ELECTRONIC BANKING SYSTEMS AND THE PERFORMANCE OF DEPOSIT MONEY BANKS IN NIGERIA

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ABSTRACT

This study examined the influence of electronic banking systems (e-banking) on performance of deposit money banks (DMBs) in Nigeria. The study adopted an ex-post facto research design and utilized secondary data collected from the Central Bank of Nigeria's statistical bulletin. Monthly time series data spanning 2019 to 2021 served the study. The Augmented Dickey Fuller (ADF) and Phillips-Perron were used to test for stationarity. Other econometric tests like Ramsey Reset test, heteroskedasticity test, Breusch-Godfrey serial correlation LM test, Johansen cointegration test, Parsimonious Error Correction model and the fully modified Least Square were used for data analysis. The study found that, in the short-run, e-banking systems had no significant impact on performance of DMBs in Nigeria. However, the result from the long-run analysis revealed that ATM and POS positively and insignificantly influence performance of DMBs in Nigeria while Mobile banking has a positive and significant impact on DMBs' performance. The result from the Johansen Cointegration and the fully modified least squares shows evidence of long-run relationship between e-banking and DMBs' performance. Thus, the study concludes that e-banking influences performance of DMBs in Nigeria, and recommends that DMBS should sensitize clients regarding the benefit of using ATM, POS and other e-payment channels; and also offer quality mobile banking services to sustain their performance.

Keywords: Automated teller machine, bank performance, electronic banking systems, mobile banking, point of sale, web banking

INTRODUCTION

Previously, banks performed their various functions manually. This system of banking has a lot of drawbacks: it requires customers to visit the banking hall for transactions be consummated, it makes cash handling costly, delays service processes, limits number of services, enables fraud, and over labours employees. However, with the adoption of innovative modern technology and various technology enabled systems is believed to reduce these challenges and also enhance service provision of banks (Gbanador, 2021). The introduction of electronic banking (e-banking) triggered the deployment of several electronic payment (e-payment) channels, including automated teller machines (ATM), mobile banking (MB), internet banking (IB), point of sales (POS), NIBSS instant payment (NIP), etc.

The deregulation of the banking sector in 1986 marked the evolution of e-banking in Nigeria (Oluwatolani et al., 2011; Abubakar, 2014). However, the wide scaled deployment of electronic infrastructure as alternative payment systems in Nigeria started in 2012 following the introduction of two different but complementary policies by the Central Bank of Nigeria (CBN): the sustainable banking principles and the cashless policy. The sustainable banking principles for Banks, discount houses and development institutions in Nigeria was intended to offer positive development impact on society while safeguarding the communities and environment where financial institutions and their customers operate (Gbanador, 2018). The cashless policy on the other hand, was implemented

nationally in July 2013 to reduce reliance on cash transactions and also to reduce illicit activities. In order to achieve the aims of these CBN policies, banks became more aggressive in the deployment of e-banking products like, POS, internet banking, telebanking, mobile banking, automated teller machine, NIBSS instant payment (NIP), NIBSS electronic fund transfer (NEFT), etc.

Banking as a sub-sector of the financial sector of Nigeria's economy has been the principal driver of growth and development. This is evidenced in the impressive performance of banks on the Nigerian Stock Exchange market. Banks concentrate on acceptance of deposits and settlements of financial obligations. E-banking operations focus on the payment aspect of banking activities, and for that reason, most technology innovations are to support payment activities. Most recently, e-payment innovations have ushered payment channels and subsequent establishments of financial technology companies (Mustapha, 2018). Similarly, Gbanador et al. (2022) opined that advances in technology enable banks to provide services to customers more efficiently.

The dynamic and unique nature of the financial industry and the move to a cashless economy necessitated the adoption of e-banking systems that enable customers to conclude transactions without visiting the bank physically. This is made possible because transactions are done using necessary *information technology infrastructure* (the hardware, software, networks and other relevant equipment that makes information technology based services possible) (Gbanador 2021). E-payment technologies have enhanced service delivery and financial performance of banks in Nigeria. This is due to the far-reaching transformation through computerization of service delivery channels. This has also increased operational cost since the information technology infrastructure is capital intensive. Thus, making banks invest hugely in the developments of e-payment technologies in order to remain competitive (Mustapha, 2018; Oluwatolani et al., 2011).

It is expected that the adoption of innovative service delivery and e-payment channels will enhance service delivery, market share, and financial performance of banks. However, this could be hindered by certain difficulties faced by customers while utilizing e-payment channels. Some of these issues depending on the service delivery channel includes illiteracy, network challenge, multiple deductions, long queues, possibility of fraud, and other exposures to risks (Chibueze et al., 2013) as fraudulent practices experienced by Nigerian banks increased with the adoption of e-banking.

Previous studies on e-banking systems and performance of deposit money banks (DMBs) measured performance using Return on Assets (ROA), Profit before tax (PBT), Net interest Margin (NIM), and Return on equity (ROE) rather than DMB Total Asset (DMBTA). This creates a gap which this study intends to bridge by assessing the influence of e-banking systems on total assets of DMBs in Nigeria.

LITERATURE REVIEW

Theoretical Foundation of the Study

The theory upon which this study is anchored is the Technology Acceptance Model (TAM) (Davies, 1989) which stipulates that users' acceptance of technology is built on its perceived usefulness and the ease of use. TAM employs psychometric scales in measuring perceive usefulness and ease of use. The implication of this theory is that users of technology will accept a technology if it is useful and also easy to utilize. Though, the TAM is criticized because of some

reasons amongst which is its failure to put into consideration the cost of deploying technological infrastructure, the usefulness of the theory is eminent because it is one of the prominent theory regarding the adoption of information technology by corporations. E-payment channels provided by banks to clients are expected to be easy to use as well as useful to both the bank and clients, else the purpose for which it was deployed is be defeated.

Concept of E-Banking Systems

E-banking is the use of electronic signals or information technology to provide banking services, such that banks' customers can consummate certain financial transactions without visiting the bank. The use of e-banking platforms minimizes the use of cash and cheques for payment, and withdrawal slip for cash withdrawals. While e-banking systems do abolish cash transactions, they serve as alternative means of effecting transaction without using physical cash or payment instrument like cheque (Gbanador, 2021). The adoption of e-banking ushered different e-payment channels: online banking, ATM, mobile banking, POS, and NIBSS instant payment amongst others. Online banking is an e-payment system that allows customers to consummate financial transaction via banks' websites. This type of e-banking is performed through the use of a personal computer that has internet access. Online banking system is also known as *Internet banking*, and allows customers to perform secured banking and financial transactions through the internet. These services are offered without physical interaction between customers and banks' staff. Firms opt for internet banking because it eases consummation of transactions (Gbanador, 2021).

ATM is a computerized telecommunication device that allows banks' customers to access basic teller services outside the banking hall without direct interaction with a banks' teller. Some of the teller services performed with ATM includes cash withdrawal, cash deposit, fund transfer, bills payment, account balance enquiry, account opening etc. Thus, with the ATM, customers can consummate certain financial transactions without visiting the bank (Gbanador, 2021).

Mobile banking is an e-banking system that allows banks' customers to consummate transactions via a mobile phones and other devices. It is performed using a Smartphone or similar device that is installed with the bank's software. It may also require the customer to do simple biometrics to enable its usage. The customer is usually granted access to consummate transactions via the mobile device after signing in their username and password for authentication. Mobile banking channel require internet access before making transactions. A variant of mobile banking is *telebanking* which allows customers to perform rudimentary bank transactions via a phone without an internet network. These services are accessed by dialing a designated number or code that is provided by the bank. After dialing the number or code, there will either be a voice prompt or message prompt instructing the customer on the necessary steps required to accessed the banking services. A first time customer will usually be required to create a token or change the default personal identification number (PIN) for security purposes (Gbanador, 2021).

POS is a portable device or machine that enables payment for goods and services using a bank card. In Nigeria, POS is used in supermarkets, petrol stations, boutiques, churches, etc. it is a valid means of payment amongst urban dwellers. As an e-payment system, using POS requires the cardholder to insert a bank card in the machine, input their PIN and the amount to be debited and then click (OK) to effect payment. Once the transaction is completed, the machine will print two copies of receipt, one for the cardholder, and one for the merchant (Gbanador, 2021).

NIBSS instant payment (NIP) is an e-payment system and it is the first and only point to point fund transfer service that guarantees instant value to beneficiaries. This service is majorly offered via bank's internet banking, mobile and bank branch platforms for corporate and individuals as well as through the bank's branch network (Essien, 2019).

Performance of Deposit Money Bank

Performance in business describes the health of a firm as an outcome of business programmes and activities measured against stated objectives or compared to the health of competing firms (Ateke & Akani, 2018). It is a measure of the extent to which the firm achieves its nominated objectives. Size of bank, quantum of deposit and profitability could be considered reliable indicators of performance (Ibekwe, 2021) for banks. However, performance of DMBs could be viewed from different angles, depending on how well a bank has fared over a specified period of time. Most common performance indicators are volume of deposit, total asset, customer base and profitability. For the purpose of this study however, DMBs' Total Asset (DMBTA) was adopted as a proxy for performance. DMBTA represents all the assets and resources of a bank that has economic value whose reward is expected in the future.

E-Banking Systems and Banks' Performance

Previous studies on e-banking systems and banks' performance exists in literature; and these studies mostly suggests that e-banking systems enhances different facets of performance of banks. Eze and Egoro (2016) examined the influence of e-banking on profitability of commercial banks in Nigeria; and reported that e-banking has significant impact on profitability of commercial banks. Similarly, Deekor (2021) assessed e-banking and deposit money bank's performance in Nigeria using quarterly data spanning 2010 to 2018. Net interest margin was used as proxy for banks performance while ATM, POS, mobile banking and web pay were used as proxies for e-banking. The study found that ATM, POS and web pay do not have significant effect on Net interest margin while mobile banking have a positive and significant relationship with net interest margin.

In a related study, Raymond et al. (2022) examined the impact of Net interest margin on Banks' performance in Nigeria within the period of 2009 to 2017. The study adopted net interest margin to represent performance, while ATM, POS, WB and MB were used as dimensions of e-banking. The findings via the Johansen cointegration test reveals a long-run relationship between e-banking and Banks' performance in Nigeria. Also, Chukwukaelo et al. (2018) examined effects of information technology adoption on performance DMBs in Nigeria. The study relied on historical data, while ROE was employed as a proxy for performance. POS, internet banking, ATM and mobile banking were used as dimensions of information technology adoption. The findings revealed that the overall effect of e-banking on profitability of DMBs in Nigeria was significant and positive.

In addition, Abubakar (2014) investigated influence of e-banking on growth of DMBs in Nigeria. The study adopted the secondary data, while multiple regression was utilized to analyze the data. The findings indicates a positive connection between mobile banking and total deposits, and between internet banking and total asset while on the other hand, no significant relationship was found between internet banking and total deposits, and between mobile banking and total asset. In a study by Njogu (2019) on influence of e-banking on profitability of commercial banks in Kenya, it was revealed that a strong relationship exists between e-banking and profitability of banks.

Abaenewe et al. (2013) investigated the profitability performance of Nigerian banks following the full adoption of e-banking systems. Profitability performance of banks was measured in terms of returns on equity. The findings revealed that the adoption of e-banking positively and significantly improved ROE of Nigerian banks. Again, Okonkwo and Ekwueme (2022) examined the effect of e-payment on financial performance of DMBs in Nigeria using time series data spanning 2009 to 2019. ROA was used as a proxy for the dependent variable while ATM and POS were used as proxies of the independent variable. The findings revealed that the ATM has positive but insignificant effect on ROA while the POS has a negative but insignificant relationship on ROA.

Furthermore, Nwakoby et al. (2018) investigated the effect of ICT adoption on performance of DMBs in Nigeria from 2006 to 2015. ROE was utilized as proxy for performance of banks while ATM, POS, mobile money, web payment and interbank transfer were used as proxies for ICT adoption. The findings indicates that utilization of ICT positively affects performance of DMBs in Nigeria in terms of ROE.

METHODOLOGY

This study adopted an ex post facto research designs. The rationale behind the adoption of this research design was due to the nature of the sources of data used for the study. A monthly time series data spanning 2009 to 2021 was obtained from the CBN Statistical Bulletin while the Ordinary Least Squares (OLS) multiple regression econometric technique was used to analyze the data. DMBTA was used to proxy performance of DMBs while the ATM, POS and MB were used to proxy e-banking systems.

Model Specification

The functional specification of the model is presented as:

$$DMBTA = f(ATM, POS, MB) \quad (1)$$

Where:

DMBTA = Deposit Money Bank Total Assets

ATM= Automated teller machine

POS = Point of sales

MB = Mobile banking

The OLS linear regression equation based on the above functional relation is;

$$DMBTA = \beta_0 + \beta_1 ATM + \beta_2 POS + \beta_3 MB + U_t \quad (2)$$

DMBTA, ATM, POS and MB are as defined earlier while;

β_0=Regression Constant

$\beta_1, \beta_2 \beta_3,$ and β_4 = Regression coefficient.

U_t =Stochastic Error Term

If equation (2) is tested in its logarithmic form (Log-linear) it becomes:

$$LogDMBTA = \beta_0 + \beta_1 LogATM + \beta_2 LogPOS + \beta_{3L}ogMB + \mu_t \quad (3)$$

$\beta_1, \beta_2, \beta_3, \beta_4 > 0$,

Where:

Log = Logarithmic Form

Pre-estimation Tests

The researchers conducted pre-estimation tests like stationarity test using the Augmented Dickey Johansen test for cointegration. The rational for conducting these tests was to examine if the data employed for the study was suitable. The stationarity tests was conducted to check the appropriate

cointegration test to be employed. Cointegration tests are utilized to examine the presence of long run relationship among time series variables in a model.

DATA ANALYSIS AND RESULTS

The analysis and results of the various tests conducted in this study are discussed in this subsection.

Table 1: Descriptive Analysis

	LDMBTA	LATM	LPOS	LMB
Mean	17.69221	13.89199	13.23507	14.02331
Median	17.72146	14.16469	12.84650	13.97775
Maximum	17.92774	14.71232	14.65637	15.41266
Minimum	17.46236	13.05156	12.17265	12.35626
Std. Dev.	0.150558	0.525307	0.844808	0.994192
Skewness	-0.090715	-0.411728	0.570420	-0.006620
Kurtosis	1.590667	1.542830	1.663091	1.565907
Jarque-Bera	3.028705	4.202132	4.633259	3.085197
Probability	0.219951	0.122326	0.098605	0.213825
Sum	636.9195	500.1116	476.4625	504.8390
Sum Sq. Dev.	0.793369	9.658150	24.97953	34.59460
Observations	36	36	36	36

Source: Researcher's computation using E-views version 12

The descriptive statistic enables the researcher to take visual inspections on the type of data and its nature. The Jarque-Bera probability was employed to check whether the variables are normally distributed or not. The result revealed that Web banking is not normally distributed as the JB Prob. < 0.05. However, all other variables are normally distributed as there JB Prob. > 0.05.

Table 2: Unit Root (Stationarity) Test

Variables	Augmented Dickey-Fuller (ADF) Test Statistic	Phillips-Perron (PP)Test Statistic	Mackinnon's Critical Values at 1%, 5% and 10% respectively			Order of Integration	Prob.
LDMBTA	-6.038887	-6.043247	-3.639407	-2.951125	-2.614300	I(1)	0.0000
LATM	-6.478560	-10.85253	-3.639407	-2.951125	-2.614300	I(1)	0.0000
LPOS	-6.561798	-6.516457	-3.639407	-2.951125	-2.614300	I(1)	0.0000
LWB	-5.748470	-5.771564	-3.639407	-2.951125	-2.614300	I(1)	0.0000
LMB	-8.776998	-12.02673	-3.639407	-2.951125	-2.614300	I(1)	0.0000

Source: Researcher's computation using E-views version12.

Both the Augmented Dickey-Fuller and the Phillips-Perron unit root test were conducted to test for stationarity. The test results as shown in Table 2 indicates that all the variables are stationary at order (1). The outcome of the unit root test of these variables in the ADF and PP analyses satisfies the condition for the adoption of Johansen Cointegration test.

Table 3: Johansen Cointegration Test

Date: 12/30/22 Time: 13:48
Sample (adjusted): 2019M03 2021M12
Included observations: 34 after adjustments
Trend assumption: Linear deterministic trend
Series: LDMBTA LATM LPOS LWB LMB
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.649966	80.34429	69.81889	0.0057
At most 1	0.496701	44.65365	47.85613	0.0969
At most 2	0.371964	21.31026	29.79707	0.3386
At most 3	0.132727	5.494890	15.49471	0.7542
At most 4	0.019030	0.653249	3.841465	0.4190

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.649966	35.69064	33.87687	0.0301
At most 1	0.496701	23.34339	27.58434	0.1593
At most 2	0.371964	15.81537	21.13162	0.2358
At most 3	0.132727	4.841640	14.26460	0.7617
At most 4	0.019030	0.653249	3.841465	0.4190

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Source: Researcher's computation using E-views 12

Table 3 depicts the Johansen cointegration test results. The Johansen cointegration test as measured by the Trace statistic and Maximum Eigenvalue reveals that there exist a cointegrated equation at 5% level of significance. The implication of this result is that there exist a long-run equilibrium relationship between Electronic banking systems and Deposit Money Bank Total Assets in Nigeria.

Table 4: Parsimonious Error Correction Model Result

Dependent Variable: D(LDMBTA)
Method: Least Squares
Date: 01/07/23 Time: 12:47
Sample (adjusted): 2019M03 2021M12
Included observations: 34 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LDMBTA(-1))	0.009074	0.186438	0.048668	0.9616
D(LATM)	-0.011142	0.011995	-0.928846	0.3619
D(LPOS)	-0.011710	0.012261	-0.955062	0.3487
D(LPOS(-1))	-0.007257	0.013074	-0.555094	0.5838
D(LWB)	0.003244	0.002911	1.114473	0.2757
D(LMB)	0.013818	0.012369	1.117154	0.2746
D(LMB(-1))	-0.011379	0.011589	-0.981921	0.3355
ECM(-1)	-0.221888	0.101283	-2.190770	0.0380
C	0.013209	0.004015	3.290189	0.0030

R-squared	0.252182	Mean dependent var	0.013135
Adjusted R-squared	0.012880	S.D. dependent var	0.013835
S.E. of regression	0.013746	Akaike info criterion	-5.514277
Sum squared resid	0.004723	Schwarz criterion	-5.110241
Log likelihood	102.7427	Hannan-Quinn criter.	-5.376489
F-statistic	1.053823	Durbin-Watson stat	2.036804
Prob(F-statistic)	0.424772		

Source: Researcher's computation using E-views 12

The short-run parsimonious error correction model result is presented in Table 4. The result indicates that ATM at current level with a prob. value 0.3619 and coefficient of -0.011142 has an inverse and insignificant impact on DMBTA. The coefficient shows that every 1% increase in the performance of ATM will lead to 1.11% decrease in the value of DMBTA.

Secondly, the result regarding POS in the current month has a negative and insignificant impact on DMBTA based on its prob. value of 0.3487. Its coefficient of -0.011710 reveals that a 1% increase in the value of POS decreases the performance of DMBTA by 1.17%. Furthermore, POS lagged 1 month had inverse and insignificant effect on DMBTA. The coefficient of -0.007257 implies that a 1% rise in the value of POS will lead a 0.73% fall in the value of DMBTA.

Thirdly, current level of MB had positive and insignificant effect on DMBTA. The coefficient of 0.013218 revealed that a 1% rise in MB will increase DMBTA by 1.38%. The study also observed that MB lagged 1 month negatively influence DMBTA. However, the negative influence of MB lagged one month is insignificant. Its coefficient of -0.011379 indicated that a 1% increase in MB decreased DMBTA by 1.14%. MB had positive and insignificant impact on current level of DMBTA in the short-run but the sign for MB changed when it is lagged by one month. ATM and POS had negative and insignificant effect on current level of DMBTA. The error correction term validates the outcome of the Johansen cointegration test as the coefficient of the ECM was negative and significant at 5% level. The estimated coefficient of 0.221888 implies that the model adjust to long-run DMBTA level following short-run shocks at a rate of 22.19%. Thus, 22.19% of the deviation from short-run to the long-run is corrected monthly.

Table 5: Fully Modified Least Squares Result

Dependent Variable: LDMBTA
Method: Fully Modified Least Squares (FMOLS)
Date: 01/07/23 Time: 16:29
Sample (adjusted): 2019M02 2021M12
Included observations: 35 after adjustments
Cointegrating equation deterministics: C
Long-run covariance estimate (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LATM	0.033308	0.031496	1.057539	0.2987
LPOS	0.013924	0.020269	0.686935	0.4974
LWB	0.007983	0.005428	1.470771	0.1518
LMB	0.106270	0.022404	4.743346	0.0000
C	15.43947	0.352377	43.81521	0.0000

R-squared	0.953922	Mean dependent var	17.69877
Adjusted R-squared	0.947778	S.D. dependent var	0.147432
S.E. of regression	0.033691	Sum squared resid	0.034053
Long-run variance	0.000905		

Source: Researcher's computation using E-views 12.

The fully modified least squares result displayed in Table 5 was used to explain long-run effect of the variables. The result reveals that ATM has a positive and insignificant effect on DMBTA. The coefficient of 0.033308 shows that a 1% increase in the value of ATM will increase DMBTA by 3.33%. From the result, POS has a positive and insignificant impact on DMBTA. The coefficient of 0.013924 reveals that a 1% rise in POS will increase the DMBTA by 1.39%. Furthermore, MB has a positive and significant impact on DMBTA. The coefficient of 0.106270 shows that a 1% increase in MB will increased DMBTA by 10.63%. Finally, the result shows the combine correlation of the independent variable (R^2) of 95.39% with the dependent variable. The adjusted R^2 of 0.947778 suggests that 94.78% of the variations in the performance of DMBs can be explained by variations in the value of e-banking systems at 5% level of significance.

Table 6: Correlogram Q-Statistic

Date: 01/07/23 Time: 12:57
Sample (adjusted): 2019M03 2021M12
Q-statistic probabilities adjusted for 8 dynamic regressors

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob*
. | . |	. | . |	1	-0.030	-0.030	0.0335	0.855
. | . |	. | . |	2	0.034	0.033	0.0769	0.962
. |*. |	. |*. |	3	0.134	0.136	0.7815	0.854
**| . |	**| . |	4	-0.343	-0.343	5.5913	0.232
. |*. |	. |*. |	5	0.083	0.077	5.8808	0.318
.*| . |	.*| . |	6	-0.118	-0.127	6.4868	0.371
.*| . |	. | . |	7	-0.104	-0.014	6.9733	0.432
. | . |	.*| . |	8	0.037	-0.109	7.0379	0.533
.*| . |	. | . |	9	-0.088	0.004	7.4157	0.594
. | . |	. | . |	10	0.051	-0.024	7.5501	0.673
. | . |	. | . |	11	0.055	0.050	7.7132	0.739
. | . |	. | . |	12	-0.028	-0.058	7.7567	0.804
. | . |	.*| . |	13	-0.041	-0.097	7.8543	0.853
.*| . |	.*| . |	14	-0.146	-0.175	9.1525	0.821
.*| . |	.*| . |	15	-0.182	-0.191	11.296	0.731
. | . |	. | . |	16	0.031	0.025	11.363	0.787

*Probabilities may not be valid for this equation specification.

Source: Researcher's computation using E-views 12.

The Correlogram Q-Statistic test was conducted to check the presence of serial correlation. The result obtained as presented in Table 6 reveals that there is no evidence of serial correlation amongst the variables used in building the model as the various probability values are greater than 0.05 (P>0.05).

Table 7: Breusch-Godfrey Serial Correlation LM Tests

F-statistic	0.130439	Prob. F(2,23)	0.8784
Obs*R-squared	0.381322	Prob. Chi-Square(2)	0.8264

Source: Researcher's computation using E-views 12.

The Breusche-Godfrey Serial Correlation LM test result in Table 7 shows that there is no serial correlation amongst the variables.

Table 8: Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.107433	Prob. F(8,25)	0.9986
Obs*R-squared	1.130020	Prob. Chi-Square(8)	0.9973
Scaled explained SS	0.597629	Prob. Chi-Square(8)	0.9997

Source: Researcher's computation using E-views 12

The Breusch-Pegan-Godfrey test was used to test the presence of Heteroskedasticity using it F-statistic and the Observed R-Squared. The outcome shows that this model is Homoskedastic as their values are both higher than the P-value of 0.05. Thus, there is no problem of heteroskedasticity in the result.

Table 9: Ramsey RESET Test

Ramsey RESET Test
Equation: UNTITLED
Omitted Variables: Squares of fitted values
Specification: D(LDMBTA) D(LDMBTA(-1)) D(LATM) D(LPOS) D(LPOS(-1)) D(LWB) D(LMB) D(LMB(-1)) ECM(-1) C

	Value	df	Probability
t-statistic	1.015724	24	0.3199
F-statistic	1.031696	(1, 24)	0.3199
Likelihood ratio	1.431026	1	0.2316

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	0.000195	1	0.000195
Restricted SSR	0.004723	25	0.000189
Unrestricted SSR	0.004529	24	0.000189

LR test summary:

	Value
Restricted LogL	102.7427
Unrestricted LogL	103.4582

Source: Researcher's computation using E-views 12.

The Ramsey Reset Test shows that the model is stable and well specified.

CONCLUSION AND RECOMMENDATIONS

This study examine the influence of e-banking systems on performance of DMBs in Nigeria. The findings from the short-run results shows that e-banking systems have no significant impact on performance of DMBs in Nigeria within the study period. However, the result from the long-run analysis revealed that the ATM and PSO as e-banking systems positively and insignificantly influence performance of DMBs in Nigeria while MB has a positive and significant impact on performance of DMBs in Nigeria. The result from the Johansen Cointegration and the fully modified least squares shows evidence of long-run relationship between the e-banking and performance of DMBs in Nigeria. Based on the findings, the study concludes that adoption of e-banking systems by banks by can lead to improved performance in terms of DMBTA. The study therefore recommend that DMBs in Nigeria should sensitize clients regarding the benefit of using ATM, POS, and other e-payment channels; and to continue offering quality mobile banking services to sustain their performance.

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