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EFFECT OF DIGITAL FINANCIAL SERVICES AND FINANCIAL INCLUSION IN THE DEVELOPMENT OF THE NIGERIA ECONOMY

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Abstract

Digital financial services and financial inclusion served as one aspects for he development of the economy of any Nation hence Nigeria was not an exception to this fact. This study invested this aspect with some empirical reviews which culminated to the outlook of the objectives for the study with some empirical reviews. The methodology included adoption of the descriptive survey design conducted in Makurdi and Jos metropolises of Benue State and Plateau State. The population of the study was 2024 of Bank Staff, Bank Customers, Financial Analysts, Academics, Traders and Policy Makers. The whole population was used and the selection of the respondents was by the researcher visiting Makurdi and Jos metropolises formed into strata within one month two weeks. The source of data was primary and collected by a self-administered questionnaire of both open-ended and close-ended questions. The five-point Likert-scale was used. The instrument was validated. The method of data analysis was by Chi-square statistical tool employed to test the hypotheses to see deviations of the actual observations (observed frequency) from the expected. Finding showed that there are positive significant effects of POS transactions, USSD-based transactions, ATM-based transactions, as functions of financial inclusion on the development of the Nigeria economy. In conclusion, for the development of the Nigeria economy based on

Key words: Digital, Financial, Services, Inclusion, Development, Nigeria

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financial services and financial inclusion, the development would be enhanced when the various financial services work together and availability of various digital channels, robust infrastructure, and supportive policies that would ensure affordability, reliability, and accessibility of digital financial services to the unbanked and under banked. Recommended were that POS Infrastructure should be strengthened, there should be expansion of USSD accessibility and there should be a repositioning of ATMs. These would extend their utility beyond cash dispensing.

INTRODCUSTION

Financial sector in Nigeria has gone through interesting transformations, probably to effect some standing changes for organizational growth and subsequent economic development in Nigeria vis a vis advance digital technology. It could be said that Digital Financial Service (DFS) is composed of services done outside the banking services hall; mobile money, internet banking, agent banking, electronic payment platforms, and other fintech innovations have redefined how customers and users consider the activities financial systems in Nigeria and all over the world.

There have been concerns in the advanced and non-advanced emerging economies that DFS have become very useful and commendable weapons for tackling the hindering forces for satisfactory banking services (Oluwatolani, Adeyemi, & Yusuf, K. (2021). Good to notice that these activities of services have brought in quick, speed, convenience, and cost-efficiency to banking transaction, thereby enhancing users perform banking financial activities without the constraints of time or location (Chiwunze & Mishi, 2020). World over, the combined activities DFS growth and banking financial inclusion has defined, increasing show that access to affordable and reliable financial services not only supports household stability but also drives entrepreneurship, job creation, and inclusive economic growth (Adeoti & Olubiyi, 2020).

In developing economy like Nigeria, DFS has been significant, where earlier form of banking systems have limited reach hence the cost of maintaining all branch activities in remote or low-income areas, along with the tight demands to start banking relationship, made it difficult for more prospects to get into banking chain thereby excluding a larger population from the formal financial system (Oluwatobi & Akinyemi, 2021). Futhermore, leveraging mobile technology and internet connectivity, DFS have been able to bypass these barriers, enabling people to store, send, and receive money, access credit, and even purchase insurance without physical contact with a bank. This shift is not simply about technological innovation it is about financial empowerment. For many households, especially those in rural and peri-urban areas, the availability of a mobile money agent or

digital payment point represents their first real link to the formal economy (Ehigie & Umukoro, 2021). In some countries, DFS adoption gained ground that they help to form policy tool thereby reducing poverty and addressing income inequality.

The evolution of DFS from the Nigerian perspective is a transformative force needing to be investigated if it would economic development haven seen potential to drive inclusive economic development. The Nigerian experience shows that while challenges remain, the right mix of policy support, technological innovation, and targeted outreach can bring millions into the financial system. By continuing to strengthen infrastructure, enhance consumer trust, and promote financial literacy, Nigeria can position DFS as a central pillar in its strategy for sustainable growth and social inclusion (Nkechika, 2022; Adeoti & Olubiyi, 2020; Afolabi & Balogun, 2021)

STATEMENT OF THE PROBLEM

Over the past two decades, digital financial services (DFS) have emerged as transformative tools for expanding financial access, enabling transactions, credit, savings, and insurance delivery through mobile phones, agent networks, and fintech platforms. While global evidence indicates that DFS can reduce transaction costs, expand service reach, and stimulate economic participation (Oluwatobi & Akinyemi, 2021), the reality in many developing economies is more complex. Sub-Saharan Africa, often heralded for its mobile money success stories, still experiences significant exclusion gaps, particularly among rural, low-income, and digitally marginalized groups (Chiwunze & Mishi, 2020).

Nigeria, as Africa's largest economy and most populous nation, presents a paradox. On one hand, it has witnessed rapid growth in fintech innovation, agent banking networks, and mobile payment adoption (Akinola & Alhassan, 2022). On the other, the country's financial inclusion targets remain unmet, with the Central Bank of Nigeria's goal of achieving 95% inclusion by 2024 facing persistent hurdles. Empirical evidence shows that despite the proliferation of DFS channels, many Nigerians remain outside the formal financial system due to infrastructural deficits, digital literacy gaps, socio-cultural barriers, and trust deficits in formal finance (Ehigie & Umukoro, 2021; Oluwatayo & Ojo, 2020).

The disparity between DFS availability and actual usage is a critical concern. Studies reveal that physical access points such as agent banking outlets are unevenly distributed, clustering in urban and peri-urban centers while leaving rural communities underserved (Akinola & Alhassan, 2022). Even where DFS channels are available, poor internet connectivity, unreliable electricity supply, and high service charges deter sustained usage (Adeoti & Olubiyi, 2020). Moreover, financial literacy challenges limit the ability of individuals to engage effectively with increasingly sophisticated digital platforms (Nkechika, 2022).

The persistence of these barriers undermines the inclusive growth potential of DFS. In practice, the technological expansion of financial services in Nigeria has not fully translated into equitable participation in the formal financial system, leaving large sections of the population reliant on informal mechanisms. This situation perpetuates vulnerability, restricts access to credit, savings, and insurance, and inhibits broader economic empowerment (Afolabi & Balogun, 2021).

Therefore, the core problem lies not in the absence of DFS infrastructure or innovation, but in the disconnection between supply and effective, equitable uptake. Bridging this gap requires a nuanced understanding of the interplay between technological provision, socio-economic realities, regulatory frameworks, and user trust. Without addressing these systemic barriers, Nigeria risks entrenching a two-tier financial system digitally.

RESEARCH QUESTIONS

1. What is the effect of POS transactions, a form of DFS, as a function of financial inclusion has on the development of the Nigeria economy?
2. What is the effect of USSD-based transactions, a form of DFS, as a function of financial inclusion has on the development of the Nigeria economy?
3. What is the effect of ATM-based transactions, a form of DFS, as a function of financial inclusion has on the development of the Nigeria economy?

RESEARCH OBJECTIVES

1. To investigate the effect of POS transactions, a form of DFS, as a function of financial inclusion has on the development of the Nigeria economy
2. To investigate the effect of USSD-based transactions, a form of DFS, as a function of financial inclusion has on the development of the Nigeria economy.
3. To investigate the effect of ATM-based transactions, a form of DFS, as a function of financial inclusion has on the development of the Nigeria economy.

HYPOTHESES

HO_1: There is no significant effect of POS transactions, a form of DFS, as a function of financial inclusion has on the development of the Nigeria economy

HO_2: There is no significant effect of USSD-based transactions, a form of DFS, as a function of financial inclusion has on the development of the Nigeria economy

HO_3: There is no significant effect of ATM-based transactions, a form of DFS, as a function of financial inclusion has on the development of the Nigeria economy.

CONCEPTUAL REVIEW

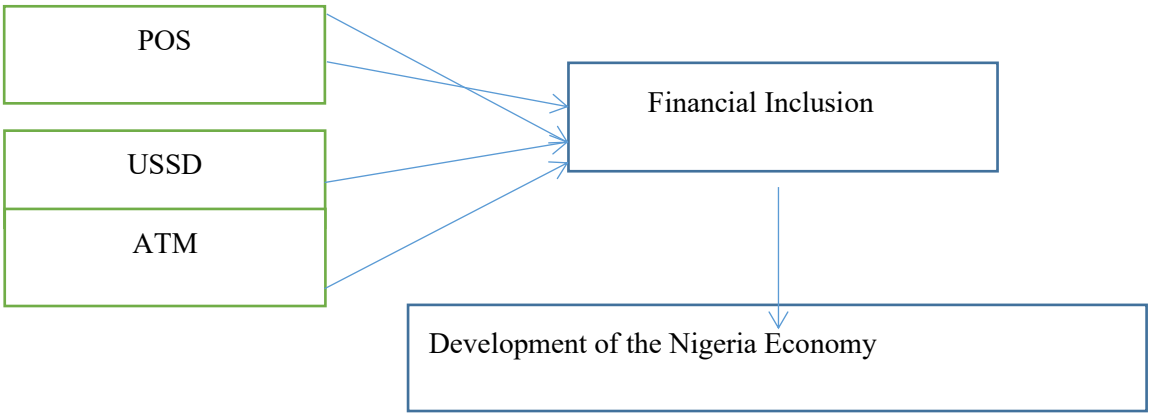
Financial inclusion: This is the provision of easily affordable, accessible, and appropriate financial services to all users, customers, and noncustomers, no matter where they may be located (Ibe & Mbanaso, 2022). Conceptualization of DFS and financial inclusion is

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based on the strength of digital platforms to reach users excluded from formal finance due to factors such as distance from bank branches, lack of formal identification, low income, and limited literacy.

Independent Variables

Figure 1



The concept of Point-of-Sale (POS) Transactions

POS systems have become a critical part of Nigeria's agent banking model, enabling customers to perform deposits, withdrawals, and payments in local communities without visiting a formal bank branch (Okoye, Nwankwo, & Adebayo, 2020). The proliferation of POS terminals has been driven by policies encouraging agent banking and by the entrepreneurial activities of small-scale agents, thereby bridging service gaps in underserved regions.

The concept of (USSD)

This is Unstructured Supplementary Service Data of inclusion tool that helps users conduct banking financial transactions by dialing short numeric codes from any type of mobile phone, without requiring internet access. This low-cost, high-accessibility model has proven especially effective in Nigeria's rural communities, where mobile penetration is high but internet coverage remains inconsistent (Oluwatayo & Adedeji, 2021). Conceptually, the interaction between DFS and financial inclusion is not merely transactional but developmental. Access to digital financial channels facilitates savings, enables credit acquisition, supports micro-enterprises, and improves resilience against economic shocks. In this way, DFS is increasingly viewed as a driver of inclusive growth, with its effectiveness depending on both technological infrastructure and the socio-economic readiness of the target population.

The concept of ATM

This is the Automated Teller Machine that are available for customers and users to effect some banking transactions. It is normally available for use even after the close of banking activities. The machine dispenses cash as applicable, enhance deposits and transfers/

The Access Opportunity Frontier Theory

This theory states the cost of financial services, such as the opening and maintenance of a bank account, the requirement for a minimum deposit, and high administrative expenses, either decreases or increases financial exclusion among financial users. Access to financial services is therefore contingent upon the financial cost of service delivery. The variety of products that financial institutions offer has an impact on both the availability and utilisation of financial services. In this way, the availability of e-products and digital currencies offer unique financial solutions that promote or lessen financial exclusion. Therefore, improving financial inclusion synthesis will involve streamlining the financial services product process and removing obstacles to formal financial products (Claessens, 2006; Beck & De la Torre, 2004).

The Vulnerable Group Theory

This was postulated in Ozili (2020) and is one of the most relevant theories of financial inclusion. The beneficiary theory of financial inclusion is another name for the vulnerable group theory. Vulnerability is defined as the quality of being vulnerable or showing openness or susceptibility to attack or harm. A vulnerable group is a group that is physically or emotionally disadvantaged by events or by the decisions of others such as government, institutions, or individuals. Vulnerability may arise from many sources.

EMPIRICAL

It is good to notice that Nigeria is in the verge of trying to increase financial inclusion haven been dominance in financial exclusion. Before the present measures to enhance financial inclusion, the Nigerian economy was primarily cash-based, with a significant portion of the narrow money stock existing outside the banking system in the form of currency.

In order to encourage Nigerians to use financial institutions and products more, the CBN launched the rural banking programme during this time, ordering banks to open branches in rural regions. The public's trust in the banking sector was damaged by the crisis that occurred in the 1990s. The issue was made worse by the political class's extravagant spending, which raised the amount of money outside the banking system. By the end of the 1990s, the percentage of currency outside the banking system had increased to 47.7%.In an effort to prevent the negative effects of the banking industry crisis in the

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1990s, the government enacted a number of policies. These included measures that deepened the financial sector and included economic reforms aimed at improving the general well-being of the population in terms of employment and income earning capacity. One such measure was the bank consolidation programme of 2004. The percentage of money outside the banking system decreased to 38.2 percent at the end of 2005 as a result of the financial services' increased use.

Adebayo and Salisu (2025), after their study, posited the adoption of mobile banking and its contribution to expanding financial access in Nigeria's urban and semi-urban regions, using a dataset of 4,200 bank customers from Lagos, Kano, and Port Harcourt, their regression analysis showed that mobile banking significantly reduced transactional costs and improved account usage rates, especially among younger demographics. The similarity with the present research lies in the focus on digital banking tools and their measurable effects on financial inclusion. However, their study is limited to urban and semi-urban zones, whereas this study employs a nationwide sample, capturing rural disparities often overlooked.

Okon and Ibrahim (2024) examined the role of USSD platforms in improving access to formal financial services among low-income earners in Nigeria's North-Central states. Employing household survey data and logistic regression, they found that USSD usage positively influenced account ownership and savings frequency, particularly for those without smartphones. This aligns with the present research's interest in USSD as a driver of inclusion, but differs in geographic coverage; our study extends the analysis to all regions, including the oil-producing South-South zone.

In a related study, Amnas and Satyanarayana (2024) investigated how financial technology (FinTech) may advance financial inclusion. By considering the moderating influence of perceived regulatory support and the mediating role of digital financial literacy, this study aimed to understand why consumers use FinTech and how it influences their access to financial services. This study collected data from 608 FinTech users in India and tested the research model using partial least squares structural equation modelling (PLS-SEM). The findings demonstrated the importance of perceived security, trust, and high-quality services in encouraging the use of FinTech services. Additionally, this study showed how FinTech promotes financial inclusion by facilitating people's access to formal financial services. Digital financial literacy has also come to light as a key intermediary between the usage of FinTech and financial inclusion. The study also demonstrated that the association between FinTech and financial inclusion is significantly moderated by perceived regulatory support.

Bamidele et al. (2023) focused on POS agents as a bridging mechanism for unbanked populations in rural Nigeria. Through mixed-methods research combining transaction logs and interviews, they concluded that POS deployment significantly increased access points

for cash withdrawals and transfers. The similarity lies in assessing POS technology's role in inclusion, while the difference is that their work is confined to rural communities, whereas our study also considers urban and semi-urban contexts.

Lawal and Yusuf (2024) analysed web banking adoption and its effect on financial engagement among middle-income Nigerians. Using a sample of 1,500 customers, they demonstrated that web banking enhanced service usage but had lower adoption rates among older users. This is similar to the present study in evaluating web-based channels but differs in excluding low-income users, a demographic central to our research scope.

Chinonso and Eze (2025) assessed the effect of integrating mobile wallets into cooperative savings groups in Eastern Nigeria. Results showed higher savings regularity and reduced reliance on informal lenders. The study aligns with our focus on mobile-based inclusion strategies but diverges in its cooperative-only sample, whereas our work spans individual and group banking behaviours.

Ogunleye et al. (2024) examined agent banking networks and their contribution to inclusion targets under Nigeria's National Financial Inclusion Strategy. Using Central Bank transaction data, they observed that agent density correlated strongly with increased account penetration in underserved areas. This similarity extends to the evaluation of banking infrastructure effects; however, their reliance solely on agent data contrasts with our multi-channel analysis.

Adetunji and Hassan (2023) studied fintech start-ups' impact on micro-entrepreneur financing in Lagos and Abuja. They found that digital lending apps improved micro-business capital access, indirectly fostering inclusion. The similarity with our research is in exploring fintech's inclusion role, but our study focuses on transactional channels rather than credit provision alone.

Nwosu and Oladimeji (2024) evaluated biometric authentication in mobile banking for rural populations in Southwest Nigeria. Findings showed increased trust and reduced fraud incidences, boosting account usage. The study shares our interest in trust-enhancing digital tools but differs as it centres on security rather than access expansion per se.

Kalu and Ahmed (2023) explored the link between mobile network coverage expansion and financial service uptake in Northern Nigeria. Using panel data from telecom and bank reports, they concluded that improved connectivity boosted both USSD and mobile app transactions. This is similar in addressing digital infrastructure as an inclusion enabler, though our study embeds this variable within a broader regression model covering multiple service types.

Eromosele et al. (2025) investigated QR code payment adoption among small retailers in Nigeria's South-West. Their survey of 800 merchants showed higher transaction volumes and reduced cash handling costs. This relates to our work's focus on digital transaction

channels, yet differs in examining merchant-side adoption, while our analysis is user-centric.

Balogun and Peters (2024) studied the synergy between POS services and mobile banking in enhancing inclusion in peri-urban communities. They found that the combination of both channels had a multiplicative effect on account usage. Our study aligns in exploring multiple channel interactions but extends beyond peri-urban to include rural and dense urban markets.

Adegbite et al. (2023) evaluated the role of digital literacy in promoting DFS adoption in Ogun State. Results showed that literacy significantly predicted usage of both web banking and USSD platforms. The similarity with our work lies in acknowledging user capability as a determinant, but our study operationalises this within a national framework rather than a state-specific one.

Fashola and Bello (2025) examined women's financial inclusion through mobile savings apps in Northern Nigeria. Findings revealed significant improvements in savings behaviour among female micro-traders. This complements our work's emphasis on inclusion but differs in adopting a gender-specific lens, whereas ours uses a gender-neutral national dataset.

Olumide and Akpan (2023) analysed the relationship between e-government payment platforms and financial inclusion in Nigeria. Their time-series analysis indicated that integrating government transfers into DFS platforms increased account registrations. This overlaps with our focus on transactional channels but excludes commercial banking services, which our study covers.

Jimoh et al. (2024) assessed rural farmers' adoption of mobile money for produce sales. The study found that DFS increased transaction speed and market reach, indirectly enhancing financial inclusion. Our study shares this interest in rural access but differs in scope, as we analyse the entire banking ecosystem.

Obi and Etim (2025) explored contactless card payments and their role in broadening access to financial services. Their findings indicate a steady migration from cash to card-based transactions among banked populations. This relates to our study in evaluating digital payment modes but differs in focusing on an already banked demographic.

Akinyemi and Musa (2023) examined mobile banking's role in remittance inflows in Southwest Nigeria. They observed that DFS platforms reduced remittance transaction costs and improved speed, thereby encouraging account ownership. This is relevant to our focus on transactional efficiency, though our study evaluates domestic transactions as well.

Shittu et al. (2025) analysed AI-driven customer service chatbots in Nigerian banks and their effect on DFS adoption. They found that improved query resolution increased

satisfaction and repeat usage. While this relates to digital adoption patterns, our study does not focus on AI tools, making this a peripheral but relevant comparison.

Ojo and Bakare (2023) studied the adoption of hybrid DFS platforms combining mobile and web interfaces. Their results indicated that users with access to both had higher financial activity levels than single-channel users. This directly parallels our investigation into multiple digital service channels, though their geographic focus was Lagos-only, whereas ours is nationwide.

METHODOLOGY

The applicable study design is the descriptive survey conducted in Makurdi and Jos metropolises of Benue State and Plateau State. The population of the study is 2024 of Bank Staff, Bank Customers, Financial Analysts, Academics, Traders and Policy Makers. The whole population was used and the selection of the respondents was by the researcher visiting Makurdi and Jos metropolises formed into strata within one month two weeks. The source of data used for this study was primary and the instrument for the data collection was a self-administered questionnaire that comprised of both open-ended and close-ended questions. The nature of the questionnaire used for this study was a five-point Likert-scale which ranges from "strongly agree" to "strongly disagree" (1 = 'Strongly Agree', 2 = 'Agree', 3 = 'Neutral', 4 = 'Disagree' and 5 = 'Strongly Disagree'). The instrument was validated by one bank manager, one financial analyst and one academia of Reader position in a university where each was given copies questionnaire for vetting. The method of data analysis was by Chi-square statistical tool employed to test the hypotheses to see deviations of the actual observations (observed frequency) from the expected that led to the acceptance or rejection of the null hypotheses. The chi-square formula is

Chi square $\chi^2 = \dfrac{\sum [(fo - fe)^2]}{fe}$

Where:

O = Observed value (frequency);

E = Expected value (frequency) and

$\sum$ = Summation sign.

Degree of freedom = (Rows - 1) (Column -1)

Level of significance = 0.05

Expected frequency (E) is calculated as;

$E = \dfrac{R \times C}{N}$

Where R = Row total

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C = Column total

N = Sample Size

HYPOTHESES

HO_1: There is no significant effect of POS transactions, a form of DFS, as a function of financial inclusion has on the development of the Nigeria economy

HO_2: There is no significant effect of USSD-based transactions, a form of DFS, as a function of financial inclusion has on the development of the Nigeria economy

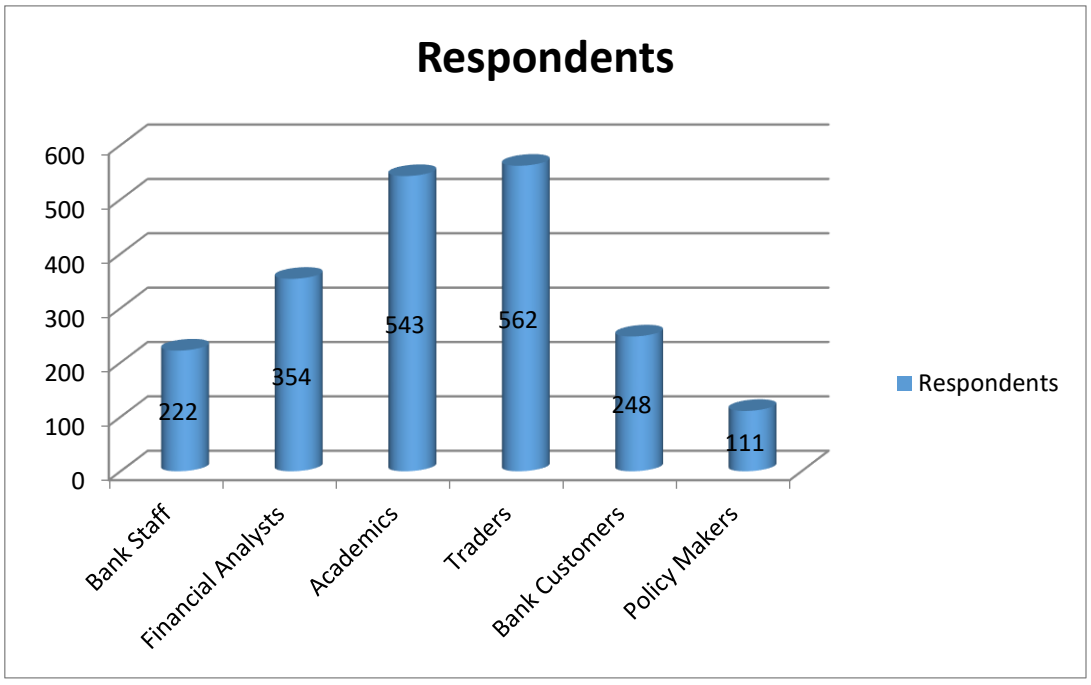
HO_3: There is no significant effect of ATM-based transactions, a form of DFS, as a function of financial inclusion has on the development of the Nigeria economy.

Table 1: Number of Responses from Respondents

Respondents: Bank Financial Academics Traders Bank

Policy	Total	Staff	Analysts	Customers	Makers	
No. of Responses	222	354	543 562	248	111	2024

Source: Researcher's Survey



Source: Researcher's presentation

Table 1 shows the distribution of the responses from the targeted population.
Figure 1, also shows the graphical representation of the responses from the respondents. The Traders responded more than others while the least was the Policy Makers.

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The null hypotheses are:

HO_1: There is no significant effect of POS transactions, a form of DFS, as a function of financial inclusion has on the development of the Nigeria economy

HO_2: There is no significant effect of USSD-based transactions, a form of DFS, as a function of financial inclusion has on the development of the Nigeria economy

HO_3:There is no significant effect of ATM-based transactions, a form of DFS, as a function of financial inclusion has on the development of the Nigeria economy.

So what chi square does is to compare these numbers (the observed frequencies) with those that would be expected by chance (the expected frequencies).

Decision Rule

If the P-value is more than the level of significance 0.05 reject $\mathbf{H_o}$ and accept $\mathbf{H_1}$.

However, if the P-value is less than the level of significance of 0.05 accept $\mathbf{H_o}$ and reject $\mathbf{H_1}$.

The first question in doing the calculation is, how do we get the expected frequencies? If we are testing the observed frequencies (Table 1) against what we would expect by chance, since we have six categories of respondents, we would expect one-fifth of the respondents to fall in each of the categories. One-fifth (20%) of 2024 is 405. So if the selection of respondents is largely a chance pattern, we would expect to find 405 category.

Table 2 shows the observed and expected frequencies for each respondents\stakeholders, computes the difference between them (O–E), squares O–E ($(O–E)^2$), divides the squares by the expected frequencies ($(O–E)^2/E$), and sums those quantities to give us our X^2, which is 471.16

Table 2: Observed and Expected Frequencies for the selection of majors

Respondents	O (observed frequency)	E (expected frequency)	O-E	$(O–E)^2$	$(O–E)^2/E$
Bank Staff	222	405	-183	33489	82.69
Financial Analysts	354	405	-51	2601	6.42
Academics	543	405	138	19044	47.02
Traders	562	405	157	24639	60.74
Bank Customers	248	405	- 157	24649	60.86
Policy Makers	111	405	-294	86436	471.16
TOTAL	**2024**				

Source: Researcher's Calculations

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Re-state Decision Rule

Since the P-value 4.71 is more than the level of significance 0.05, we reject $\mathbf{H_o}$ and accept $\mathbf{H_1}$

Hence we accept $\mathbf{H_1}$.

FINDINGS

There is positive significant effect of POS transactions, a form of DFS, as a function of financial inclusion on the development of the Nigeria economy.

There is positive significant effect of USSD-based transactions, a form of DFS, as a function of financial inclusion on the development of the Nigeria economy

There is positive significant effect of ATM-based transactions, a form of DFS, as a function of financial inclusion on the development of the Nigeria economy

CONCLUSION

Here therefore, for the development of the Nigeria economy based on financial services and financial inclusion, the development would be enhanced when the various financial services work together and availability of various digital channels, robust infrastructure, and supportive policies that would ensure affordability, reliability, and accessibility of digital financial services to the unbanked and under banked. Point-of-Sale (POS) transactions, Unstructured Supplementary Service Data (USSD) and Automated Teller Machines (ATMs) were discussed

RECOMMENDATIONS

POS Infrastructure should be strengthened to give strong correlation with financial inclusion and there is the need to address recurring painful and negative issues of network downtime, transaction failures, and fraud. More so, regulators and service providers should invest in more resilient infrastructure and enforce stricter standards for POS operators.

There should be expansion of USSD accessibility since the services remain the most inclusive for rural and low-income populations. Also banks and mobile network operators should reduce service charges and expand partnerships to ensure wider reach. Policymakers should encourage USSD interoperability across banks to enhance convenience.

There should be a repositioning of ATMs now that the world is in a digital era While ATMs still correlate positively with inclusion, their declining relevance suggests a need to integrate them with digital functions such as cardless withdrawals and QR-enabled services. This will extend their utility beyond cash dispensing.

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