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MODERN PAYMENT PLATFORMS AND THE NIGERIAN FINANCIAL SERVICE ACCESSIBILITY: A RURAL BANKING MODEL

EDOJAIMONI, L.E. (MSc. Candidacy)¹ & OSUJI, C.C. (PhD)²

^{1&2}Department of Banking and Finance,
Faculty of Management Sciences,
Delta State University, Abraka, Nigeria.

*Corresponding Author: EDOJAIMONI, L.E.

Corresponding Author Email: vinaemuobol@gmail.com

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ABSTRACT

The study examined the effect of modern payment platforms on financial service accessibility in Nigeria: a rural banking model. Specifically, this study examined the effects of Automated Teller Machines-ATM operations, Mobile Banking operations-MOB, Internet Banking-INB operations, and Point of Sale-POS operations on the Number of Account Holders-NAH in Nigeria. The study spanned from 2009 to 2021. The study adopted the robust least square estimate. Meanwhile, the study sourced data principally from Central Bank of Nigeria Statistical Bulletins, and World Bank Data Bank from 2009 to 2021. The study disclosed that, ATM and INT had negative/adverse significant effect on numbers of account holders in Nigeria. However, both MOB and POS had positive/direct significant effect on numbers of account holders-NAH in Nigeria. Hence, the study concludes that mobile banking and Point on sale increased the level of financial service accessibility while ATM and INB widened the level of financial exclusion in Nigeria to a large extent. As such, banks should increase their ATM booths or terminals. Lastly, there is need for public enlightenment on the benefit that is accruable from the usage of Mobile transfer transaction.

Keywords: Modern Payment Platforms, Nigerian Financial Service Accessibility, Rural Payment Model.

INTRODUCTION

Prior to the advent of modern payments platforms, individuals have to visit the bank before financial transactions are completed. This payment platform brings about many dissatisfaction in that, individuals have to stay the whole day before they are attended. Even in some circumstances, they have to forego other things just to step into the bank and be told that there is no network. More so, those situated at the rural areas were excluded from enjoying financial services. However, with the advent of modern banking platforms in the 21st Century, individuals do not need to visit the bank before transactions can be consummated. Banking in present time, can now be practiced anywhere using several modern payment tools like cell phones, automated teller machines, point-of-sale structures, smart televisions, computers, tablets, among others (Mala & Vasanthi, 2017). Worthy to note is that, top-notch banking transactions can be completed or initiated from wonderful locations outdoor banking premises which transfer and receipts of funds, balance inquiry a charge of bills, and account opening anywhere in the world without obstruction.

Asare, and Sakoe (2017) and Goodland, Onumah, and Amadi (2019) noted that, Nigeria having experienced large unbanked population, cash transactions, low-income segment, inadequate banking, inadequate transferring of funds, e.tc. are enjoying efficient and functional banking operation/systems as a result of the emergence of modern banking. Nevertheless, challenges and issues have been birthed due to the usage of all these modern payment facilities. One major concern that has called for immediate attention is that a percentage of the Nigerian population are not educated and they reside in the villages and are also lagging behind in the usage of these facilities.

Another issue that has obstructed the ease of operation of the banking system is the lack of internet accessibility in some of the remote areas in the country. The lack of internet in majority of the rural areas has hampered the operating system of the modern payment options and the massive queues in banking halls and the use of tally numbers to cheques and make savings and withdrawals that were common in the Nigeria banking system had to be addressed in line with the modern realities as seen and practiced in the developed counties of Europe and America (Adaora, Okonkwo, & Ananwude, 2018; Osuji & Akujuobi, 2012; Osuji, 2014). In view of this, the study examined the effect of modern payment platforms on financial service accessibility in Nigeria: a rural banking model. Specifically, this study seeks to examine the effect of Automated Teller Machines-ATM operations, Mobile Banking operations-MOB, Internet Banking-INB operations, and Point of Sale-POS operations on the Number of Account Holders-NAH in Nigeria.

LITERATURE REVIEW

Conceptual Linkages and Hypotheses Development

Ogbonna, Okaro, and Igwe (2019) viewed modern payment platforms as the act of providing banking services through banks to customers through different electronic means without necessarily visiting the bank. Similarly, Ogbonna, Okaro, and Igwe (2019) defined modern payment platforms are various options in which financial transactions are consummated electronically. According to Kumari (2021), large numbers of people stay in far-off and

geographically dispersed regions wherein the provision of banking centers is constrained and to attain those unbanked. As such, through modern banking platforms, these access financial services.

Anand and Saxena (2017) noted that, modern payment platforms increase the financial service accessibility such that even the poorest poor access banking services without obstruction. Dhar (2019) added that, through modern banking platforms, banking services are extended to all banking clients especially those situated in villages. According to Ene, Abba, and Fatokun (2019), the significance of mobile technology is increasing financial offerings to the bad at low-priced fees pushed through the truth that its major price pertains to preliminary improvement and different constant charges with very low marginal charges in keeping with the transaction or consistent with a new customer. The affordability of cell cash offerings (as compared to handy and financial offerings) way cellular cash is a beneficial road toward multiplied financial inclusion, making it critical in international locations in which financial accessibility is excessive or wherein humans are informally served.

Furthermore, when poor families have access to banking services, they can earn more, build assets and cushion themselves against external shocks. The major advantages of financial service accessibility include: increase in household Income, acquisition of Assets, reduce Vulnerability, and create Job opportunity. However, the challenges faced by financial service accessibility include lack of Required Documentation, low Levels of Financial Literacy, high Service Fees, and Opposition from Banks. Hence, the paper hypothesizes that:

H₀: Modern payment platforms (ATM, MOB, POS, & INT) does not influence the Number of Account Holders in Nigeria significantly

Theoretical Review

The Technology Acceptance Theory was used to underpin the study. The theory argued that, both the acceptance and the use of technologies brings about immediate and long-term benefits both to organisations and individuals. Various advantages of the use of these technologies include: increased financial service accessibility, higher performance, convenience and time efficiency (Curley, 2017; Sharda, Barr & McDonnell, 2018; Davis, 2019).

According to TAM, technology acceptance cut across three-stages and these stages include external factors (system design features) trigger cognitive responses (perceived ease of use and usefulness). This in turn leads to affective response (attitudes towards modern payment platforms/technology). The implication of this is that, the acceptance of modern banking/payments platforms by customers is important to recording the fulfillment of financial service accessibility.

Empirical Review

Osuji, Erhijakpor, and Mgbeze (2022) examined the effect of E-Banking Platforms on the Financial Inclusiveness Index-financial service accessibility index in Nigeria and evidenced that, ATM, POS, MOB, influenced is financial inclusion significantly but ATM and Web pay channels did not.

Nwude, Donatus, and Udeh (2020) studied the e-banking, banks' performance and financial inclusion in Nigeria from 2007-2019. The study adopted the multiple regression analysis models. The study disclosed that modern payment platforms have made a positive significant contribution to financial service accessibility in Nigeria.

Conversely, Ene, Abba, and Fatokun (2020) disclosed that automated teller machines do not significantly impact financial inclusion while point-of-sale devices significantly impact financial inclusion in Nigeria. However, Gbalam, Peter Eze (2020) studied the determinants/drivers of financial Inclusion in Nigeria and evidenced that, the ratio of rural deposits to loan, lending rates and domestic credit to private sector increased financial inclusion significantly. Meanwhile, Muoghalu, Okonkwo, and Ananwude (2018) disclosed that POS frauds has a significant adverse effect on interest incomes, while ATM, MOB and the INB frauds had no impact on return on assets-ROA, return on equity-ROE, and non-interest income of banks.

Kumari (2021) evidenced that, modern payment options has ceased to function as a tool for financial inclusion in India between 2010 and 2015. Meanwhile, Enueshike Peter and Okpebru, and Oden (2019) rural bank deposit (RBD) affect the Nigerian economy significantly.

Marathe (2017) carried out research work on the problems of online banking; issues and possible solutions. Vector Error Correction Model was adopted. The study disclosed that INB had to be properly regulated to reduce insecurity and safeguard depositors' funds.

Obiaks (2017) investigated the problems and prospects of modern Banking in Nigeria. Chi-square was adopted. The result of the study disclosed that modern payment options will not lose its place in existence.

RESEARCH METHODOLOGY

The paper adopted the ex-post facto research design because the present study is highly objective as much as possible and the variables under study existed in retrospect. As such, cannot be manipulated. In terms of population and sample size, the study is confined to the Nigerian economy. Meanwhile, the study sourced data principally from Central Bank of Nigeria Statistical Bulletins, and World Bank Data Bank from 2009 to 2021.

The software that was used to run the regression is Econometric views (E Views 9.0 version). The choice of this statistical package is due to it is user friendly and easy to compute. Meanwhile, the Robust Least Square (RLS) served as the estimation technique. This estimation technique unlike the Ordinary Least Square Estimate-OLS accounts for variable perturbation. In tandem with prior studies, our model is specified below:

$$NAH = \beta_0 + \beta_1 ATM + \beta_2 MOB + \beta_3 INTB + \beta_4 POS + U_{it} \dots \dots \dots (1)$$

Where:

- NAH = Number of Account Holders
- ATM = Automated Teller Machine measured expressed in Volume
- MOB = Mobile Banking expressed in Volume
- INTB = Internet Banking expressed in Volume
- POS = Point of Sales expressed in Volume
- ϵ = Error term of the model
- β_0 = Constant value or intercept
- $\beta_1 - \beta_5$ = Regression model coefficients.

Aprioiri Expectation

Following extant empirical studies and the various theories used to underpin this study, we expect a positive relationship between the dependent and independent variable. It is mathematically expressed as:

ATM, MOB, INTB, POS>0(2)

RESULTS AND DISCUSSIONS

This section covered the results and discussions. Meanwhile, the section began with data analysis regression results alongside some robustness check. This is with a view to lead to tenable conclusions and policy recommendations in the next section.

Data Analysis

Data for the study were analyzed using trend analysis, descriptive statistics, correlation analysis, and robustness (diagnostic) test.

Trend Analysis

This involves graphical representation of the behaviour (movements) of the variables over time. The result is presented in figure 1 below:

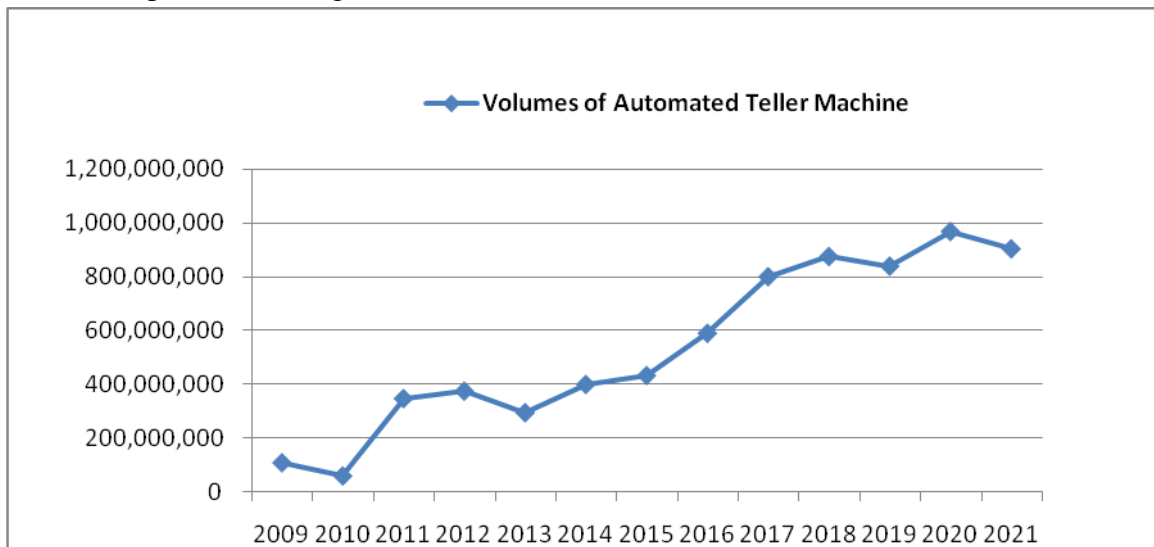


Figure 1: Trend Analysis of volumes of Automated Teller Machine from 2009 to 2021
Source: Researcher’s Compilation, 2022

Figure 1 evidenced clearly that the volumes of automated teller machine for all banks in Nigeria have not been relatively stable over the years. However, it was at its peak in 2020 with ATM value of ₦968,433,479.

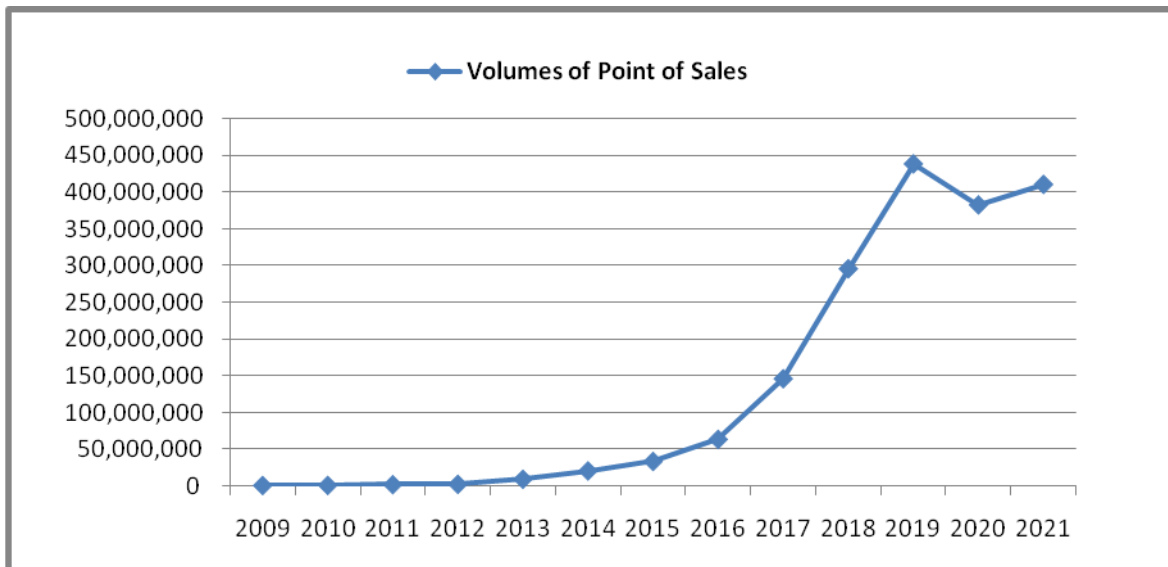


Figure 2: Trend Analysis of POS of Nigerian Banks from 2009 to 2021
Source: Researcher’s Compilation, 2022

Figure 2 above evidenced clearly that the POS for all banks in Nigeria have not been relatively stable over the years. However, point of sale for Nigerian banks was at its peak in 2019 with POS value of 438,614,182

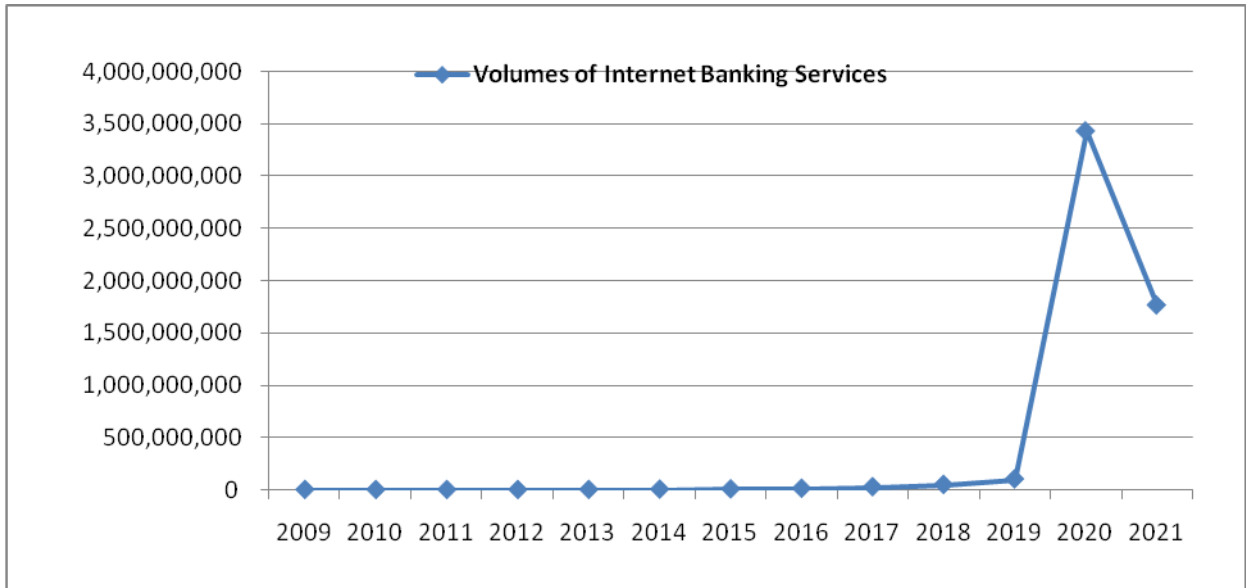


Figure 3: Trend Analysis of INB of Nigerian Banks from 2009 to2021
Source: Researcher’s Compilation, 2022

Figure 3 above evidenced clearly that the INB for all banks in Nigeria have not been relatively stable over the years. However, internet banking for Nigerian banks was at its peak in 2019 with INB value of 3,432,692,730

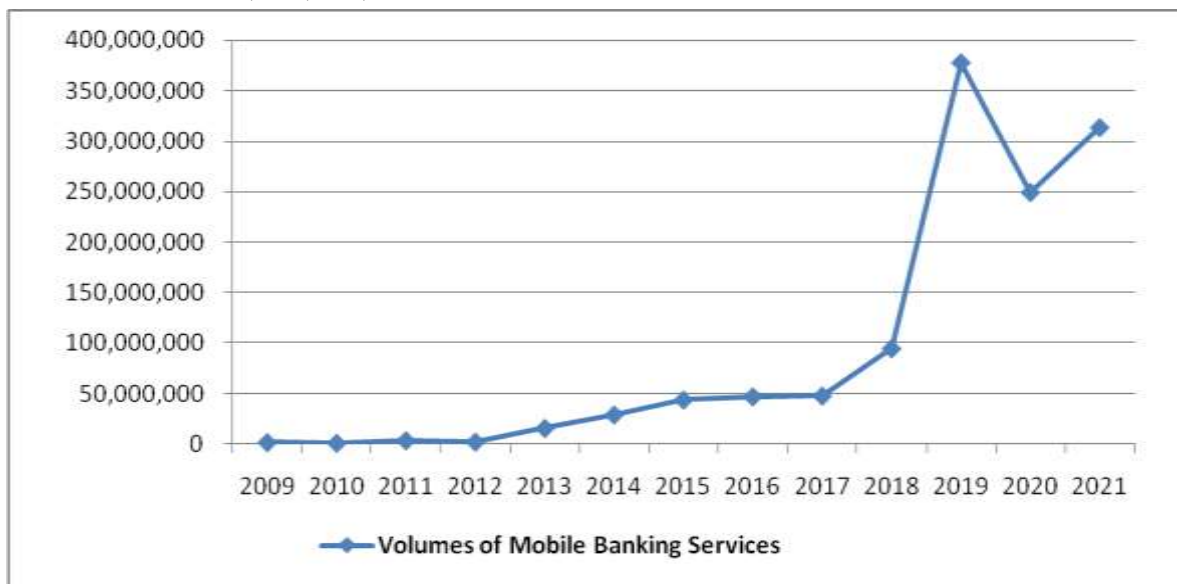


Figure 4: Trend Analysis of MOB of Nigerian Banks from 2009 to2021
Source: Researcher’s Compilation, 2022

Figure 4.4 above evidenced clearly that the MOB for all banks in Nigeria have not been relatively stable over the years. However, mobile banking for Nigerian banks was at its peak in 2019 with MOB value of 377,265,208

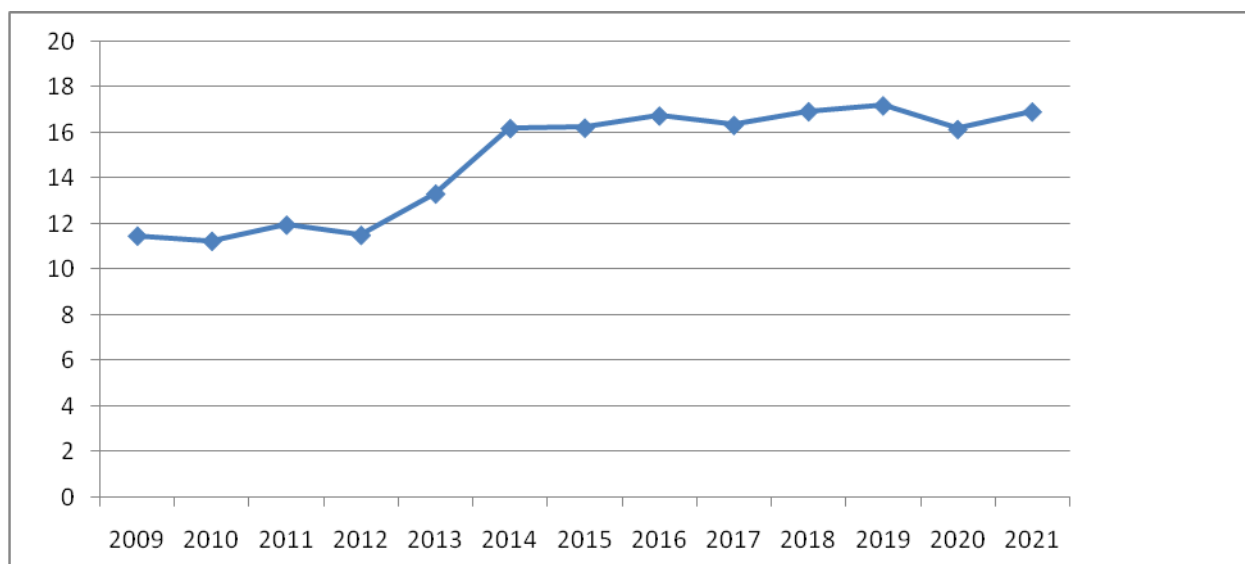


Figure 5: Trend Analysis of number of account holders of Nigerian Banks from 2009 to 2021

Source: Researcher's Compilation, 2022

Figure 5 above evidenced clearly that the NAH for all banks in Nigeria have not been relatively stable over the years. However, number of account holders for Nigerian banks was at its peak in 2019 with NAH value of 17.19. This therefore cast doubt on stability of the study variables. However, our study variables would be tested further to know whether this assertion is true to life or not.

Descriptive Statistics

Table 1

Descriptive Statistics

	NAH	ATM	MOB	INT	POS
Mean	14.7762	538,463,348	139,126,892	417,166,322	94,372,175
Median	16.1900	433,587,623	33,720,933	7,981,361	43,933,362
Maximum	17.1900	968,433,479	438,614,182	3,432,692,730	377,265,208
Minimum	11.2300	60,133,610	918,256	1,601,086	1,156,533
Std. Dev.	2.3508	298,683,167	168,864,353	986,900,088	125,015,828
Observations	13	13	13	13	13

Source: Econometric Views Version 9.0 (2022)

Table 1 reported 13 observations. On the overall, NAH had a mean value of 14.7762. Meanwhile, NAH had a standard deviation value of 2.3508. This implies that NAH had a low volatility and cluster around the mean value. Again, the value of ATM, MOB, INT and POS reported a mean value of 538,463,348, 139,126,892, 417,166,322, and 94,372,175. Meanwhile, they reported standard deviation values of 538,463,348, 139,126,892, 417,166,322, and 94,372,175. This suggests that INT, MOB are highly volatile while ATM and POS are not volatile. This is because the standard deviation values of ATM, and POS is lower than their mean values.

Lastly, to satisfy the classification assumption OLS which states that for the model to possess Best Linear Unbiased Estimate (BLUE), the residual of the model must be normally distributed, we then subjected the model to residual diagnostic test (normality test). The normality test result is presented below:

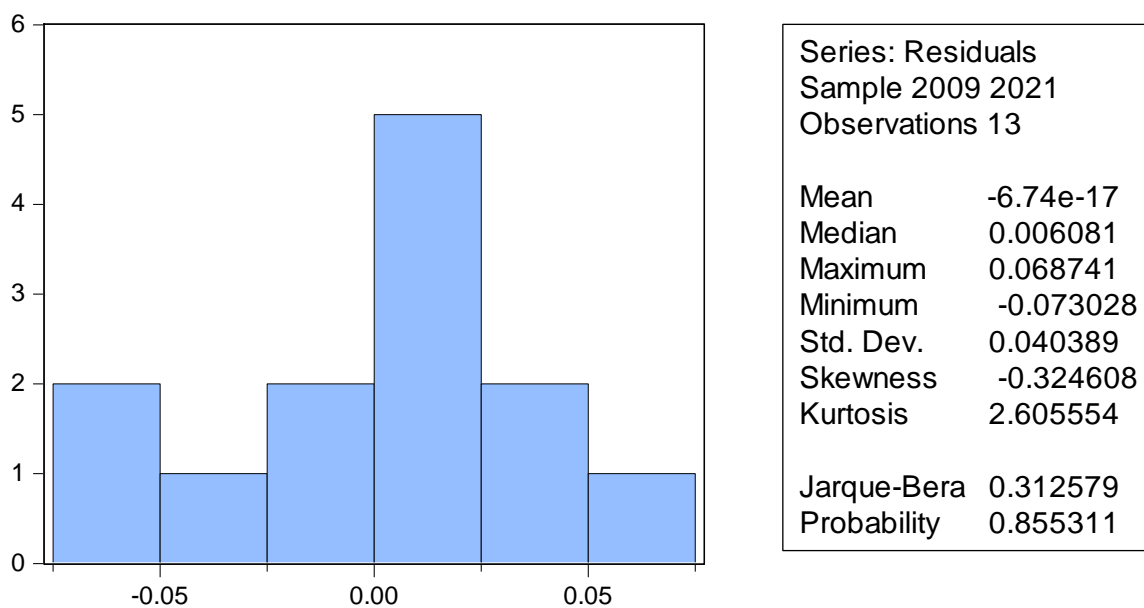


Figure 6. Normality Test

Source: Econometric Views Version 9.0 (2022)

Figure 6 below clearly revealed that the residual of the error terms are normally distributed. This is because the p-value of the Jacque-Bera test estimated at 0.858151 is greater than 5% significant level. Hence, we can conclude that the model is normally distributed and thus serve as a basis for making future forecast.

Correlation Analysis

The correlation analysis result is presented in table 3 below:

Table 2

Summary of Correlation Analysis

	NAH	ATM	MOB	INT	POS
NAH	1.000000				
ATM	0.826524	1.000000			
MOB	0.614537	0.156626	1.000000		
INT	0.295958	0.167364	0.048188	1.000000	
POS	0.677796	0.481402	0.343833	0.624003	1.000000

Source: Researcher’s Compilation (2022)

From table 2, all the study variables exerted positive influence on inclusive financing. In terms of magnitude/degree of relationship, the value of ATM exerted high influence on financial service accessibility. Meanwhile, Mobile Banking, and Point of Sales exerted moderate influence on financial inclusion. This is because their correlation/relationship coefficients estimated at 0.614537 and 0.677796 and respectively falls within 31%-69% rule of thumb rule for moderate correlation (Gujarati, 2003). Lastly, internet banking influence on financial service accessibility is weak. This is because its correlation coefficients estimated at 0.295958 falls within 0%-30% rule of thumb rule for moderate correlation (Gujarati, 2003).

Furthermore, none of the independent variables exhibited high correlation. This is because their correlation coefficient values were up to 70% rule of thumb rule for likelihood of Multicollinearity problem (Gujarati, 2003).

Regression Result

To ensure that the model is fit for prediction, the model was further subjected to Ramsey RESET Test and Heteroskedasticity Test before presenting and discussing the regression result. These diagnostic tests are presented below:

Table 3

Robustness Check

Robustness Check	F-Statistics	Df	Prof
Ramsey RESET Test	1.326401	(1, 7)	0.2873
Heteroskedasticity Test	3.269029	Prob. F(5,7)	0.0771

Source: Researcher's Compilation (2022)

The Ramsey Test with p-value of 0.2873 while the Heteroskedasticity test has a p-value of 0.0771 suggesting that no value is missing, the model is well-specified, and is Homoskedastic-i.e. the residuals spreads equally. Hence, is fit for prediction. Sequel to this, the Robust Least Square -RLS estimate is presented below:

Table 4

Robust Least Square

Dependent Variable: NAH				
Method: Robust Least Squares				
Date: 06/09/22 Time: 21:34				
Sample: 2009 2021				
Included observations: 13				
Method: M-estimation				
Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	3.265591	3.972380	0.822074	0.4110
LOG(ATM)	-0.671612	0.267023	-2.515189	0.0119
LOG(MOB)	1.594599	0.245295	6.500747	0.0000
LOG(INT)	-0.638910	0.078816	-8.106318	0.0000
LOG(POS)	0.503089	0.228934	2.197527	0.0280
Robust Statistics				
R-squared	0.581673	Adjusted R-squared	0.372509	
Rw-squared	0.991792	Adjust Rw-squared	0.991792	
Rn-squared statistic	658.8473	Prob(Rn-squared stat.)	0.000000	

Source: Econometric Views Version 9.0 (2022)

The regression result in table 4 revealed that, the independent variables jointly accounted for at least 58.16% of the total variation in financial service accessibility in Nigeria. Additionally, the entire model (Rn-squared statistic) signaled that, the modern payment platforms influences financial service accessibility in Nigeria.

Specifically, the RLS result revealed that ATM and INT had negative/adverse significant effect on numbers of account holders in Nigeria. This implies higher volumes of ATM and INT reduces NAH by high values of by -2.515189 and -0.638910 respectively. The justification for this is that the increase in fraud perpetrated on ATM has resulted to panic state thereby leading to reduction of customer's willingness to use ATM and INT platforms. This is the position of this study. Hence, this finding is therefore critical to NAH in Nigeria. To further validate theories as well as the result is in tandem with Muoghalu, Okonkwo, and Ananwude (2018) findings but contradicts Kumari (2017) findings.

Lastly, both mobile bank-MOB and POS had positive/direct significant effect on NAH in Nigeria. This is because it reported a positive coefficient value 1.594599 and an estimated p-value (0.0000) is lesser than 5% level. This implies that a unit rise in MOB will decrease

numbers of account holders of Nigeria countries by 1.594599. This implies that MOB has significant effect on NAH in Nigeria. The justification for this is that MOB improves the account holders of Nigeria. This is the position of this study. Hence, this finding is therefore critical to NAH in Nigeria. To further validate theories as well as the result is in tandem with the findings Ene, Abba, and Fatokun (2020); Muoghalu, Okonkwo, and Ananwude (2018); Marathe (2017); Udeh (2020); Ene, Abba, and Fatokun (2020); Marathe (2017) but deviated from the findings of Obiaks (2017); Kumari (2017); Obiaks (2017); Kumari (2017).

Table 5

Test of Hypotheses

Testable Form	P-Value	Decision Rule	Conclusion
$ATM \neq FIN$	0.0119	Reject H_{01} if its P-value is $<5\%$, otherwise accept H_{01} if its p-value is $> 5\%$	Reject H_{01}
$MOB \neq FIN$	0.0000	Reject H_{02} if its P-value is $<5\%$, otherwise accept H_{02} if its p-value is $> 5\%$	Reject H_{02}
$INTB \neq FIN$	0.0000	Reject H_{03} if its P-value is $<5\%$, otherwise accept H_{03} if its p-value is $> 5\%$	Reject H_{03}
$POS \neq FIN$	0.0280	Reject H_{04} if its P-value is $<5\%$, otherwise accept H_{04} if its p-value is $> 5\%$	Reject H_{04}

\neq Null hypothesis

Source: Researcher's Compilation (2022)

CONCLUSION AND RECOMMENDATIONS

Consequent upon the various results discussed in section four, the study concludes that mobile banking-MOB and Point on sales-POS increased financial service accessibility in Nigeria while Automated Teller Machine and Internet Banking widened the level of financial exclusion in Nigeria to a large extent. Hence, the paper recommends:

1. Banks should increase their ATM booths or terminals since it is instrumental to high level of financial inclusion in Nigeria.
2. There is need for public enlightenment on the benefit that is accruable from the usage of Mobile transfer transaction.
3. Nigerian regulatory authorities should provide end-to-end digital onboarding so as to reduce cases of electronic fraud.
4. There is need for bank to first conduct character search before they give out their POS machines to would be agents. This is to ensure that the current positive effect POS has on the level of financial inclusion currently is sustained.

Contribution to Knowledge

This study has made a tremendous contribution to knowledge in various ways as outlined below;

- i. The inclusion of numbers of account holders as a proxy to financial service accessibility has helped to bridge the missing link in extant studies on the effect of modern payment options on financial inclusion in the Nigerian context.
- ii. This study has established a foundation and points to a direction for policy formulation in the Nigerian context.
- iii. The study has increased the extant literature on modern payment options and financial service accessibility in Nigeria especially by bringing the knowledge of combined effects of the regressors on the regressand in the Nigerian context.

Suggestions for Further Studies

- i. Future researches should widen its scope in terms of time scope.
- ii. Future researches may as well examine the challenges affecting the modern payment system in the Nigeria banking industry
- iii. Studies on the alternative banking models should be encouraged.
- iv. Future researches should venture digital banking and the Nigeria economy

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