Electronic Banking and Financial Inclusion in Nigerian Financial System

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Abstract

In this study, the effect of electronic banking on financial inclusion in Nigeria was examined. In particular, the effect of total volume of Automated Teller Machine, total volume of transaction of Nigerian instant payment system, and total volume of transaction by internet banking on financial inclusion in Nigeria was investigated. Between 2012 and 2024, a sample of twelve listed deposit money banks was investigated using descriptive statistics, correlation analysis, and pooled last square regression. The various analyses were used to investigate the connection between financial inclusion in Nigeria and electronics banking. The empirical findings showed the variables had a substantial impact on financial inclusion in Nigeria. We recommend among others; that management of deposit money banks in Nigeria should allocate more resources towards financial innovation and enhancement of the existing infrastructures since they have been found to improve financial inclusion.

Key words: Automated Teller Machine, Deposit Money Banks, Electronic Banking, Financial Inclusion, Nigeria

Introduction

Financial inclusion seeks to ensure that individuals have access to affordable and useful financial products and services that are well aligned to their needs (Jepchumba & Simiyu, 2019). Accessibility and ownership of a formal account with a financial institution is the first broader perspective of financial inclusion. Financial inclusion seeks to ensure that the excluded and underserved population is able to access and use formal financial services and products (Asli, Klapper & Singer, 2017). In industrialized nations like United States of American, Japan and China, there is higher financial literacy which is directly linked with high probability of utilization of fintech services. Most people in these developed countries have greater financial literacy hence high probability of using fintech services particularly electronic banking (Yoshino, Morgan & Long, 2020, Chen & Yuan, 2021). However, in most developing countries in Asia and Africa, most people living in rural areas are financially excluded from formal financial services (Cicchiello, Kazemikhasragh,

Monferrá & Girón, 2021; Abdi, Hussein & Kadir, 2022).

It is important for developing countries to extend financial technologies products like ATM and electronic banking channels to rural areas to address financial exclusion issues (Isukul & Tantua, 2021). In Nigeria, ATM, internet banking and mobile money have accelerated the pace of financial inclusion among people in the country. Financial inclusion is one of the objectives of the Central Bank of Nigeria's cashless policy introduced in the year 2011. The policy is intended to drive the development and modernization of the payment system in Nigeria in one hand, reduce the cost of banking services on the other hand and thirdly to drive financial inclusion by providing more efficient transactions options and greater reach. Thus, the adoption of the cashless policy has led to remarkable increase in the level of technology (electronic banking) acceptance by deposit money banks in Nigeria and it is evidenced by the increase in the number of automated teller machines, point-of-sales facilities, internet banking, mobile banking, among others (Ene, Abba & Fatokun, 2019).

Electronic banking is a form of financial innovation among financial institutions that include such elements as adoption if automated teller machines (ATMs), mobile banking and internet banking to provide services and products to customers. The adoption of electronic banking allows customers to access and utilize financial services and products from financial institutions more easily and conveniently as opposed to transacting through physical banking halls (Kariuki, Kimundi & Makambi, 2018). For quite some time, electronic banking has existed among financial institutions through channels as automated teller machines (ATMs) and mobile phone banking. However, with advancement in technology, the internet has transformed and revolutionized the way financial institutions execute their transaction hence internet banking (Jepchumba & Simiyu, 2019).

The key indicators when it comes to financial inclusion are accessibility, safety and utilization besides fairness. Financial inclusion aims at allowing the unbanked population of the people in the country to access formal financial services (Cihak, Mare & Melecky, 2016). It essence is to lower the transaction costs incurred by people when accessing financial services and products. Given that financial institutions are highly regulated, their transaction costs are relatively lower as compared to what shylocks offer (Kariuki, et al., 2018). Financial inclusion allows people to gain basic financial knowledge and information like financial literacy and the need to save and make investment (Ndegwa & Koori, 2019).

Although the relationship between electronic banking and the financial inclusion has drawn significant attention in several nations, the empirical evidence is conflicting. Mago and Chitokwindo (2014), Asare and Sakoe (2015), Nwude, Igweoji and Udeh (2020) and Abdi, et al., (2022), for example, came to the conclusion that there is a significant relationship between electronic banking and the financial inclusion, whereas Ene, et al., (2019) and Osuji, Erhijakpor and Mgbeze (2022) found that automated teller machines do not significantly impact financial inclusion. Difference in variables used, scope of the studies, the estimation techniques adopted and how the process was followed, variable measurement bias, could be responsible for these mixed findings, as such there is need for more study. The relationship between electronic banking and financial inclusion,

as a result, has not been clarified and is still up for debate among researchers. Furthermore, the majority of the Nigerian studies (Ene, et al., 2019; Nwude et al., 2020, Ezekiel, 2021 and Osuji, et al., 2022) undertaken did not use the most recent data through 2024. The influence of electronic banking on the financial inclusion in Nigeria was thus investigated in this study using the most recent data. By analyzing the impact of electronic banking on the financial inclusion in Nigeria, this study aimed to bridge these gaps.

The rest of the paper is organized as follows; section two is review of literature. Section three describes the methodology employed. Section four discusses the empirical results and analysis while section five concludes the study.

Literature Review

Theoretical Review

Different theories have been used to explain financial inclusion by researchers. Some of these theories are the diffusion of innovation theory, the technology acceptance theory and financial intermediation theory.

Diffusion of innovation Theory

The diffusion of innovation theory was developed by Rodgers (1962) and it provides a discussion of how new innovations get to be adopted by the users as time gets to lapse. The theory further provides a clarification of the actions of the end users during adoption of the new innovations like electronic banking in the financial institution. This theory defends the position that organizations take part in the dissemination of innovation so as to acquire competitive benefit, minimize charges and safeguard their tactical spots. The philosophy as suggested by Rogers expounds on in what manner a novelty is dissolved amongst consumers over a specific period (Liu & Li, 2009). The underpinning demonstrates that the adopters' partakers of any advancement in technology assume a bell-shaped scatter curve which can be categorized into five portions to group consumers by way of innovativeness (Rodgers, 1962). Rogers categorized clients as pacesetters, initial adopters, primary majority, late majority and dawdlers. The relevance of the theory to the study is that it explains that forces that drive deposit money banks in Nigeria to adopt electronic banking channels like ATMs with the aim of enhancing financial inclusion.

Technology Acceptance Theory

According to Davies (1989) it is an information systems theory that models how users come to accept and use a technology and behavioural intention is a factor that leads people to use technology. The behavioural intention is influence by the attitude which is the general impression of the technology. Davies suggested that Perceived usefulness (PU) and Perceived ease-of-use are factors that influence users' decision. Perceived usefulness (PU) is the degree to which a person believes that using a particular system would enhance their job performance" It means whether or not someone perceives that technology to be useful for what they want to do. (Davies, 1989) Perceived ease-of-use (PEOU) is the degree to which a person believes that using a particular system would be free from effort, if the technology is easy to use, then the barriers conquered. It's not easy to use and the interface is complicated, no one has a positive attitude towards it (Davies, 1989).

Financial Intermediation Theory

The theory of financial intermediation was developed by Gurley and Shaw (1960), the financial intermediation theory considers financial institutions as intermediaries whose role is to mobilize deposits and savings from surplus units that are

accumulated and latter loaned out in areas with deficit in form of credit facilities. This way, the financial institutions are able to realize financial inclusion.

Empirical Review

In this segment, the review of past empirical studies will be carried out to provide justification for the need for this study. For instance, Mago and Chitokwindo (2014) examined the impact of electronic banking on financial inclusion in Zimbabwe, with a focus on mobile banking in the Masvingo province. The research adopted a qualitative research methodology and a survey design. They found that electronic banking significantly impacts financial inclusion in Zimbabwe. Their results show that low-income people are willing to adopt mobile banking, thereby enhancing financial inclusion.

Bansal (2014) utilized a qualitative research method to study the role of technology in achieving financial inclusion in rural India. The paper attempted to examine the contributions of information and communication technology towards achieving financial inclusion and reducing financial exclusion in the country and analyzed different application of information and communication technology which banks are adopting. The study found that modern information and communication technology can act as a tool to develop a platform which helps to extend financial services to remote areas. The study specifically identifies mobile banking and automated teller machines as two promising options for achieving financial inclusion.

Asare and Sakoe (2015) examined the effects of electronic banking on financial services in Ghana using qualitative research method. The study found out that the advent of electronic banking in Ghana has enhanced accessibility to a wide range of banking products and also delivery of banking services has been made increasingly faster to cover a wide range of customers or people referred by existing customers. Therefore, the study concluded that electronic banking has fundamentally changed the business of banking in Ghana from a financial intermediary to a financial shopping mall providing a one-stop-shop for various financial services.

Ene, Abba and Fatokun (2019) examine the impact of electronic banking on financial inclusion in Nigeria. The study used the total number of automated teller machines and point-of-sale devices in Nigeria as proxies for electronic banking and the proportion of banked adult population to total bankable adult population in Nigeria as proxy for financial inclusion. The study adopted multiple regression analysis. It was observed that automated teller machines do not significantly impact financial inclusion while point-of-sale devices significantly impact financial inclusion in Nigeria.

Nwude, Igweoji and Udeh (2020) investigate the effect of e-banking on banks performance and financial inclusion in Nigeria for the period 2007-2017. The result of the regression analysis revealed that electronic banking has made positive and significant contribution in promoting financial inclusion in Nigeria. Wanjiku (2020) covered commercial banks in Kenya and sought to link technological banking innovations and financial inclusion. The variables covered in this study were internet, electronic, agency and mobile banking and all were seen to influence financial inclusion. Nazaritehrani and Mashali (2020) did an analysis whose focus was on e-banking channel development and the implication on market shares of developing nations. Among the variables that were covered in this study include point of sales, mobile, internet and ATM banking and these were found to have

positive influence on market share of the banks.

Shihadeh (2021) used the case of Palestine to explore how financial inclusion impacts on performance of banks. The inquiry showed that penetration of banks, adoption of ATMs could enhance the performance of banks. Ezekiel (2021) examined ATMs and their contributions towards financial inclusion using the case of Nigeria. The findings were that penetration of ATMs is a significant predictor of financial inclusion among commercial banks. Sabwa (2021) analyzed mobile banking and the role it plays on financial inclusion borrowing evidence from Kenyan banks. The findings were that mobile banking is a significant predictor of financial inclusion among banks in Kenya.

Gharbi and Kammoun (2022) examine the relationship between digital banking and financial inclusion in Tunisia using four indicators of inclusive development: access, use, quality and efficiency of financial services. By developing a questionnaire survey of Tunisian bank employee, the researchers found a positive relationship between digital banking and financial inclusion in Tunisian.

Abdi, Hussein and Kadir (2022) investigate the effect of automated teller machines and mobile banking on financial inclusion among commercial banks in Somalia. A descriptive survey design was adopted targeting 6 commercial banks in Somalia that had successfully rolled out electronic banking while the respondents covered the Banks staff, like managers and officers from each institution respectively and census was used. Primary data was collected on automated teller machines, mobile banking and customer deposits with the aid of the questionnaire. The analysis was conducted through the Statistical Packages for Social Sciences version 24 utilizing descriptive statistics (means and standard deviations) and inferential statistics (correlation and regression analysis). The study found out that automated teller machines and mobile banking are significant predictors of financial inclusion among commercial banks in Somalia. Thus, electronic banking is a significant enabler of financial inclusion of commercial banks.

Osuji, Erhijakpor and Mgbeze (2022) investigate the connection between Nigerian financial inclusion and electronic banking. The amount of transactions made in Nigeria on ATMs, point-of-sale systems, web-enabled applications, and mobile devices served as proxies for electronic banking in the study, and the ratio of the adult population with bank accounts to the total adult population in Nigeria served as a proxy for financial inclusion. The study used multiple regression analysis with the E-Views 9 program, adopting correlational and ex-post facto research approaches. It was discovered that while the volume of transactions made through point-of-sale and mobile devices is strongly correlated with financial inclusion, those made through automated teller machines and web-based channels do not affect financial inclusion.

Methodology

The longitudinal research design, which is widely relevant in the management and social sciences, was chosen for this study. The researcher does not have the option to change or control the independent variables when using a longitudinal research design since reactions to a factor and its impact on specific individuals are being researched. Due to the independent variables' inherent immiscibility or the fact that their manifestations have already taken place, it is impossible to modify them. All deposit money banks that were listed on the

floor of the Nigerian Exchange Limited as of December 31, 2024, make up the study's population. As of the end of 2024, there were 13 deposit money banks listed on the Nigerian Exchange Limited. The sample filtering method was also applied to the selection of banks, with the requirement that the banks must have continuous data from 2012 to 2024 and be listed as of December 31st, 2024 as the sample size selection criterion. The sample size for this study is comprised of twelve (12) deposit money banks that matched the inclusion criteria. The secondary data was gathered from published financial reports of the deposit money banks in the study. This study is limited to Nigeria amongst other developing countries in Africa, because of its population size.

Model Specification

The specified model examines the effect of electronic banking on the financial inclusion in Nigeria. This study adapts the model of Ene et al., (2019) with some slight modification in terms of the variables utilized to proxy electronic banking and financial inclusion in this particular research. Ene et al., (2019) model is specified as:

$$FIN_t = \beta_0 + \beta_1 ATM_t + \beta_2 POS_t + \beta_3 MPP_t + \varepsilon_t \quad \ldots\ldots (1)$$

where:
FIN = financially included adult population in the country for period t.
ATM = Number of automated teller machines of banks in the country for period t.
POS = Number of point-of-sales machines of banks in the country for period t.
MPP = Mobile phone penetration in the country for period t. (Is a control variable, reason been that mobile phone penetration affects financial inclusion)
β_0 = Intercept
β_1, β_2 are coefficient of the independent variables
ε = Residual or error term for period
t = period

The above model was modified by measuring electronic banking by total volume of ATM transaction, total volume of transaction of NIP payment and total volume of transaction by internet banking while financial inclusion is measure by ratio of total number of deposits per 100,000 individuals.

The model for this study can be specified in functional form as:

$$FINCL = f(VATM, VNIP, VINT, MPP) \quad \ldots\ldots (2)$$

Transforming equation (2) into its panel data form, the model takes the following specification:

$$FINCL_{it} = \beta_0 + \beta_1 VATM_{it} + \beta_2 VNIP_{it} + \beta_3 RVINT_{it} + \varepsilon_{it} \quad \ldots\ldots (3)$$

where,
$FINCL_{it}$ = ratio of total number of deposits per 100,000 individuals *in Nigeria* for period *t*
$VATM_{it}$ = Total volume of transaction by ATM of bank i for period t.
$VNIP_{it}$ = Total volume of transaction of NIP payment of bank i for period t.
$VINT_{it}$ = Total volume of transaction by internet banking of bank i for period t.

β_0, β_1, β_2, β_3 are Parameters to be estimated
ε = Error term
i represents bank i, while t represents time between 2012 – 2024.

Measurement of Variables

Table 1 lists the definitions of the model's variables as well as the previous researcher that utilized the data.

Table 1: Measurement of the variables

S/N	Variable	Variable Type	Measurement	Sources
1	Financial inclusion (FINCL)	Dependent Variable	Measured as the ratio of total number of deposits per 100,000 individuals	Abdi et al., (2022)
2	Volume of transactions by ATM (VLATM)	Independent Variable	Measured as total volume of ATM transactions in Nigeria	Ene et al., (2019)
3	Volume of transactions by NlP (VLNIP)	Independent Variable	Measured as total volume of NIP payment transactions	Wanjiku (2020)
4	Volume of internet banking (VINT)	Independent variable	Measured as total volume of internet banking transactions	Wanjiku (2020)

Source: Author's Compilation, (2025).

The à priori expectation is, $\beta_1 > 0$, $\beta_2 > 0$, $\beta_3 > 0$.
According to theory, financial inclusion should be positively impacted by the total volume of ATM, total volume of transaction of NIP payment and total volume of transaction by internet banking

Results and Discussions

The annual data stream collected from audited financial reports of the listed deposit money banks in the study from 2012 to 2021 are presented and analyzed in this section. Table 2 shows the result of the descriptive statistics.

Table 2: Descriptive Statistics

	FINCL	VATM	VNIP	VINT
Mean	930.5868	8.732564	8.865128	7.095043
Median	923.2300	8.770000	8.190000	7.150000
Maximum	1431.900	8.940000	89.18000	8.130000
Minimum	644.4400	8.470000	6.430000	3.360000
Std. Dev.	277.0875	0.177449	7.605648	0.755963
Skewness	0.526598	-0.053747	10.20889	-0.926911
Kurtosis	1.907797	1.355557	108.1481	6.357997
Jarque-Bera	11.22287	13.23927	55930.96	71.72492
Probability	0.003656	0.001334	0.000000	0.000000
Sum	108878.7	1021.710	1037.220	830.1200
Sum Sq. Dev.	8906190.	3.652631	6710.122	66.29172
Observations	117	117	117	117

Source: Researchers computation (2025) using E-views 9.0 Econometric Software.

Note:
FINCL – Financial inclusion (Measured in millions and in percentage)
VATM – Volume of automated teller machines (Measured in millions and percentage)
VNIP – Volume of Nigeria instant payment system (Measured in millions and in percentage)
VINT – Volume of internet transfers (Measured in millions and in percentage)

According to the descriptive statistics shown in Table 2, the average deposit accounts per 100,000 persons is 930, which is very low and suggests the low level of use of banking sector services in Nigeria. Other variables in the Table indicate that average volume of ATM transaction is 8.73, which suggests a relatively low level of ATM use across the deposit money banks in Nigeria, using the millennium development goal (MDG) standard of per 100,000 persons, for measuring financial inclusion. On the other hand, volume of NIP payment transactions for the period was 8.86 percent on average which is not too high. This indicates low levels of utilization of NIP payment transaction across the banks. The internet banking variable indicates an average of 7.09, which is less than the median value of 7.15 used for the measurement. This suggests that the volume of internet banking did not perform well in terms of volume of transaction over the period. FINCL and VNIP were positively skewed while VATM and VINT are negatively skewed. The Jarque-Bera coefficient for all the variables is significant at the 1 percent level, indicating high level of heterogeneity among the dataset. Thus, the application of panel data estimation technique is appropriate in the study.

Correlation Analysis

It is critical to investigate the degree and direction of link between the variables in the study in advance. These investigations are carried out using correlation analysis. Table 3 shows the results of the correlation tests.

Table 3: Correlation Matrix

Correlation Probability	FINCL	VATM	VNIP	VINT
FINCL	1.000000			

VATM	0.323397	1.000000		
	0.0000	-----		
VNIP	0.270292	0.217017	1.000000	
	0.0032	0.0188	-----	
VINT	0.397376	0.374998	0.228182	1.000000
	0.0000	0.0000	0.0133	-----

Source: Researchers computation (2025) using E-views 9.0 Econometric Software.

NOTE: The variables below are measured in percentages.
FINCL – Financial inclusion
VATM – Volume of automated teller machines
VNIP – Volume of Nigeria instant payment system
VINT – Volume of internet transfers
The correlation result in table 3 show that VATM, VNIP and VINT have strong significant positive relationship with FINCL. This implies that increase in these variables significantly improved FINCL during the studied period as indicated by their corresponding positive coefficients. The correlation among the independent

variables also follow the same pattern that is significant positive relationship. Meaning that, an increase in these variables significantly and positively stimulates each other as shown by their corresponding positive values. Furthermore, table 3 also revealed the absence of multi co-linearity problem among explanatory variables since no correlation coefficient between explanatory variables is > 0.80 as suggested by Gujarati (2008).

Analysis of the Panel Least Square Estimates

Due to endogeneity problems, the Panel least Square estimates are not particularly suitable for policy recommendations. The panel data analysis technique is used to estimate the associations in order to get around this problem. The Hausman test for random effects is the accepted test to choose which panel analysis approach to use. Table 4 summarizes the findings of the tests conducted on the FINCL equation. The result for the FINCL equation shows that the 5.95 Chi-square estimation values failed the test, proving that the random-effect model is suitable for estimating the equations among the cross-sections in terms of FINCL behavior. Therefore, the FINCL equation is estimated using the random-effect method.

Table 4: Summary of Hausman Test for Cross-Section Random Effects

Test Summary	Chi-sq. statistic	Chi-sq. d.f	Prob.
Cross-section random	5.95	3	0.11

Source: Researchers computation (2025) using E-views 9.0 Econometric Software.

Random Effects Model

Based on the findings in Table 4, the statistic offers scant support for the null hypothesis that the random effect model leads in misspecification. Given that we are unable to disprove the null hypothesis that unobserved firm-specific heterogeneity is uncorrelated with regressors, we would be focusing our study on the random effect model's estimations. This suggests that there is a random effect in the behaviour of FINCL among the cross-sectional deposit money banks. The Random-effect technique is therefore the most effective course of action. We present the random-effects estimates in this investigation and use the findings to derive conclusions. Table 5 presents the outcome of the random effects model.

Note: The chi-square for the model is also called the discrepancy function, likelihood ratio chi-square, or chi-square goodness of fit. In AMOS, the ch-square value is called CMIN.
If the chi-square is not significant, the model is regarded as acceptable. That is, the observed covariance matrix is similar to the predicted covariance matrix-that is, the matrix predicted by the model.
If the chi-square is significant, the model is regarded, at least sometimes, as unacceptable. However, many researchers

disregard this index if either the sample size exceeds 200 or so and other indices indicate the model is acceptable. In particular, this approach arises because the ch-square index presents several problem:

- Complex models, with many parameters, will tend to generate an acceptable fit
- If the sample size is large, the model will usually be rejected, sometimes unfairly
- When the assumption of multivariate normality is violated, the chi-square fit index is inaccurate. The Satorra-Bentler scaled ch-square, which is available in EQS, in EQS, is often preferred, because this index penalizes the chi-square for kurtosis.

The relative chi-squre is also called the normed chi-square. The value equals the chi-square index divided by the degrees of freedom. This index might be less sensitive to sample size. The criterion for acceptance varies across researchers, ranging from less than 2 to less than 5.

Table 5: Random-Effects Results for FINCL

Dependent Variable = ROA			
Variables	Coeff.	t-stat	Prob.
C	-8036.522	-10.65615	0.0000
VATM	913.9402	8.875552	0.0000
VNIP	2.127897	1.781231	0.0776
VINT	136.3209	5.625111	0.0000
R^2	0.889996		
$Adj\ R^2$	0.887076		
F-stat	304.7458		
Prob.	0.000000		
D.W.stat.	1.525267		

Source: Researchers computation (2025) using E-views 9.0 Econometric Software.

FINCL – Financial inclusion
VATM – Volume of automated teller machines
VNIP – Volume of Nigeria instant payment system
VINT – Volume of internet transfers

We present the random-effects estimates in this investigation and use the findings to derive conclusions. Table 5 presents the outcome of the random effects model. There exists a significant linear association between financial inclusion and the independent variables because the F-value of 304.74 is significant at the 1% level. This validates the premise that there is a significant linear relationship between the explanatory variables when they are combined and financial inclusion, the dependent variable. The estimated model might not contain autocorrelation, according to the D.W. statistic value of 1.5 which can be approximated to 2. D.W. statistics is used to test the co-relation between explainary varbles and the dependent variable. It is within the range of 1-2.

By examining the individual coefficients of the variables in terms of magnitude, signs, and significance, one may discover the

specific contribution of each explanatory variable to the behaviour of financial inclusion (FINCL). In line to what was anticipated a priori, Table 5 findings suggest that VATM, VNIP and VINT have a positive relationship with financial inclusion (FINCL). Additionally, the results in Table 5 show that the coefficients of VATM and VINT have significant positive effects on FINCL, This has the inference that VATM and VNIP are the two key electronic banking factors that affect financial inclusion (FINCL) in Nigeria.

Discussion of Findings

The results obtained in the empirical analysis are far reaching and give impressive directions. First, the correlation test is the relatively low between the dependent and independent variables and also among the explanatory variables. This indicates that the explanatory variables are not mutually exclusive in explaining financial inclusion and thus do not substitute for each other.

In the same vein, the empirical results show that total volume of ATM transaction and total volume of internet transactions are the two key electronic banking factors that exert significant positive influence on financial inclusion in Nigeria, which conforms to that of Rodgers (1962) diffusion of innovation theory in the literature, whom report that new innovations get to be adopted by the users and ease of use as time gets to lapse. The implication of this finding is that increase in that total volume of ATM transaction and total volume of internet banking transactions will improve financial inclusion in Nigeria. Thus, ATM and electronic banking is a significant enabler of financial inclusion in Nigeria. However, total volume of NIP payment transactions though exerts a positive relationship on financial inclusion and the impact is significant. This outcome is similar to previous findings by Mago and Chitokwindo (2014), Ene et al., (2019), Wanjiku (2020), Ezekiel (2021), Gharbi and Kammoun (2022) and Abdi, et al., (2022) who also found varied impacts of volume of ATM transaction, volume of internet banking transactions on financial inclusion.

Conclusion And Recommendation

Achieving financial inclusion has been the target of governments around the world, especially underdeveloped and developing economies. Thus, financial inclusion is seen by researchers as one of the key drivers of economic growth and development which informed this research effort. Towards contribution to existing knowledge, this paper sets out to empirically investigate the impact of electronic banking on financial inclusion in Nigeria over the period 2012 - 2024. Using correlation analysis and panel OLS regression technique, the empirical analysis reveals that total volume of ATM transaction and total volume of internet banking transactions of listed deposit money banks has a significant and positive impact on financial inclusion in Nigeria. However, total volume of NIP payment transaction has no significant impact on financial inclusion. The study therefore concludes that electronic banking is a key driver of financial inclusion in Nigeria within the period under study.

Based on the empirical findings of this study, the following policy recommendations are suggested for policy action:

i. Management of deposit money banks in Nigeria should allocate more resources towards financial innovation and enhancement of the existing ATM and electronic banking channels and infrastructures since they have been found to improve financial inclusion.

ii. Deposit money bank should ensure that automated teller machines provide convenience for customers by installing more of them since they have been found to be a major driver of financial inclusion in Nigeria. Also, deliberate policy that will enhance the performance of automated teller machines of banks should be made by the apex regulator of the Nigerian banking system. This policy should among others, ensure that automated teller machines installed by banks meet international best standards.

iii. Central Bank of Nigeria should intensify its campaign for the acceptance of electronic banking by the bankable population since it has been identified as one of the key drivers of financial inclusion in Nigeria.

The study's policy implications may be limited to Nigeria due to its conclusions' reliance on that country's specific environment. Therefore, future studies in this field, particularly those involving African nations, should use a panel data technique or conduct cross-country investigations and consider applying system GMM. Insights on the impact of electronic banking across African nations would be useful for policymakers.

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