ELECTRONIC BANKING AND BANK PERFORMANCE IN NIGERIA: A CO-INTEGRATION AND ERROR CORRECTION MODEL APPROACH

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Abstract
This study examined the relationship between electronic banking and the performance of deposit money banks (DMBs) in Nigeria using ex-post facto research design. Quarterly time-series data of mobile banking, automated teller machine, internet banking, point of sales and return on assets were obtained from the Central Bank of Nigeria Statistical bulletin during the period 2009-2019. Data obtained were analyzed using both descriptive (mean, standard deviation, and Pearson correlation) and inferential (unit roots, co-integration, error correction model, Jacque-Bera test and variance inflation factor test) statistical techniques. Findings revealed that mobile banking, automated teller machine and point of sales were statistically significant, suggesting that they are critical technological factors enhancing financial performance of banks. On the other hand, internet banking found to be statistically insignificant with financial performance of banks, implying that they are weak factor enhancing financial performance of banks in Nigeria. In effect, the study concludes that electronic banking has effect on deposit money banks financial performance in Nigeria. Based on the findings, it was recommended among others that banks should encourage their customers to key into their mobile banking ideology. Again, bank should be able to determine the technical background of the majority of its customers before endeavoring into the use of advanced technologies like mobile banking for their customers. Finally, deposits money banks should maintain steadily and encouraging mobile banking in their operations because the number of people with access to a mobile hand set is increasing every day.
Keywords: Automated teller machine; Electronic banking; Internet banking; Point of sales; Return on assets

Introduction

Over the years, the drive towards attaining a continuous performance has been a major concern for both management and stakeholders of banks in Nigeria, the world over. Basically, unceasing performance is one of the prime goals of any bank since only via performance, are they able to attain sustainable growth (Gavrea, Ilies & Stegerean, 2011; Wachira, 2013; and Monyoncho, 2015). To realize the unceasing performance, every firm whether financial or non-financial explores ways to be bench -racer in fierce competitive business environment and adapt to changes (Monyoncho, 2015); this seems to be the case for deposit money banks.

Globally, deposit money banks (DMBs) have strived towards attaining improved performance by developing and adopting new products in line with technological changes known as 'electronic banking'. Electronic banking consists of internet banking, automated teller machine (ATM), mobile phone banking among others. Oluwatayo (2012) noted that electronic banking gives opportunities and allow nearly many persons without bank accounts to access financial services. Thus, with electronic banking, DMBs are able to sustain competitiveness such that they have transformed from their conventional approach of 'bricks and mortar' into a 'click and mortar' in their methods of operations (Mateka, Gogo & Omagwa, 2016).

Noteworthy is the fact that electronic banking has brought about the use of automated machine, point of sales (POS), internet banking, and the use of debit cards; no doubt, these have led to the reduction in moral hazards, reduced regulatory costs, transparency, customization, reduction in transaction costs on the part of DMBs and ease of access to DMBs services and products, which has improved financial performance in aggregate.

The term electronic banking refers to the application of information communication technologies (ICTs) to bank operations (Kabiru & Farouk, 2012). Electronic banking services have made it possible to provide new kinds of value added services for customers and other stakeholders who are users of banks services (Matevu & Kerongo, 2015). Notwithstanding the undeniable import of electronic banking in promoting DMBs performance, the impact is still misunderstood, simply for two (2) vital reasons (Ngumi, 2013). *First*, there is inadequate understanding about the drivers of electronic banking technology; and *second*, technology impact on DMBs performance remains lowly empirically tested using bank data (Ngumi, 2013).

More worrisome is the fact that most extant studies from developed and developing nations (Mwania & Muganda, 2011; Pooja & Singh, 2009) have produced mixed results regarding electronic banking and DMBs performance. The few studies in Nigeria (Oluwagbemi, Abah & Achimugu, 2011; Jegede, 2014; and Olumide, 2014) had focused on electronic banking or e-payment system in areas of either ATM, internet banking, mobile banking or e-banking in relation to bank performance via the use of primary data (i.e. questionnaire) and also analysed with descriptive statistics, chi-square and ordinary least squares regression methods. It is at the centre of the mixed findings and the methodological bottleneck that has created and necessitated the need to carry out an investigation to establish the extent to which electronic banking contributes to DMBs performance in Nigeria.
In light of the foregoing, this study employed a robust methodological approach - the use of co-integration and error correction model in analyzing quarterly secondary data of electronic banking measures (mobile banking, automated teller machine, internet

banking and point of sales) on bank performance (return on asset) from 2009-2020; thus, there lies a gap in literature in this regards, which this study fills.

Literature Review and Theoretical Framework

Bank Performance and Measures of the Study

Bank performance has been defined in various ways. Bank performance according to Harash, Al-Tamimi and Al-Timimi (2014a), is the achievement of bank objectives measured against known standards, totality and costs. Fauzi, Svensson and Rahman (2010) see bank performance as the bank's capability to achieve its goals by utilising resources in an effective and efficient way. The performance of bank arises because of the tactics bank employs to realize goals and objectives (Sacristan-Navarro, Gomez-Ansón & Cabeza-García, 2011; and Harash, et al., 2014a).

In management literature, DMBs performance is usually measured using a blend of financial ratios (Matevu & Kerongo, 2015). Owing to this, numerous measures of DMBs performance have evolved to include but not limited to operational, financial and non-financial, innovation, and quality performance (Ahmed, Francis & Zairi, 2007; Mwai, Memba & Njeru, 2018). DMBs performance via two dimensions: organizational and operational performance; however, Gavrea, et.al., (2011); and Fauzi et al., (2010) see DMBs performance in the areas of operational and financial performance.

Notwithstanding the categorization of DMBs performance can be seen in the light of financial and non-financial performance (Wachira, 2013; and Kolapo, 2012). Financial performance entails measures of market-based and accounting-based performances (e.g. stock prices, dividend pay-out and earnings per share, return on asset and return on equity, operating profit margin and net firm income, etc.) while non-financial performance entails product quality, marketing or distribution efficiency, among others. Regardless of the numerous measures of performance, this study adopts the financial performance standpoint, particularly return on asset. Return on asset measures the return on the firms' assets and is often used as an overall indicator of profitability.

Electronic Banking and Measures of the Study

The issue of electronic banking is associated with the idea of a flow – generation, application, dissemination of technologies (Matevu & Kerongo, 2015). Electronic banking is seen as the automated delivery of new and traditional banking products and services directly to customers via a labyrinth of network and interactive communication channels such as the use of computers, or mobile phones.

Electronic banking has led to vital changes in the financial sector in areas of deregulation, increased competition, higher cost of developing new product and the rapid pace of technological innovation. The services offered by electronic banking

can either be provided by the banks having physical offices and by creating a website and providing services through a virtual means. Electronic banking begins with opening of bank account, and transactional activities such as funds transfer, bill payments, loans and other transactions (Nickel, 2018). In this study, four (4) measures of electronic banking were employed to include mobile banking, automated teller machine, internet banking and point of sales.

First, mobile banking is one form of electronic banking; it is used for performing balance check, account transactions, payments, credit applications and other banking transactions via a mobile device such as a mobile phone or personal digital assistant (PDA) (Ndunga, Njati & Rukangu, 2016). Monyoncho (2015) noted that mobile banking allow customers with convenience of accessing bank products and services via their phones. Thus, mobile banking is about getting banking services and products to the unbanked (those who do not have physical access to bank.

Second, automated teller machine allows bank customers to conduct banking transactions from almost every other ATM machine in the world. The basic form of non-branch banking is ATM, where bank customers' access bank services and products with their card and pin and check their balances, withdraw monies, and make payments. Ogbuji. (2012) observed the ATM is one of the existing replacements of the cascading labour intensive transaction system done through what is popularly known as paper-based payment instruments. Jegede (2014) showed that the use of ATM terminals have averagely improved the performance of Nigerian DMBs.

Third, internet banking offers bank customers with home banking services and products. Internet banking refers to banking services provided by banks over the internet. Some of the vital internet banking services includes paying of bills, funds transfers, viewing account statements, among others. Internet banking is performed via a computer system or similar devices that can connect to the banking site via the internet (Oruro & Ndungu, 2013).

Fourth, point of sales (POS) is another aspect of electronic banking. Ngumi (2013) sees POS as a retail payment system which reads a customer's bank's name and account number when a bank card or credit card is swiped (passed through a magnetic stripe reader). The use of POS has made bank services more accessible by customers', cost efficient and income generating streams for DMBs (Iftekhar, Schmiedel & Song, 2009; and Ngumi, 2013).

Theoretical Framework

This study is anchored on the Technology Acceptance Theory (TAT) originally developed by Davies (1986). TAT proposes the connection between users' acceptance of any innovation and the users' perceived ease of usefulness of such a technology (Mulwa, 2017; and Monyoncho, 2015). TAT deals with perceptions as opposed to real usage, and suggests that users are the key factors that influence how, where and when they will use such technology.

TAT proposes two frameworks - perceived usefulness which according to Davis (1986), is the degree to which a user believes that using a particular system will lead to improved performance (Britton & McGonegal, 2007) while the second is the perceived ease-of-use which shows the extent to which a person believes that making use of certain technology is not cumbersome. The relevance of TAT to this current study is that it explains users' acceptance of electronic banking and usage in the context of improving organizational performance.

Methodology

This study employed ex-post facto research design. The study is based on quarterly time series data covering the period 2009-2020. The choice of periods was necessitated following the CBN disclosure of electronic banking data in the statistical bulletin. A total of twenty-one (21) banks in Nigeria constituted the population of the study and hence the study sample. Specifically, the study population cuts across DMBs with international, national and regional coverage in Nigeria.

The data of the study comprised of electronic banking measures of mobile banking, POS, ATM and internet banking while performance measure comprised of return on asset, which were obtained from the CBN statistical bulletin. Data obtained were analyzed using both descriptive (mean, maximum,, minimum, standard deviation, skewness, kurtosis, and Jacque-Bera test) and inferential (Pearson correlation, Variance Inflation Factor, Breusch Pagan Godfrey, unit root, co-integration and error correction model) statistical techniques. Our model specification was adapted from Dinh *et.al,*(2015) who proposed a three variable linear regression model to assess the relationship between electronic banking and operational efficiency of Vietnamese DMBs as specified as below:

Performance

$$_{it}=\sum_{k=1}^{4} \beta j * \mathrm{MULTI}_{it}^{j} + \sum_{k=0}^{n} \delta * \mathrm{X}_{i=t-1}^{k} + \sum_{t=1}^{n} \emptyset + \mathrm{timedump}\ t + \in it$$

Where: $_{i,t}$ are bank index and time of observation, respectively) $\mathrm{Performance}_{i,t}$ is the indicator of the operational efficiency of the bank i at time t, including the profitability ratio (ROE, ROA), operating costs (NIE/A), non-interest income (NONII/A); $\mathrm{X}_{i=t-1}^{k}$ Consists of 3 variables controlling the performance indicators of the bank i at time t: ln(A) (asset size); Deposit/A (deposits / total assets ratio), Loan/A (loans / total assets

ratio). $MULTI_{it}^{j}$ includes 3 dummy variables which represent the time period when commercial banks started to transact on internet banking to year t: MULTI1 (new internet banking when put into use), MULTI3 MULTI4 (impact of internet banking with latency 3 years and more than 4 years). For the purpose of this study, our model is specified in both implicit and explicit forms:

$$ROA = f(MB, ATM, INET, POS). \quad \text{Eq. 1}$$

$$ROA_{it} = \beta_0 + \beta_1 MB_t + \beta_2 ATM_t + \beta_3 INET_t + \beta_4 POS_t + + \mu \quad \text{Eq. 2}$$

Where: ROA=Return on asset proxy for bank financial performance (dependent variable); $\aleph_0$ = Constant or intercept; β_1, to β_4 = Coefficients or parameters of the proposed estimates; t = for time; MB= mobile banking (explanatory variables - ATM= Automated teller machine; INET= Internet Banking; POS= Point of sales)

Table 1: Operationalisation of Variables and A-Priori Expectations

S/N	Variables	Notation and Measurement	Apriori Sign
	Dependent Variable		
1	ROA	Bank financial performance will be proxied with: ROA which is return on asset is measured as profit before tax divided by total asset	
	Independent Variables		
2	MB	Mobile banking is measured in this study as the total value of mobile banking transactions in a particular year respectively	+
3	ATM	Automated teller Machine is measured as the total value of ATM transactions in a particular year respectively	+
4	INET	Internet banking is measured as the total value of mobile banking transactions in a particular year respectively	+
5	POS	Point of sale is measured as the total value of POS transactions in a particular year respectively	+

Source: Researchers' Compilation, 2021

RESULTS AND DISCUSSIONS

Table 2: Descriptive Statistics

	ROA	MB	ATM	INET	POS
Mean	2.883000	116.9482	821.9903	35.15450	139.4075
Median	2.420000	61.72000	798.7050	20.47500	64.05500
Maximum	8.900000	592.9400	1832.550	340.3900	714.3500
Minimum	0.090000	0.060000	62.59000	3.370000	1.870000
Std. Dev.	1.922052	149.5240	540.4654	60.83085	190.9486
Skewness	1.678782	1.487693	0.234506	3.989112	1.614326
Kurtosis	6.170952	4.611240	1.847507	19.00975	4.637137
Jarque-Bera	35.54694	19.08170	2.580352	53.32736	21.84069
Probability	0.000000	0.000072	0.275222	0.000000	0.000018
Observations	40	40	40	40	40

Source: Researchers' Computation, 2021

The descriptive statistics in Table 2 showed that return on asset (ROA) had a mean value of 2.8830(3%) with maximum and minimum values of 8.9000(9%) and 0.0900 respectively coupled with the moderately high standard deviation, signified that in average DMBs in Nigeria achieved low rate of financial performance using electronic banking. Besides, the table showed DMBs performance with positive skewness value of 1.6788, an indication that its curve skewed towards right hand side, and kurtosis value of 6.1710 signified that the curve is positively peaked at leptokurtic level, suggesting that it is moving above normal distribution, while Jarque-Bera value of 35.5469 at probability value of 0.0.000 (less than 5% significance level), implied that the data for the result not normally distributed.

Similarly, mobile banking had maximum and minimum values of ₦592.94 billion and ₦0.060 billion with mean value of ₦116.95billion; this implies that mobile banking introduction has attracted reasonable amount for DMBs in Nigeria from absolute volume of transactions. Mobile banking with positive skewness and kurtosis values of 1.4877 and 4.6112 respectively, coupled with Jacque-Bera value of 19.0817 at probability value of 0.0001 (less than 5% significance level), indicates that mobile banking is not normally distributed. Automated teller machine (ATM) had mean value of ₦821.99 billion, with a maximum of ₦1832.55 billion and a minimum of ₦ 62.59 billion respectively; this signifies that the use of ATM has been realized by DMBs from absolute volume of ATM transactions. The skewness and kurtosis values of 0.2345 unit (skewed right hand side) and 1.8475 units (peaked at Platykurtic level since it is less than benchmark of 3units - Mersokurtic), with Jarque Bera value of 2.5804 at probability value of 0.2752 (27%), which is greater than the significance level of 5%, suggests that ATM is normally distributed.

Furthermore, internet banking (INET) with a mean value of ₦ 35.155 billion, maximum value of ₦340.39 billion and minimum value of ₦3.989 billion, indicated that DMBs in Nigeria have realized certain amount from absolute volume of internet banking. Internet banking showed a positive skewness value of 3.9891 and skewed to

right hand side; kurtosis value of 19.0010 units showed that its graph is caved at leptokurtosis; and Jarque-Bera value of 53.3274 units at probability value of 0.000(0) which is less than 5% significance level, show that internet banking is not normally distributed. More so, point of sale (POS) had mean value of ₦139.41 billion, maximum value of ₦ 714.350 billion and minimum of ₦ 1.8700 billion; an indication that on the average, DMBs in Nigeria realized amount of money from volume of transactions. Meanwhile, POS had positive skewness value of 1.6143 units and positive kurtosis value of 4.6371 (carved at leptokurtic level) and Jarque-Bera value of 21.8407 units at probability value of 0.0000 which is less than 0.05 (5%) significance level indicated that the result is not normally distributed.

Table 3: Pearson Correlations

Variables	ROA	MB	ATM	INET	POS
ROA	1.000000				
B	0.305314	1.000000			
ATM	0.513533	0.883702	1.000000		
INET	0.116626	0.771821	0.516160	1.000000	
POS	-0.278370	0.887875	0.860684	0.779386	1.000000

Source: Researchers' Computation, 2021

The correlation coefficient (r), between the dependent variable (return on asset (ROA)) which is the proxy for bank performance and the independent variables (MB, r=0.3053; ATM, r=0.5135; INT, r=,0.1166) were positively correlated with DMBs performance. While POS r=-0.2784 was negatively correlated with DMBs performance. It is deduced that the highest is between mobile banking (MB) and point of sale (POS) with very high positive correlation coefficient value of 0.8879. impliedly, the results showed that the strength of correlations between most variables are high hence produced small effect of approximately (±.1166) while association between other variables produced moderate effect (±.5135) and high effect (±.8879) respectively. Furthermore, the correlation coefficients are relatively high, but the associations indicate absence of the problem of multicollinearity in the pairs of independent variables. To further confirm this, we performed a diagnostic test - Variance Inflation Factor (VIF).

Table 4: Test of Variance Inflation Factor

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	0.391793	6.193749	NA
MB	0.000159	8.943543	5.495522
ATM	1.48E-06	2.251790	6.677059
INET	6.35E-05	4.860978	3.620736
POS	7.67E-05	6.665530	4.309567

Source: Researchers' Computation, 2021

The result revealed a relatively low-centered VIF of 5.4955 for mobile banking (MB); 6.6771 for automated teller machine (ATM); 3.6207 for internet banking (INET) and 4.3096 for point of sale (POS). The results of the VIF showed the absence of multicollinearity in the variables since none of the values exceeded the threshold of 10 units as suggested by Hair, Black, Babin and Anderson (2010).

Table 5: Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.655957	Prob. F(2,33)	0.4535
Obs*R-squared	1.76674	Prob. Chi-Square(2)	0.3676

Source: Researchers' Computation, 2021

The test reported F-statistic of 0.6560 and at probability value of 0.4535; the result is statistically insignificant, which by implication suggest no evidence of the presence of serial correlation in the model of electronic banking and DMBs performance.

Table 6: ADF Unit Roots Result

Series	Level	1st Difference	Critical Value 5%	Integration
ROA	-4.307647*	-9.076678*	-2.951125	I (1)
MB	-1.571501	-5.810599*	-2.951125	I (1) CME
ATM	-2.368662	-5.454654*	-2.951125	I (1) AC
INET	-0.649114	-4.365963*	-2.951125	I (1) FPI
POS	-1.784586	-3.860889*	-2.951125	I (1) HB

Source: Researchers' Computation, 2021;

Note *&** indicate the critical values at 1% and 5% level respectively. The critical value at 1% & 5% are -3.639407 and -2.951125 respectively.

Table 6, it can be deduced that return on asset (ROA) with value of -4.3076 ADF at level was higher than critical values of 2.9511 (5%) suggesting the presence of stationarity. The respective values of money banking (MB)), automated teller machine (ATM), internet (INET), and point of sales (POS) probability values were greater than 5 percent critical values at the levels series, but were less than the critical value at 5%

for the differenced series. The implication is that the time series were non-stationary in their levels but later stationary at first difference. Box and Jenkins (1978) noted that non stationarity time series in levels, be made stationary by taking their first differences.

This further suggested that, the variables were time-dependent and would not guarantee a long run relationship unless tested. Thus, the variables are integrated of order one (i.e. 1[1]). It is deduced that the ADF test statistic for each of the variables at first difference are greater than the 95% critical ADF values (in absolute terms) which is adjudged to be stationary.

Table 8: Co-Integration Residual Based (unit roots)Test

Series	ADF Level	PP Level	Integration
Residual	-3.8677**	-60.152*	I (1)
1 percent critical value = -4.1420.		5 percent critical level = -3.4969	

Source: Researchers' Computation, 2021;

Note * & ** indicate the critical values at 1 percent and 5 percent respectively. The critical values at 1 percent and 5 percent are -4.1448 and -3.4987 respectively.

Table 8 indicated that the variables in the model has a long-run relationships or co-integrated since the Augmented Dickey-Fuller (ADF) statistics are greater than critical values at 5 percent (5%) and 1 percent (1%) level respectively. Thus, we cannot reject the hypothesis of co-integration among the variables. As can be observed from the Table 8, the statistics indicated long run relationships among the series and that the variables are moving together in time. The diagnostic tests conducted earlier produced results to show that the variables under study possess desirable empirical characteristics that qualify them to be included in Error Correction Model (ECM).

Table 9: Parsimonious Result of Error Correction Model

Variable	Coefficient	Std. Error	t- Statistics	Prob.
C	-0.004810	0.078815	-0.061030	0.9519
D(MB)	2.760259	0.859093	3.212994	0.0039
D(ATM)	3.006796	0.702804	4.278285	0.0002
D(INET)	0.003910	0.015239	0.256569	0.7998
D(POS)	-0.196327	0.091307	-2.150193	0.0423
ECM(-1)	-0.836597	0.168876	-4.953924	0.0001
R^2 = 0.6386 **Adjusted R^2** = 0.5286 **F- Stat (Prob.) =5.8056 (**0.00058) **DW** = 1.6681				

Source: Researchers' Computation, 2021

The error correction model (ECM) least square result reported a coefficient of determination R-squared (R^2) value of 0.6386 with return on asset (ROA) being the proxy for bank financial performance, signified that 64% of the systematic variations in the dependent variable being bank financial performance (return on asset, ROA)

was accounted for by the explanatory variables of mobile banking (MB), automated teller machine (ATM), internet banking (INET) and point of sale (POS) While about 36% were unaccounted for, hence captured by the error terms. After adjusting the degree of freedom, adjusted coefficient of determination (adjusted R-square bar (R^2) which indicates 0.5286 with ROA, showed that approximately 53% of the changes in the bank financial performance which was proxied by return on asset (ROA) were explained by the independent variables of bank technological changes (mobile banking (MB), automated teller machine (ATM), internet banking (INET) and point of sale (POS), while, 47% of the variations were unexplained, hence captured by stochastic disturbance.

The F- Stat (Prob.) of 0.00058 indicates that there is a simultaneous linear relationship between the dependent variable and all the explanatory variables combined. This suggests that the joint effects of all the included variables in the model are significant in explaining bank financial performance in Nigeria. The Durbin Watson (D-W) statistic values for the equation of 1.6682 is sufficiently and approximately to be 2. Thus, there is the absence of a first order position autocorrelation in the model. The coefficient of ECM is statistically significant at 1 percent level and correctly signed. From the result, ECM coefficient indicated negative value of 0.8366. This suggested that about 84 percent of the disequilibrium in the model will be corrected every year. Interestingly, the overall model is highly significant and shows a high goodness of fit even at the 1 percent level.

Furthermore, three of the variables (DMB, DATM and DPOS) in the model were statistically significant with DMBs performance at the 5% level, except only variable DINET which passed the t-test at 79% level (statistically insignificant). That means internet banking is a weak determinant of bank financial performance substituted with (ROA). Since results in Table 4.8 showed a robust linear relationship between the variables, thus, the estimates were impressive, reliable for structural analysis and policy directions. The parsimonious result of error correction model was used to assess the effect of electronic banking measures on DMBs performance.

First, the mobile banking coefficient (β_1) is 2.7603; the coefficient is significantly different from zero, implying that a unit change in mobile banking would definitely increase patient flow by 2.7603 units. The t-statistic value is 3.2130 and the probability value is less than critical value of 5% significant level. The outcome of the test indicates that mobile banking is statistically significant. The finding is consistent with the viewpoints of Ngumi (2013), who found that mobile banking had a higher moderating effect than any bank technology or innovations when influencing financial performance of commercial banks. Lee, et al., (2007) showed that mobile banking presents an opportunity for financial institutions to extend banking services to new customers thereby increasing their market and performance.

Second, the positive coefficient (β_2) value of automated teller machine of 3.0068 unit, was significantly different from zero and this implied that a unit change in ATM will definitely increase bank financial performance by 3.0068 units. The t-statistic value is 4.2783 and the probability value is less than critical value of 5% significant level. The outcome of the test indicates that automated teller machine (ATM) is statistically significant. The finding conforms to apriori expectation that as more ATM are installed, the more likelihood to influence bank performance. The inference of this test is that ATM has a significant influence on DMBs performance in Nigeria. The finding is consistent with plethora of studies such as Kabiru and Farouk (2012); Jegede (2014); Olumide (2014); Monyoncho (2015); and Mwai, et al., (2018) who found that number of ATMs had a significant impact on DMBs performance in Nigeria.

Third, internet banking (INET) indicated positive coefficient (Υ_3) value of 0.00491. This showed that internet banking in relation to DMBs performance (return on asset) equation is slightly different from zero, indicating that a unit increase in internet banking could affect DMBs performance by 0.00491. The value of internet banking (INET) of t-statistic was 0.2566 and associated probability value of 0.7998. The t-statistics probability value in the estimates is higher than the critical value at the 5 percent (5%) significant level. Thus, this shows that internet banking is significantly low and that usage of internet banking is a weak factor having effect on DMBs performance. The finding agrees with the extant study of Mateka, et.al., (2016) who found that internet banking has positive influence on bank performance.

Fourth, point of sale (POS) indicated negative coefficient value with DMBs performance (ROA); impliedly, a unit increase in point of sales (POS) could negatively affect DMBs performance by -0.1963 units. The t-statistic was 2.1502 with probability value less than critical probability value of 5%. The result showed that point of sale is statistically significant. The findings conform to a priori expectation. The inference of this test is that point of sale (POS) has significant influence on DMBs performance in Nigeria. Nader (2011) study disagrees with our results indicating that point of sales do not improve DMBs performance and efficiency.

Conclusion and Recommendations

Results of the study showed that mobile banking, automated teller machine and point of sales were statistically significant, suggesting that they are critical or strong technological changes factors enhancing financial performance of banks in Nigeria. Similarly, internet banking was found to be statistically insignificant with DMBs performance, implying that they are weak factor enhancing DMBs performance in Nigeria. In effect, the study concludes that electronic banking has effect on DMBs performance in Nigeria. Given the findings of the study, it was recommended that:

(i) Banks should encourage their customers to key into their mobile banking ideology. Bank should be able to determine the technical background of the majority of its customers before endeavoring into the use of advanced technologies like mobile banking for their customers.

(ii) Automated teller machines should be located in major streets junctions in towns and cities. Also, automated teller machine should be cited in all the local government areas or rural areas in the country so as to ease banking transactions at reduced cost and to prevent the risk of carrying cash at long distance by customers of banks.

(iii) Banking institutions should considered intensifying the internet banking as this will ensure services accessibility by customers and thus improving financial performance. Also, banks should ensure that adequate internet securities are acquired to protect customers' accounts especially those using internet banking.

(iv) Banks should issue point of sale (POS) to all their customers especially those in different form of businesses so as to encourage cashless policy of the Central bank of Nigeria. Banks should closely monitor their customers' with POS or debit cards and track their transactions in case of fraudulent persons have access to it.

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