

# Financial Innovation and Performance of Deposit Money Banks in Nigeria

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## **Abstract**

*The research investigated the impact of financial innovation on the performance of Deposit Money Banks in Nigeria. A time series data covering the periods, 2009 – 2021 was used. The assets of the Deposit Money Banks was used as the dependent variables while the Point of sales, Automated Teller Machine, Internet Banking and Mobile Banking served as the independent variables. The researcher used the ARDL model in the analysis. Further, post-test analysis using serial autocorrelation, heteroskedasticity, CUSUM were conducted. It was discovered that POS had the highest performance while internet banking had the least. More so, the variables are statistically significant. The authors recommended that internet accessibility should be made cheaper for easy access and usage. Banks should reduce the ownership cost of POS machine and rural banks should conduct periodic seminars and knowledge dissemination programmes for their rural customers so as to increase their knowledge of mobile banking activities.*

**Key Words:** *Financial Innovation, mobile banking, automated teller machine, online banking, point of sale.*

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## 1.0 Introduction

The form of payment in an economy is crucial to the effective operation of the financial and real estate sectors. A good payment system settles financial transactions quickly and allows the interchange of products and services in a timely, secure, and trustworthy manner (Tahir, Shah, Arif, Ahmad, Aziz, & Ullah, 2007). (2018). Victor, Obinozie, and Echeboba (2015) believe that the effectual use of various advanced banking technologies, as well as applications of Digitalization in banking operations, has become one reason for banks' deposit money to be redirected toward an unforeseen improvement in the setup of banking products and various instruments, which are key means to stimulate customer needs and, thus, the economy.

The application of new technologies to introduce new financial instruments into financial institutions and markets is referred to as "financial innovation." All types of innovation are covered, including process, product, and institutional. Process innovation includes new ways of doing business and utilising information technology, such as the Automated Teller Machine (ATM), mobile banking, and online banking (Abor, 2005). As per Abubakar & Tasmin, various financial innovative products, like automated teller machines, web/internet banking, and mobile banking, are a critical ingredient for bank diversification, sales growth, and cost reduction for both customers and banks, because customers can access their accounts through the aforementioned financial innovative products (2012).

Financial innovations have greatly impacted the financial market regarding the establishment of new and big opportunities for the shareholders, thus developing new products and services to improve new markets. Customers may access their accounts using their mobile phones, which increases income and lowers costs for both banks and customers (Abubakar & Tasmin, 2012; Zu, Gu, Li, & Bonsu, 2019).

Financial innovation necessitated the deployment of various electronic payment channels to enhance the performance of banks in term of return on investment, market share, efficient service delivery, etc. if properly utilized. It could also serve as a veritable tool or technique to give the bank an edge over its competitors. As per Kamau and Oluoch (2016), numerous banks have leveraged financial innovation as a potent tactical variable to overcome any sort of rivalry among deposit money institutions, allowing banks to increase their efficiency while preserving their market effectiveness.

The emergence of financial innovation as a tool to offer efficient services to banks' clients births the utilization of information technology infrastructure. As in Gbanador (2021), the hardware, software, networks and other relevant equipment that makes information technology based services possible is called Information technology infrastructure.

Financial innovation is predicted to improve the performance of deposit money banks. However, research findings revealed that opinions on the influence of financial innovation on financial performance of commercial banks are divided (see Abubakar, 2014; Ibenta & Anyanwu, 2017;

Njogu, 2019 and Tahir et al, 2018). These divergent views could be attributed to the possible difficulties and risk exposure that is associated with the deployment of financial innovation which could hinder its utilization. For instance, fraud, illiteracy, poor network, inadequate infrastructure, poor power supply, etc. This problem necessitates an empirical investigation of the impact of financial innovation on the performance of Nigerian deposit money banks.

### **Objectives of the study**

This study is aimed at finding the impact of financial innovations on the Deposit Money Banks, 2004 to 2021. Specifically, the study intends to:

- i. Examine the relationship between Online banking transactions and the performance of DMBs
- ii. Investigate the relationship between the Point of Sales (POS) transactions and the performance of DMBs
- iii. To examine the relationship between ATM transactions and performance of DMBs in Nigeria.
- iv. To study the relationship between mobile banking transactions and the performance of DMBs in Nigeria

### **Hypotheses of the Study**

H<sub>01</sub>: There is no significant relationship between online banking transactions and the performance of DMBs

H<sub>02</sub>: There is no significant relationship between POS transactions and the performance of DMBs

H<sub>03</sub>: There is no significant relationship between ATM transactions and the performance of DMBs

H<sub>04</sub>: There is no significant relationship between mobile banking transactions and the performance of DMBs

## **2.0 Literature Review**

### **2.1 Conceptual Review**

Financial innovations have greatly impacted the financial market in relating to the establishing up new and big opportunities for the shareholders, thus developing new products and services to improve new markets (Zu, Gu, Li & Bonsu, 2019). Some of the products that are upshots of financial innovations that are popular amongst the payments channels deployed by banks in Nigeria are; mobile banking, point of sales terminal, Automated teller machines, internet banking, etc. These products are hereby discussed in turns.

#### **(i) Mobile Banking**

This is a method of payment that enables a bank's client to effect financial transaction using a mobile phone. For this transaction to take place, the bank's client is expected to install the bank's

software in the mobile phone. The bank's client can use this payment channel to check account balance, make transfers, pay bills, etc.

***(ii) Point of sales terminal***

This is an electronic payment channel that allows payments to be made using either a debit or credit card via a portable device. This device is used at supermarkets, boutiques, restaurants, petrol stations, etc. most recently, it is used as a platform to make cash withdrawals thus birthing agency banking.

***(iii) Automated Teller Machine***

It is a computerized telecommunication device that allows the bank's customer to access the basic teller services outside the banking hall without direct interaction with a bank teller. Some of the teller services performed with the ATM includes Cash withdrawal, cash deposit, fund transfer, bills payment, account balance enquiry, account opening, etc (Gbanador, 2021).

***(iv) Internet Banking***

This is a payment channel that enables the bank customer to make financial transactions using the banks' website. Thus, financial transactions are accessed using the internet and a personal computer or similar device. It does not require physical interaction between the banks' customer and the bank teller once a biometrics has been done and enrollment made.

***2.2 Theoretical Framework***

This research is based on Everett M. Rogers' 1962 Diffusion of Innovation concept. The five variables necessary for the spread of new ideas, according to the theory, are the innovations themselves, adopters, communication routes, time, and a social structure. He considers diffusion to be the mechanism through which innovation spreads over time among users in a social system. Innovators, early adopters, early majority, late majority, and laggards are examples of innovation adopters. Diffusion can take several forms, depending on the types of adopters and the creative decision-making process. Innovativeness, which is defined as the degree to which an individual adopts a new notion, is the criterion for classifying adopters. According to Bamidele (2006), IT spread entails more than just obtaining computers, microelectronics-based devices, and related know-how. It entails being prepared and developing the technical change-generating competence to apply given technology to a variety of demands. According to these beliefs, innovation without communication, coordination, and understanding may be ineffective, as it is unlikely to yield significant results for either banks or customers. There must be prompt communication and information dissemination. This causes time awareness and a reduction in response time, which influences turnaround time.

The Schumpeter financial innovation theory is another foundation for this research. Schumpeter proposed this hypothesis in 1934. According to the hypothesis, technological innovation creates new profit potential as a result of increased investments by financial institutions/banks in new creative goods (Peteraf & Bergen, 2003 and Barney, 1991).

***2.3 Empirical Review***

The influence of financial innovation on the profitability of Nigerian Deposit Money Banks was explored by Akani and Tony-Obiosa (2020). The data was examined using a quasi-experimental approach and panel data regression analysis. The dependent variable was return on equity, whereas the independent variables were automated teller machines, electronic fund transfers, online banking, mobile banking, and investment in information communication technology (the independent variables). Automated teller machines and electronic cash transfers have a negative relationship with return on equity, as per the statistics, but mobile banking, internet banking, and investment in ICT have a positive relationship. As a consequence, the study recommends that Deposit Money Banks adopt financial innovations since they affect their performance.

Zu, Gu, Li, and Bonsu (2019) conducted research on the effects of financial innovation on African banks' financial performance from 2015 to 2018. The study was conducted using a descriptive research approach. The dynamic panel data approach was used in the study, as well as GMM predictions through a panel data regression model. The dependent variables were return on equity and return on assets, whereas the independent variables were bank cards, point of sale, automated teller machines, and online banking. With the exception of point of sale and online banking, the research demonstrated that bank cards and automated teller machines had a beneficial impact on a bank's financial success.

Kashmari, Nejad, and Nayebyazdi (2016) examined the impact of electronic banking on bank deposit shares. The study gathered secondary data from twenty-three banks between 2007 and 2013. The Granger Causality Test and Panel Data-Vector Autoregressive (Panel-VAR) techniques were used to analyse the data. According to the survey, point-of-sale terminals, the SWIFT system, ATM machines, mobile banking, personal identification numbers (PINs), and other financial services supplied by each bank have a causal relationship in improving the share. The bank's deposit share and the services it delivers have a bidirectional link as well.

Tahir et al. (2018) did a review to examine the impact of Pakistan's novel payment methods on the efficiency ratio (ER). The analysis relied on secondary data from the State Bank of Pakistan for the years 2007 to 2016. The data was analysed using multiple regression models, and the findings revealed a strong and positive association between Web/Internet transactions and Efficiency ratio. The results for Automated Teller Machines (ATM), Point of Sale (POS), and Mobile Banking (MOB) were statistically insignificant. As a result, the study recommends that new approaches be rebuilt in such a manner that personalization allows customers to access all banking services while lowering transaction fees.

Using a descriptive research approach, Gakure and Ngumi (2013) investigated the influence of bank innovation on the profitability of commercial banks in Kenya. The data was analyzed using multiple linear regression in this study. Financial innovation was proxied by mobile banking, automated teller machines, e-banking, debit and credit cards, point of sale terminals, and e-funds transfer as independent variables, while bank performance was proxied by profit after tax as the dependent variable.

Ibenta and Anyanwu (2017) studied the association among financial innovation and banks from 2006 to 2014. Ex-post facto research was used to do the research. Multiple regression was used to evaluate the data. The value of ATM transactions, value of Web banking transactions, value of mobile banking transactions, and value of point-of-sale transactions were used as independent variables, while the efficiency ratio of deposit money banks was employed as a dependent variable. The study's-controlled variables were the monetary policy rate and cash reserve ratios. According to the data, the value of transactions made at an ATM and at a Point of Sale (POS) is

inversely related to efficiency ratio, but web and mobile banking are positively related, with only web banking being significantly related.

## Methodology

### Research Design

The study's research design is based on an ex-post facto experimental research design. This design was utilized due to the nature of data involved, which is a time series data. The researcher shall use the design method in the cause of this study.

### Data Source

The data for this study came from the Statistical Bulletins of the Central Bank of Nigeria. Furthermore, the study's time frame is quarterly from 2009 to 2021.

### Model Specification

The functional form of the model is stated below:

$$DMB = f(ONT_t, POS_t, MoB_t, ATM_t)$$

The econometric estimation form of the functional specification of model above is presented as follows:

$$DMBs = \beta + \beta_1 ONT + \beta_2 POS + \beta_3 ATM + \beta_4 MoB + \mu$$

Where:

DMB = Deposit Money Banks Assets

ONT = Online Transactions

POS = Point of Sale Transactions

ATM = Automated Teller Machine

MoB = Mobile Banking Transactions

$u_t$  = Stochastic Term

*A priori* expectation =  $\beta_1 > 0, \beta_2 > 0, \beta_3 > 0, \beta_4 > 0$ .

### Data Analysis Technique

#### Pre-estimation Tests

The researcher conducted some pre-estimation tests such as descriptive analysis, tests of stationarity using the Augment Dickey-Fuller (ADF) method and bounds test for cointegration. These tests were to find out if the data used are suitable for the research work.

While the stationarity tests were conducted to determine the appropriate cointegration test to be used, the cointegration tests are conducted to determine the existence of long run relationship among the time series variables in the model. However, the choice of model estimation technique is premised on both the stationarity and cointegration tests.

#### Model Estimation

The Error Correction Model (ECM) and the Autoregressive Distributive Lag (ARDL) econometric techniques were used in this study. When all of the time series in the model are non-stationary, the ECM is computed; when the time series in the model have a mixed order of integration, the ARDL is produced. If  $Y_t$  and  $X_t$  are cointegrated, the relationship amid them may be expressed using an ECM specification as:

$\Delta Y_t = a_0 + b_1 \Delta X_t - \pi u_{t-1} + e_t$  This now has the advantage of including both long- and short-term data.  $b_1$  is the impact multiplier (short-run effect) in this model, which evaluates the immediate

influence of a change in  $X_t$  on a change in  $Y_t$ . The feedback effect, or adjustment effect, on the other hand, indicates how much of the disequilibrium is being addressed – that is, how much any disequilibrium from the preceding period influences any adjustment in  $Y_t$  (Neusser, 2016).

The ARDL model is based on ordinary least squares (OLS) and may be used to evaluate non-stationary and mixed-order time series. The following is the long run equation for the chosen ARDL (k) model:

$$Y_t = \delta_0 + \sum_{i=1}^k \alpha_i X_{1t} + \sum_{i=1}^k \alpha_2 X_{2t} + \dots + \sum_{i=1}^k \alpha_n X_{nt} + v_{1t}$$

Where:

$Xs(X_{1t}, X_{2t}, \dots, X_{nt})$  = explanatory or the long run forcing variables

k = number of optimum lag order.

The best-performing model calculates the corresponding Error Correction Model (ECM) estimations (Nkoro & Uko, 2016).

### Post-estimation Diagnostic Tests

On the estimated model, two crucial post-estimation residual diagnostic tests were performed. The serial autocorrelation test and heteroscedasticity are the two. The heteroscedasticity test determines if the regression's variance is constant over time, whereas the serial autocorrelation for the residual determines whether the independent variables have serial autocorrelation. The standard error will be large if the variance is not constant, resulting in poor analytical use of the data.

The researcher ran the CUSUM test once again to measure the model's strength.

To assess the causal links between the variables, a Granger causality test was utilized.

The researcher used eviews version 10 to conduct these analysis.

## Results and Data Analysis

### Descriptive Analysis

	DMB	ATM	ONT	MOB	POS
Mean	24897.22	4170.623	52.44533	305.9780	292.6873
Median	24897.22	4170.623	51.43562	346.4700	312.0700
Maximum	32913.78	8176.396	84.15000	674.0317	629.9028
Minimum	17331.56	399.7100	25.05000	1.270000	11.03000
Std. Dev.	5214.373	2606.494	15.12644	243.3847	221.9620
Skewness	-0.010489	-0.003142	0.313213	-0.011500	-0.006647
Kurtosis	1.785674	1.757897	3.421829	1.595958	1.625684
Jarque-Bera	0.798973	0.835716	0.308940	1.068093	1.023166
Probability	0.670664	0.658456	0.856869	0.586228	0.599546
Sum	323663.8	54218.09	681.7893	3977.714	3804.935
Sum Sq. Dev.	3.26E+08	81525747	2745.709	710833.1	591205.7
Observations	13	13	13	13	13



The descriptive statistic is a useful tool in economic studies since it allows the researcher to quickly identify the sort of data they're working with. The researcher looked at the skewness, kurtosis, and JB of the data set in the table above to see if it was normally distributed or not. Based on the results of the JB, All the variables are normally distributed as shown by their respective JB probability ratios (Prob>0.05).

### Unit Root: ADF Tests

Test at levels	Variables	P – Value	Order of Integration
	DMB	0.7923	I(1)
	ATM	0.7098	I(1)
	POS	0.9600	I(1)
	ONT	0.0001	I(0)
	MoB	0.9466	I(1)
Test at First Difference	Variables	P- Value	Order of Integration
	DMB	0.0000	I(0)
	ONT	0.0560	I(0)
	MoB	0.0596	I(0)
	ATM	0.0000	I(0)
	POS	0.0552	I(0)

Source: Authors computation using Eviews

The unit root test results are shown in the table able shows that the variables are stationary at various levels. However, ONT is stationary at levels. The mixture of the variables in the ADF analysis satisfies for the use of ARDL model in the regression analysis.

### Bounds Test for Cointegration

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Sig.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	4.831008	10%	2.75	3.79
k	5	5%	3.12	4.25
		2.5%	3.49	4.67
		1%	3.93	5.23

Source: Authors computation from Eviews



The author inferred that the order of integration for the variables in the provided model is not the same depending on the results of the stationarity test. The model showed a heterogeneous order of integration. As a result, the ARDL Bounds Cointegration test was chosen as the model's cointegration test. This is used to see if the variables in question have a long-term relationship. The test's result indicates that there is a long-term association between the dependent and independent variables over time.

### ARDL Model Estimation

#### LONG RUN RESULTS

**Dependent: DMB**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
@TREND	0.016594	0.006962	2.383321	0.0254
DMB(-1)*	0.578051	0.203848	-2.835691	0.0091
ATM**	1.065679	0.128858	8.270181	0.0000
POS**	5.334369	1.162590	4.588334	0.0000
ONT**	5.834198	2.381586	2.449711	0.0003
MoB	3.444112	1.063551	3.238313	0.0000

**Dependent: DMB**

#### SHORT RUN RESULT

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DMB(-1)	0.265679	0.128858	2.061797	0.0009
ATM	1.004369	0.162590	6.177311	0.0000
ONT	11.42209	0.128858	2.061797	0.0009
MoB	4.732069	2.118044	2.234215	4.732069
POS	3.356198	1.381586	2.429257	0.0000
CointEq(-1)*	-0.615251	0.136447	4.236441	0.0003
R-Squared =0.705612	F-Stat = 9.896152	Prob(F-stat) 0.000529	D-W stat=2.191892	

The ARDL model's long-run and short-run testing are presented in the findings above. The coefficient of determination, which measures the goodness-of-fit, indicates that the independent variables account for 71% of the variation in the dependent variable. The F-test, which examines the model's overall significance, is similarly statistically significant, and the yearly rate of adjustment between the short and long runs is 0.61 (61 percent).

#### Serial Autocorrelation Test

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.181883	Prob. F(2,22)	0.1675
Obs*R-squared	2.476123	Prob. Chi-Square(2)	0.1172

*Source: Author's computation from Eviews*

The serial or autocorrelation can be used to identify whether or not the variables are serially correlated. There is no difficulty with serial autocorrelation, as shown by the result using the Prob of F-stat (0.1675).

**Heteroskedasticity Test**

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	5.392499	Prob. F(7,24)	0.5632
Obs*R-squared	23.00632	Prob. Chi-Square(7)	0.3317
Scaled explained SS	32.55961	Prob. Chi-Square(7)	0.1270

*Source: Author's computation from Eviews*

The variance of the model is also constant based on the results of the heteroskedasticity test.

**Granger Causality Test**

Pairwise Granger Causality Tests

Date: 04/30/22 Time: 04:08

Sample: 2009 2021

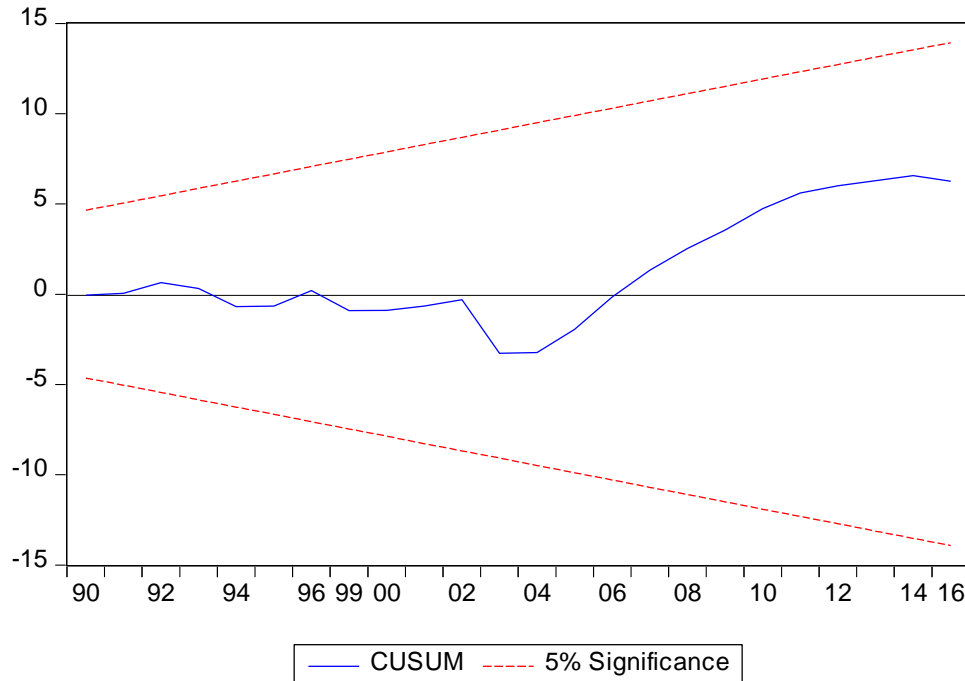
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
ATM does not Granger Cause DMB	11	3.52914	0.0970
DMB does not Granger Cause ATM		47.0322	0.0002
MOB does not Granger Cause DMB	11	1.54305	0.2880
DMB does not Granger Cause MOB		12.4898	0.0073
ONT does not Granger Cause DMB	11	0.42863	0.6699
DMB does not Granger Cause ONT		3.04294	0.1224
POS does not Granger Cause DMB	11	1.63041	0.2720
DMB does not Granger Cause POS		15.7887	0.0041

*Source: Author's computation from Eviews*

The pair-wise granger causality test reveals the cause-and-effect relationship between the dependent and independent variables. This does not necessarily connote a relationship between the variables. As shown above, there is a bidirectional causalities between the DMB and ATM, MOB, and POS. However, there is unidirectional causality between DMB and ONT over the period.

**CUSUM Test**



The CUSUM Test shows that the model is well specified.

### Tests of Hypotheses

**H<sub>01</sub>:** *there is no significant relationship between ONT and DMB in Nigeria.*

The results reveal that DMB and ONT have a positive association, as hypothesised a priori. DMB increases by 11.42209 for every unit increase in ONT, and vice versa. According to the t-test, ONT is statistically significant at a 5% level of significance. As a result, we will accept the alternative hypothesis, reject the null hypothesis, and conclude that DMB and ONT have a substantial association over time.

This demonstrates the significant impact that internet banking transactions have on deposit money institutions' holdings. It enables the DMB to increase the value of its assets by up to eleven times the value of online transactions.

**H<sub>02</sub>:** *there is no significant relationship between POS and DMB in Nigeria.*

Furthermore, the results demonstrate that DMB and POS have a positive association, as hypothesized a priori. DMB assets rise by 3.356198 for every unit increase in POS, and vice versa. POS is statistically significant at the 5% level of significance once more. As a result, we will accept the alternative hypothesis, reject the null hypothesis, and conclude that DMB and POS have a substantial association over time.

POS has become an important part of business and personal transactions in Nigeria. In recent times, the use of POS machines has increased due to its ease, availability and convenience. People can withdraw amounts that ATM machines cannot dispense and this makes it a choice of usage by the majority of the people.

**H<sub>03</sub>:** *there is no significant relationship between ATM and DMB assets in Nigeria.*

Interestingly, the results demonstrate that DMB and ATM have a positive connection, as hypothesized a priori. DMB assets rise by 1.004369 for every unit increase in ATM, and vice versa. ATM is statistically significant at the 5% level of significance once more. As a result, we will accept the alternative hypothesis, reject the null hypothesis, and conclude that DMB and ATM have a substantial association over time.

AS with the proliferation of POS machines, ATM have also been set up at strategic places across the cities to aid financial transactions. The use of the ATMs have increased over the period and this has continued to increase as shown in the trend.

**H<sub>04</sub>:** *there is no significant relationship between MoB and DMB assets in Nigeria.*

Finally, the results demonstrate that DMB and MoB have a positive connection, which is as predicted a priori. DMB assets grow by 4.732069 when MoB increases by a unit, and vice versa. MoB is statistically significant at the 5% level of significance once more. As a result, we will accept the alternative hypothesis, reject the null hypothesis, and conclude that DMB and ATM have a substantial association over time.

The emergence of the internet has increased mobile banking transactions. It is the first in the innovative line in the banking sector. Unfortunately, the inability of the major populace to access the internet has limited the use of the internet banking over the years.

### **Discussion of the Findings**

Over the years, innovative financial solutions have been a key research focus. To examine the topic matter, researchers employed a variety of approaches and factors.

The results on the relationship between online transactions (ONT) and DMB assets are in contrast to those of Akani & Tony-Obiosa (2020), who looked at the impact of financial innovation on the profitability of Nigerian Deposit Money Banks. Their studies found that online banking and ATMs had a negative but considerable impact on commercial banks' return on equity in Nigeria.

However, this conclusion is consistent with Zu, Gu, Li, and Bonsu (2019), who conducted a study to investigate the effects of financial innovation on African banks' financial performance from 2015 to 2018. They discovered that internet, POS, and ATM transactions had a favourable and substantial link with commercial bank profitability in Nigeria.

Kashmari, Nejad, and Nayebyazdi (2016) looked at how electronic banking innovation affected bank deposit shares. They discovered that mobile banking platforms and deposit money banks had a causal link. This study supports the findings of the previous study, which demonstrated a favourable and substantial link between deposit money bank assets and mobile banking platforms.

## Conclusion and Recommendations

Based on a survey of empirical literatures as well as assessments of mobile banking platforms and deposit money bank assets. Many research investigations have shown that mobile banking platforms and deposit money banks have a beneficial and substantial association.

POS was found to be the most active of all the banking platforms. This is due to its ease of use, convenience and accessibility by majority of the people in rural areas. Unlike the ATMs, POS machines can be moved from one place to the other and there is no limit to the amount one can withdraw.

Further, ATM was close because of its ease of use and lower rate than POS. However, it is not easily accessible to many people in the rural areas. It is also limited to a certain amount that can be withdrawn.

Finally, internet banking and mobile banking were not as actively being used as the ATM and POS because of people's limited knowledge on their usage. Accessibility to the internet could also be a major factor to their usage. However, all the independent variables were found to have a positive and significant relationship with the deposit money banks assets over the period.

In view of the above therefore, the author recommends thus;

- (i) Internet accessibility should be made cheaper. This recommendation comes as a result of the importance of internet in the use of alternative banking platforms. It will help increase its usage, especially in the rural areas.
- (ii) POS has been shown to be ahead of the other banking alternative platforms and must be encouraged. This could come in lower ownership costs and reduced chargers by the DMBs. However, more security such as two-way authentication if a certain amount is exceeded. This will reduce the incidences of theft using stolen ATM cards.
- (iii) Rural bank branches should be encouraged to hold periodic awareness for their customers as this will improve their knowledge of using alternative banking platforms.

## References

- Abor, J. (2005), Technological Innovations and Banking in Ghana: An Evaluation of Customers' Perceptions. *IFE Psychologia: An International Journal*, 13(1), 170-187.
- Abubakar, A. (2014). The effects of electronic banking on growth of deposit money banks in Nigeria. *European Journal of Business and Management*, 6(33), 79-89.
- Abubakar, A. A. & Tasmin, R. B. H. (2012), The Impact of Information and Communication Technology on Banks' Performance and Customer Service Delivery in the Banking Industry, *International Journal of Latest Trends in Finance and Economic Sciences*, 2(1), 80-90.
- Akani, H.W & Tony-Obiosa, R.L. (2020), Effects of financial innovations on the profitability of deposit money banks in Nigeria. *European Journal of Accounting, Auditing and Finance Research*, 8(1), 53-73.

- Bamidele, F. (2006). Who is afraid of e-payment? Mileage Business Magazine 16th Edition Lagos Carriage: Concepts Communications Ltd. In Idowu, et al (2019) *Journal of Association of Professional Bankers in Education*, 5(1), 1-30.
- Barney, J. (1991), Firm Resources and Sustained Competitive Advantage, *Journal of Management*, 17(1), 99-120.
- Gbanador, M.A. (2021). *Fundamentals of banking: Theory and practice*. Port Harcourt: Akanistic Ventures.
- Gakure, R. & Ngumi, P. (2013). Do Bank Innovations Influence Profitability of Commercial Banks in Kenya, *Prime Journal of Social Science*, 2(3), 237-248.
- Ibenta, S.N. & Anyanwu, F.A. (2017). Financial Innovation and Efficiency on the Banking Sub-sector: The Case of Deposit Money Banks and Selected Instruments of Electronic Banking (2006 - 2014). *Asian Journal of Economics, Business and Accounting* 2(1), 1-12.
- Kamau, D.M. & Oluoch, J. (2016). Relationship between financial innovation and commercial banks performance in Kenya. *International Journal of Social Sciences and Information Technology*, 2(4), 34-47.
- Kashmari, A., Nejad, A. H. G., Nayebyazdi, A. (2016), Impact of Electronic Banking Innovations on Bank Deposit Market Share, *The Journal of Internet Banking and Commerce*, 21(1), 1-12.
- Njogu, J. N. (2019). The effect of electronic banking on profitability of commercial banks in Kenya. *International Journal of Financial Services Research*, 22(2), 93-117.
- Peteraf, M. A. & Bergen, M. E. (2003), Scanning Dynamic Competitive Landscapes: A Market-Based and Resource-Based Framework, *Strategic Management Journal*, 24(10), 1027-1041.
- Tahir, S.F., Shah, S., Arif, F., Ahmad, G., Aziz, Q., & Ullah, M.R. (2018). Does financial innovation improve performance? An analysis of process innovation used in Pakistan. *Journal of innovation Economics and management*, 3(27), 195-214.
- Victor, O. I., Obinozie, H. E., Echekeba, F. N. (2015), The Effect of Information Communication Technology and Financial Innovation on Performance on Nigerian Commercial Banks 2001-2013, *International Journal of Accounting Research*, 42(2437), 1-16.
- Zu, J., Gu, Y., Li, K., & Bonsu, O.M. (2019). Impacts of financial innovations on financial performance evidence of electronic banking in Africa. *International Journal of Scientific Engineering and Science*, 3(7), 56-60.