Results

Table 1 analyzed the effects of different variables employed in this study to improve the number of bankable individuals in the Nigerian banking sector. We may see the following from the descriptive statistics table above: For ATM transactions, the mean value is 7,484.35 billion, with a standard deviation of 5,742.76 billion. The data is positively skewed, as evidenced by the skewness value of 1.82, which indicates that there are more values towards the lower end of the distribution. The kurtosis value of 3.15 indicates that the data is moderately peaked. For POS transactions, the mean value is 2,631.73 billion, with a standard deviation of 7,123.54 billion. The data is highly positively skewed, as evidenced by the skewness value 2.60, indicating a few extremely high values in the distribution. The kurtosis value of 6.31 indicates that the data is highly peaked. For internet transactions, the mean value is 71.70 billion, with a standard deviation of 116.60 billion. The data is highly positively skewed, as evidenced by the skewness value 2.52, indicating a few extremely high values in the distribution. The kurtosis value of 7.38 indicates that the data is highly peaked.

NIP (NIBSS Instant Payments System) transactions have a mean value of 52,360.84 billion, with a standard deviation of 39,874.55 billion. The data is positively skewed, as evidenced by the skewness value of 0.65, which indicates that there are more values towards the lower end of the distribution. The kurtosis value of 1.57 indicates that the data is moderately peaked. For NEFT (National Electronic Payment Service) transactions, the mean value is 75,085.21 billion, with a standard deviation of 137,427.88 billion. The data is highly positively skewed, as evidenced by the skewness value 2.79, indicating a few extremely high values in the distribution. The kurtosis value of 8.20 indicates that the data is highly peaked.

4.2. Data Analysis

Table 2: Regression result for the variables employed

	Coefficient	Std. Error	t-Statistics	P-value
ATM	0.265	0.44	6.040	0.000
POS	0.101	0.023	4.340	0.000
Internet banking	0.166	0.051	3.280	0.003

NIP	0.478	0.088	5.440	0.000
NEFT	0.001	0.000	4.000	0.000
Intercept	31.004	3.778	8.200	0.000

Source: Researcher's E-views Results

The regression equation is:

$$\text{No. of bank accounts} = 0.265(\text{ATM}) + 0.101(\text{POS}) + 0.166(\text{Internet}) + 0.478(\text{NIP}) + 0.001(\text{NEFT}) + 31.044$$

4.2.1. Interpretation of the results

The results of the regression between the dependent variable (number of bank accounts) and the independent variables (ATM, POS, Internet banking, NIP, and NEFT) are displayed in Table 2. When all other variables are held constant, the coefficients for each independent variable show how much of a change in the dependent variable results from an increase in the independent variable of one unit. The findings demonstrate that each independent variable's relationship to the dependent variable is statistically significant. The positive correlations for ATM, POS, Internet banking, NIP, and NEFT all show that an increase in each factor is linked to an increase in bank accounts. The expected value of the dependent variable is represented by the intercept term of 31.044 when all independent variables are present. Overall, the results suggest that the availability and use of various banking services (ATM, POS, Internet banking, NIP, and NEFT) positively affect the number of bank accounts in Nigeria.

4.2.2. Testing of Hypothesis

To test the hypotheses, a linear regression model was used with the dependent variable “No of bank accounts” and the independent variables “ATM(Billion)”, “Internet (Billion)”, and “POS(Billion)”. Using the following regression equation:

$$\text{No. of bank accounts} = \beta_0 + \beta_1\text{ATM(BLL)} + \beta_2\text{Internet (Billion)} + \beta_3\text{POS(Billion)} + \varepsilon$$

Where:

β_0 is the intercept term, β_1 is the coefficient for ATM(Billion), β_2 is the coefficient for Internet (Billion), β_3 is the coefficient for POS(Billion), and ε is the error term.

The null hypothesis for each hypothesis test is that the respective independent variable does not have a significant effect on financial inclusion in Nigeria, that is:

H0: $\beta_1 = 0$ (for H1),
H0: $\beta_2 = 0$ (for H2), and
H0: $\beta_3 = 0$ (for H3).

The alternative hypothesis for each test is that the respective independent variable does have a significant effect on financial inclusion in Nigeria, that is:

H1: $\beta_1 \neq 0$ (for H1),
H1: $\beta_2 \neq 0$ (for H2), and
H1: $\beta_3 \neq 0$ (for H3)

Using a significance level of 0.05 for each hypothesis test.

The results of the hypothesis tests are presented in Tables 3,4 and 5 below.

4.2.3. Hypothesis One Testing

Table 3: Regression results for hypothesis $H_1 = \text{ATM}$

Hypothesis	Coefficient	Std.Error	t-Statistics	P-value	Conclusion
$H_1 = \text{ATM}$	0.001	0.000	6.172	0.000	Reject H_0

Source: Researcher's Analysis in 2023

Specifically, the coefficient for ATMs is positive and statistically significant, indicating that an increase in ATM usage is associated with an increase in the number of bank accounts, which alternatively enhances financial inclusion in Nigeria.

4.2.4. Hypothesis Two Testing

Table 4: Hypothesis testing results for Internet banking adoption

Hypothesis	Coefficient	Std.Error	t-Statistics	P-value	Conclusion
H ₂ =Internet banking	0.244	0.077	3.181	0.005	Reject H ₀

Source: Researcher's Analysis in 2023

The coefficient for Internet banking is also positive and statistically significant, suggesting that an increase in Internet banking usage is associated with an increase in the number of bank accounts, which alternatively enhances financial inclusion in Nigeria.

4.2.5. Hypothesis Three Testing

Table 5: Hypothesis testing results for pos usage

Hypothesis	Coefficient	Std.Error	t-Statistics	P-value	Conclusion
H ₃ =POS	0.099	0.003	37.697	0.000	Reject H ₀

Source: Researcher's Analysis in 2023

Finally, the POS coefficient is the largest of the three and statistically significant, indicating that a rise in POS usage is substantially correlated with an increase in bank accounts, which improves financial inclusion in Nigeria.

4.3. Discussion of Findings

The first hypothesis, which examines the influence of ATM usage on financial inclusion, demonstrates a positive and statistically significant relationship. This suggests that increased ATM usage corresponds to more bank accounts, ultimately promoting financial inclusion. This finding aligns with a study by Monyoncho [17], which also emphasized the role of ATM usage in enhancing financial inclusion. The study indicates that ATMs provide convenience and time savings for users, allowing them to perform banking transactions quickly and easily, thus promoting financial inclusion. This result, however, goes against that of those who found that a rise in bank branches may not always result in a rise in financial inclusion, particularly if those new branches are situated where other banks already have locations. Financial inclusion would, therefore, increase when new accounts for those who are now unbanked open where there are bank branches where no current banks operate.

The second hypothesis focuses on the impact of Internet banking on financial inclusion. The results reveal a positive and statistically significant coefficient for Internet banking, indicating that its usage is associated with more bank accounts and improved financial inclusion in Nigeria. These findings support the research conducted by Lule et al. [27], who also found that Internet banking facilitates easier access to financial services, particularly in underserved areas. These results support those who found that Internet banking has improved financial inclusion by giving people easier access to financial services, particularly in underserved areas.

The third hypothesis examines the impact of Point of Sale (POS) systems on financial inclusion in Nigeria. The results reveal that the coefficient for POS usage is the largest among the three variables and is statistically significant. This indicates that an increase in POS usage is closely associated with a rise in the number of bank accounts, thereby improving financial inclusion in Nigeria. The widespread adoption of POS systems has allowed people to conduct transactions without the need to physically visit a bank, contributing to increased convenience and accessibility. This technological advancement has not only simplified operations but has also generated employment opportunities for the country. These findings align with the research conducted by Ene et al. [8], who similarly found that POS systems have a significant and favorable impact on financial inclusion in Nigeria. The study acknowledges the extensive use of POS systems to complete transactions, highlighting its positive influence on expanding financial access.

Additionally, the study aligns with the research conducted by Kamau [20], which focused on Point-of-Sale systems and financial inclusion in Nigeria. Their study emphasizes the significant role of POS systems in promoting the adoption of digital payments, thereby enhancing financial inclusion by enabling individuals to engage in digital transactions and access a broader range of financial services. This study indicates that electronic payment methods, including ATMs, point-of-sale terminals, and

online banking, significantly affect financial inclusion in Nigeria. The results show that the COVID-19 pandemic has increased the use of digital payments nationwide. This underlines the need to encourage electronic payment systems to increase financial inclusion and foster economic growth.

5. Summary, Conclusion and Recommendations

As a result of attempts to improve access to financial resources, sustain inclusive growth, and encourage saving among the underprivileged and poor, most nations around the world, particularly in Africa, are growing more interested in financial inclusion. Customers' displeasure with the financial services business is mostly a result of bad user experiences, challenging access to financial services, particularly in rural areas, and pricing difficulties. Therefore, the study examined Fintech's impact on financial inclusion in Nigeria. The findings of this study were discussed in detail, and the study's objectives were linked to the current findings of the research. The secondary data was sourced from the Statistical Bulletin of the Central Bank of Nigeria (CBN), the Annual Reports of the Nigerian Inter-Bank Settlement System (NIBSS), and other pertinent databases. A quantitative research approach, specifically a descriptive research design, was employed in this study to collect data over eight years, from 2014 to 2016. The study focused on one dependent variable, namely the number of bank accounts, and three explanatory variables—automated teller machine (ATM), point of sale (POS), and internet banking—serving as proxies for the independent variable (financial technology).

In conclusion, the data analysis demonstrates a constant expansion of digital channels inside Nigeria's financial sector, including ATM, POS, and online banking. Over time, the increasing number of bank accounts proves that this growth has benefited and significantly impacted financial inclusion. The study demonstrates a strong and statistically significant association between the usage of digital channels and financial inclusion in Nigeria, showing the crucial role adopted and utilized by these channels in fostering financial inclusion. The study found a statistically significant positive correlation between the use of digital channels and financial inclusion in Nigeria, suggesting that increasing financial inclusion has depended heavily on adopting and using these channels. In response to these findings, several recommendations are proposed. First, there is a need to expand access to ATM and POS services, especially in rural and underserved communities. Policymakers and financial institutions should prioritize the deployment of these facilities in regions where traditional banking services are scarce. Second, the government should invest in robust Internet infrastructure to support and encourage the use of Internet Banking, particularly in remote areas where network coverage remains weak. Third, efforts must be made to enhance financial literacy among the population. Awareness campaigns and educational programs should be initiated to ensure that individuals, especially in rural areas, are equipped with the knowledge and confidence to utilize digital financial services effectively. Lastly, regulatory support, financial incentives, and technical assistance should strengthen microfinance institutions. These institutions are instrumental in delivering financial services to small and medium-sized enterprises and other marginalized groups, thus contributing significantly to national financial inclusion goals.

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Ethics and Consent Statement: The research was conducted in compliance with ethical standards. Informed consent was obtained from all participants, ensuring their privacy, security, and voluntary involvement.

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