

EFFECT OF FINANCIAL INNOVATIONS ON FINANCIAL PERFORMANCE OF DEPOSIT MONEY BANKS IN NIGERIA

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Abstract

This study examined the effect of financial innovations on the financial performance of A Deposit Money Banks (DMBs) in Nigeria. Descriptive research design was employed in the study. The population of the study comprised of all the twenty-two DMBs in Nigeria as at 30th June, 2021. Fourteen (14) banks were selected using a simple random sampling technique. Secondary Data was collected from the annual report and accounts of the sampled Banks for the period of five years (2016-2021). Panel regression technique was used to analyze the data. The financial performance of these banks was measured in terms of Return on Equity (ROE) and Earnings per Share (EPS). And the financial products and services were proxied by Mobile Banking (MB) and Automated Teller Machine (ATM). The study found that MB has a negative effect on ROE and ATM has a positive effect on EPS. The study concludes that financial innovations affect the financial performance of DMBs in Nigeria. It is therefore recommended that banks continue to promote the use of MB and ATM as they have the potential of improving performance and reasonable fee to be charged on transactions that will benefit both the banks and customers.

Key words: Financial Innovation, Deposit Money Bank.

Introduction

The Nigerian Banking sector has experienced tremendous dynamism over time. Financial institutions operate in heavily regulated environment and highly volatile environment (Quiunn and Connolly, 2017). The environment is facing continuous changes, hyper competition, changing demographic and customer needs that demand adoption of counter strategies in order to perform better and survive (Quiunn and Connolly, 2017), (Kiiyuru, 2016) and (Al-Ansan, Pervand and Zu, 2013). Financial innovation emerged as one of the most important tools used by Deposit Money Banks (DMBs) due to international time based competition. Financial innovation may cause creative destructions where the creation of new product, service and production methods simultaneously destroy the monopoly market position of firms committed to existing product and old ways of doing business.

Frame and White (2016) and Joannan (2019) define financial innovations as changes in the functioning and the new solutions and developments in financial markets, financial institutions, financial instruments and regulations connected with their activity. According to the broad approach, the financial innovations include any new developments in any elements of the financial system (markets, institutions, instruments and regulations). Financial performance measures how well a firm is generating value for the owners. It can be measured through various financial measures such as profit after tax, return on net asset (ROA), and return on equity (ROE), earning per share (EPS) and any market value ratio that is generally accepted. Performance of banks has been measured using a combination of financial ratios analysis, benchmarking, measuring performance against budget (Ahmed, 2016).

These financial innovations are seen as contributing to the financial performance of firms. Financial performance measures how well a firm is generating value for the owners. Schumpeter (1934) in Kiiyuru (2016) opines that the successful introduction of products, processes, as well as, organizational innovations, enables firms to supersede the existing industries, as well as, markets. These companies finally grow to attain a significant market share greater than the less innovative firms. Examples of product innovations are Eco bank's Xpress accounts, Retail Internet Banking (RIB), Masterpass Quick Response, Mvisa, Mobile money etc. The first bank rolled out first mobile Banking services tailored to meet specific status groups such as Premier, Advantage, Classic and Youth banking by Eco bank Nigeria Limited.

Other examples include Real Time Gross Settlement (RTGS) which is a funds transfer mechanism where transfer of money takes place from one bank to another in real-time. This means transactions are processed as they are received without batching them first before processing, thus resulting in quick settlement of large payments (Margaret, 2015). Online banking has enabled customers to originate payments and monitor their accounts.

Although a significant number of studies in the field of financial innovations are available, most of the studies have concentrated on financial products in developed countries (Frame and White, 2016; Lerner and Tufano, 2016; Jose, Lanchester and Stevens, 2019). The implications of this state are that managerial actions and government policies such as the Nigerian Cashless policy may not be guided by reliable and sufficient research. In view of this, the researcher opines that the existing knowledge on financial innovation does not adequately represent Nigeria's financial innovation context. It is at the center of the mixed conclusions and the quest or aim to carry out a study on the effect of the financial innovations on the performance of DMBs in Nigeria that necessitates the study. Nkem and Akujinma (2017), in their study of financial innovation and bank efficiency in Nigeria. Use secondary data covering the period of eight years the data was sourced from CBN statistical bulletin. A multiple regression model was developed and estimated to evaluate the relationship among the variables concerned. The finding reveals that the value of transaction on (ATM) and (POS) are negatively related with efficiency ratio while web/internet and mobile banking are positively related but only that of web/internet was significantly related.

Shehu, Aliyu and Musa (2019) study the effects of electronic banking products on performance of Nigerian DMBs. The population of the study were twenty-one (DMBs) and six (6) banks were selected as the sample of the study. Data was source from the annual report and accounts of the sampled Banks. The performance of these banks were measured in terms of returns on equity (ROE). The study revealed that the adoption e-mobile and ATM transactions has significantly impacted on the performance while e-direct and SMS alert have not significantly impacted on the performance of the banks.

Oginni, Mohammed, El-maude and Abam (2018), carry out a study on e-banking and bank performance in Nigeria.

Panel data from annual report of eight banks that have adopted e-banking between 2000 and 2010. The impact of e-banking on return on asset (ROA), return on equity (ROE) and net interest margin (NIM). Result from pooled OLS estimations indicate that e-banking begins to contribute positively to bank performance in terms of ROA and NIM with a time lag of two years while a negative impact was observed in the first year of adoption. This study intends to take a departure from past studies and incorporate several innovations and their effect on multiple bank performance indicators using secondary data from annual report of the banks. There is also concentration of innovation-performance studied on profitability only and mostly in developed countries leaving a paucity of innovation performance literature for Africa and Nigeria specifically. This literature gap is intended to be addressed by this comprehensive study.

Theoretical Review

Aguilar (2019) noted that a theoretical framework is fundamental in a study for the purpose of identification of the variables to be evaluated in a particular study. According to Dawson (2016) and White (2016) poses that a theory is the basis of generalization of a phenomenon. Thus it is true to suffice that theories helps in making general observations about things. This study will be based on the following theories:

The Blue Ocean Theory, a concept outlined by Kim and Mauborgne (2015) and William (2015) who argues that companies can succeed not by battling competitors, but rather by creating "blue oceans" of uncontested market space. In blue oceans, competition is not relevant and there is ample opportunity for growth that is both rapid and profitable.

Technology Acceptance Model (TAM): Theories and models used in studies related to the innovations, acceptance and use of new technology are many. For instance, focusing on the technological issues. Davis (1989) in Kim and Mauborgne (2015) advances the TAM model. This study therefore, provides answers to the following questions:

Research Questions

1. What effect does mobile banking has on financial performance of DMBs in Nigeria?
2. What effect does automated teller machine has on financial performance of DMBs in Nigeria?

This paper is also guided by the following null hypotheses:

Hypotheses of the Study

H₀₁: Mobile banking does not have significant effect on financial performance of DMBs in Nigeria

H₀₂: Automated teller machine does not have significant effect on financial performance of DMBs in Nigeria

Methodology

Descriptive research design was employed in the study. A Descriptive study tries to identify an accurate profile of a situation. The population of the study comprised all the (DMBs) in Nigeria as at 2021. Fourteen (14) banks were selected using a simple random sampling technique. Secondary Data was collected from the annual report for the period of five years (2016-2021). The period of the study was selected because it was the period the banking industry witness the deployment of various innovative products and services. The study applied panel regression with a chosen random effect model as validated by Hausman test.

Variables Measured

The variables measured in this study are Independent Variable (IV) Financial Innovation, proxied on Mobile Banking (MB) and Automatic Teller Machine (ATM). While the Dependent Variable (DV) Financial Performance was proxied on Return on Equity (ROE) and the Earning per Share (EPS).

The actual procedure for determining the DMBs financial innovation was done by considering the new fixed assets (MB and ATM) as a percentage of fixed total assets. While, the DV for the DMBs was calculated for ROE as net profit margin multiplied by asset turn over multiplied by equity. For EPS, it was done by comparing the DMBs' profits divided by the outstanding shares of their common stock, which the result served as the EPS ratio. All the procedures are grounded or supported in the literature reviewed as can be particularly observed in Ahmed (2016), Richard (2019) and Moussu and Petit-Romee (2020).

Empirical Model specifications

The empirical model to be used in the study to test the effect of financial innovation and financial performance of DMBs is presented as follows:

This study adapted the general form of panel data models as use by Nkem & Akujinma (2017) and is specified below as:

$$Y = \beta_0 + \beta_1 X_{it} + \beta_2 X_{it} + \dots + \beta_k X_k + \varepsilon \dots \dots \dots (1)$$

To achieve our objective, we specify the following empirical model:

$$ROA_{it} = \beta_0 + \beta_2 MB_{it} + \beta_3 ATM_{it} + \beta_4 BS_{it} + \varepsilon_{it} \dots \dots \dots (2)$$

$$ROE_{it} = \beta_0 + \beta_2 MB_{it} + \beta_3 ATM_{it} + \beta_4 BS_{it} + \varepsilon_{it} \dots \dots \dots (3)$$

Where:

ROE_{it} = return on equity for bank j in year t

EPS_{it} = earnings per share for banks j in year t

MB_{it} = mobile banking

ATM_{it} = Automatic Teller Machine

BS_{it} = bank size

Decision rule, null hypothesis is rejected if the prob (p-value) is < 5% significant level, otherwise is accepted.

Results Presentation and Discussions

Descriptive Statistics Results

The descriptive statistics contains the mean, standard deviations, minimum and maximum values of the DVs & IVs as in Table 4.1.

Table 4.1: Descriptive Statistics

Variables	Obs	Mean	Std. Dev.	Minimum	Maximum
ROE	70	11.889	12.204	0.04	73.3
EPS	70	161.885	170.226	1	816
MB	70	8.824	8.671	0.19	41.8
ATM	70	8.760	10.591	0.12	51.6
BS	70	16.422	12.328	0.52	73.3

Source: Authors' computation using STATA 16.0 version.

The results presented in Table 4.1 shows that the average value of ROE is approximately 12% with a standard deviation of 13% while 0.04 and 73.3 are the MIN. and MAX. Values respectively. EPS mean is approximately 162 kobo, with a standard deviation of 170 kobo, while the minimum and maximum values stood at 1 kobo and 816 kobo respectively this implies that EPS increases by 10k as a result of increased income from financial innovations. Table 4.1 indicates further that the mean value of Mobile Banking (MB) is 8.824286 percent, with a standard deviation of 8.671365, while the minimum and maximum values stood at 0.19 and 41.8 respectively.

It was also reported that Automated Teller Machine (ATM) mean stood at 8.760571 percent, with standard deviation of 10.59111, while having 0.12 and 51.6 as its respective minimum and maximum values. In addition, the mean of Bank Size (BS) is 16.42229, with a standard deviation of 12.32889, While 0.52 and 73.3 are the minimum and maximum values respectively. In summary, the data presented revealed that all the variable's mean are positive. This situation indicates a gradual process of effective financial innovations with positive effects on the financial performance of deposits money banks (DMBs) in Nigeria.

Interpretation of Random Effect Test Result on Model one

This section presents the interpretation of the random effect model result showing the effect of financial innovations on the financial performance of Deposits Money Banks (DMBs) in Nigeria. This was done using return on equity as a proxy for financial performance, as indicated in model two as the accepted model after performing Hausman test. The result of a random effect on model two is presented in Table 4.2.

Table 4.2: Random Effect Result Model one

Dependent Variable: Return on Equity (ROE)		
Independent Variables	Coefficient	Z-ratio
Mobile Banking (MB)	-0.1014599	-2.21***
Automated Teller Machine (ATM)	-0.0522553	-0.45
Bank Size (BS)	0.3957674	4.00***
Wald Chi2	17.19***	
Diagnostic Tests		
Multicollinearity Test (VIF)	1.29	
Heteroskedasticity Test (White's Test)	16.82	(0.2657)

Source: Authors' computation using STATA 16.0 version

This denotes level of significance at 1%, 5% and 10% respectively. The values in the parentheses are the P-values. Looking at the random effect model two result in Table 4.2, it shows that Wald Chi-square of 17.19 which appears to be significant at 1% level is adequate for prediction. It further describes the joint influence of the dependent (ROE) and the independent variables (MB, ATM and BS) combined. It further shows Mobile Banking coefficient of -0.1014599, indicating a negative significant effect on return on equity at 1% level.

Finally, as evidenced from the diagnostic tests multicollinearity (VIF) test is 1.29 of total not less than 1 and also not greater than 10. As stated that when the VIF is above 1 and not greater than 10, is not a cause of worry for multicollinearity problem. The White's Heteroskedasticity test having a probability value greater than 5% which lead to the acceptance of homoskedasticity of no variance problem in the model. Hence, there is no evidence of diagnostic problem in our model two.

Interpretation of Correlation Test Result on Model one

The correlation result is presented in Table 4.3 to explain the influence of the financial innovations on Bank performance. This is carried out in other to know the nature of relationship among the variables under study.

Table 4.3: Correlation Result Model one

Regressors	ROE	MB	ATM	BS
ROE	1.0000			
ONB	-0.0754 (0.5349)			
MB	0.2167 (0.0018)***	1.0000		
ATM	0.0090 (0.9408)	0.0108 (0.9291)	1.0000	
BS	0.5402 (0.0000)***	0.3389 (0.0041)***	0.0978 (0.4207)	1.0000

Source: Authors' computation using STATA 16.0 version.

This denotes level of significance at 1%, 5% and 10% respectively. The values in the Parentheses are the p-values. From Table 4.3 Mobile Banking has positive correlation and statistically significant on Return on Equity at 1% level income from MB will increase the performance of the banks.

Table 4.4: Hausman Test Result Model Two

Regressors EPS	Coefficients		(b-B) Difference	S.E
	(b) Random	(B) Fixed		
MB	2.1669	2.4004	-0.2335	0.4388
ATM	-1.0181	-0.8833	-0.1347	0.4027
BS	-0.6648	-0.5810	-0.0837	0.3059
Chi ²	0.93	(0.9197)		

Source: Authors' computation using STATA 16.0 version.

From Table 4.4 it shows the Hausman Chisquare test value of 0.93 with pro-value of 0.9197 greater than 5% and not statistically significant, it indicates that random effect model is appropriate for prediction and estimation.

Interpretation of Random Effect Test Result on Model Two (Test of Hypotheses)

This section presents the interpretation of the random effect model result showing the effect of financial innovations on the financial performance of Deposits Money Banks (DMBs) in Nigeria. This was done by using Earnings per Share as a proxy for financial performance, as indicated in model three as the accepted model after performing Hausman test. The result of the random effect on model three is presented in Table 4.5.

Table 4.5: Random Effect Result Model Two

Dependent Variable: Earnings per Share (EPS)		
Independent Variables	Coefficient	Z-ratio
Mobile Banking (MB)	2.400427	-2.97***
Automated Teller Machine (ATM)	-0.88334	-1.48
Bank Size (BS)	-0.5810452	-0.56
Wald Chi2	93.38***	
Diagnostic Tests		
Multicollinearity Test (VIF)	1.29	
Heteroskedasticity Test (White's Test)	7.54	(0.9121)

Source: Authors' computation using STATA 16.0 version.

This denotes level of significance at 1%, 5% and 10% respectively. The values in the parentheses are the P-values. As estimated from the random effect model three result in Table 4.5, it shows that Wald Chi-square of 93.38 which appears to be significant at 1% level. Shows that model is adequate for prediction. It further describes the joint influence of the dependent variable (EPS) and the independent variables (MB, ATM and BS) combined. However, the Mobile Banking coefficient of 2.400427, indicates a positive effect on Earnings per Share, this effect is statistically significant at a 1% level which is a percentage change in mobile banking, which will cause earnings per share to increase by 240%. The Coefficient of Automated Teller Machine (ATM) is -0.8833466, indicating a negative effect on Earnings per Share, but this effect is not statistically significant therefore Income from ATM will affect EPS in the long run. Bank Size (BS) coefficient is -0.5810452, showing a negative and no significant effect on earnings per share. Investment in additional assets will improve EPS of the banks. Finally, as evident from the diagnostic tests, multicollinearity (VIF) test is 1.29 of the total not less than 1 and also not greater than 10.

As stated that when the VIF is above one and not greater than 10, is not a cause of worry for multicollinearity problem. The White's Heteroskedasticity test having a probability value greater than 5% which lead to the acceptance of homoskedasticity of no variance problem in the model. Hence, there is no evidence of diagnostic problem in our model one.

Interpretation of Correlation Test Result on Model Two

The correlation result is presented in Table 4.6 to explain the great influence of the Bank performance on profitability. This is carried out by using the p-values to know the significant nature of the correlation influence.

Table 4.6: Correlation Result Model Two

Regressors	EPS	MB	ATM	BS
EPS	1.0000			
ONB	-0.2714 (0.0461)**			
MB	0.1375 (0.2563)	1.0000		
ATM	-0.0870 (0.4741)	0.0108 (0.9291)	1.0000	
BS	0.0947 (0.4354)	0.3389 (0.0041)***	0.0978 (0.4207)	1.0000

Source: Authors' computation using STATA 16.0 version.

This denotes level of significance at 1%, 5% and 10% respectively. The values in the Parentheses are the p-values. From Table 4.6, it is evidenced that Mobile Banking has a positive correlation, with earnings per share but is not statistically significant while Automated Teller Machine has significant negative correlation with earnings per share. Bank size has a positive correlation with earnings per share but is not statistically significant. The results reflect the different mix findings which were hither to discovered by other preceding studies.

Summary of Findings

The result from Table 4.3 reveals that MB has a significant negative effect on ROE of DMBs in Nigeria. Therefore we reject null hypothesis 2 which state that MB does not have a significant effect on the financial performance of DMBs in Nigeria which is in tandem with Ahmed (2016) and Margaret (2015). The result in Table 4.5 shows that ATM has a significant positive effect on EPS of DMBs in Nigeria.

This provides evidence of rejecting the null hypothesis 3 of the study which states that the Automated Teller Machine does not have a significant effect on the financial performance of DMBs in Nigeria. This concurs with Richard (2019) and Al-Ansari and Xu (2016).

Conclusion and recommendation

Traditionally, the most widespread method of conducting banking transactions has been through offline retail banking. Wireless technology, however, is rapidly changing the way personal financial services are designed and delivered. With the increased use of mobile phones in Nigeria, the banking sector has introduced and diffused mobile banking systems throughout their operations to improve their operations as well as to reduce costs. Based on our findings, the study concludes that online banking transactions help to improve the return on assets and equity of DMBs in Nigeria. Mobile banking transactions result in a greater return on earning par shares of DMBs in Nigeria.

The findings confirm that an increase in the innovation level results to increased financial performance. In line with the major findings, we recommend that Deposit Money Banks should continue improving and promoting online banking platform to their existing and

prospective customers as it improves their Return on Assets and equity. Deposit Money Banks should educate their customers on the conveniences and ease of using mobile banking because income from mobile banking has the potential of bringing about improved earnings to shareholders.

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