UNIVERSITY OF PORT HARCOURT JOURNAL OF ACCOUNTING AND BUSINESS
DEPARTMENT OF ACCOUNTING
UNIVERSITY OF PORT HARCOURT, CHOBA
PORT HARCOURT, RIVERS STATE
NIGERIA
VOL. 9 NO. 1 MARCH 2022

IMPACT OF FINANCIAL TECHNOLOGY ON THE GROWTH OF DEPOSIT MONEY BANKS IN NIGERIA

Akinyede, Oyinlola Morounfoluwa (Ph.D.)
Department of Banking and Finance,
Redeemer's University,
Ede Osun State, Nigeria.

ABSTRACT

This study evaluated the effects of investing in financial technology and software on the profitability of deposit money banks in Nigeria. The study focused on the impact of software development and maintenance on bank's profitability (deposit growth).. The findings indicate that the sampled DMBs are investing in software technology for improvement in their banking operations. The study therefore recommends that DMBs should be commended for the efforts put in for investment in software technology. In conclusion, using up-to-date technology in banking can help enhance customer service and operational efficiency. Banks should adopt relevant Information Technology policies that would ensure the security and protection of their customer's data as well as safeguarding their investments.

KEY WORDS: Software, Profitability, Deposit Growth, Development.

INTRODUCTION

Business environment is incredibly dynamic and full of competition due to technological advances in the 21st century. Banks, which hold a major role in sustaining an economy and assist governments in controlling the economy, must have viable technological systems. Failure to adopt efficient and effective computer technology and software could lead to bank bankruptcies, decreasing public trust in the bank, and a reduced ability to manage assets and liabilities. These factors can then culminate in lower deposit growth and decreased cost-efficiency leading to losses.

There is an imminent and unavoidable increase in the demand for information and communication technology (ICT) in the banking sector in the world at large and Nigeria is not an exemption. The use of Information technology in banking operations usually referred to as electronic (e) – banking which work through Financial technology has now been recognized as the life wire of Deposit Money Banks (DMBs) as it facilitates and supports the financial and other wise performance of the sector. Invariably, the future lies in the ICT driven banking systems and services. Banks have embarked on the deployment of software through which banking products and services such as posting of customers' transaction, Automated Teller Machine (ATM), Internet Banking (IB), Mobile Banking (MB) solutions, Point of Sale (POS) terminals, Computerized Financial Accounting and Reporting,

The development has altered hand operated and traditional forms of carrying out businesses and is being substituted by the highly developed technology that is dependent on

automatism and linkage of computers and other computerized machines (Mahboub, 2018). Therefore, new delivery technologies along e-banking products like IB, MB, POS terminals and numerous ATM products are currently substituting the traditional delivery methods (Mensah 2016).

Nigeria banks like banks across the globe operate in a dynamic framework necessitated by technology and globalization. In other to remain competitive and relevant, each of the Deposit money banks in the economy adopts state of the earth technology and invest heavily in the development and maintenance of their financial technology through which customers' data are warehoused and banking operations are carried out by customers and by the bank on behave of their customers. Despite the potential benefits of ICT, it is uncertain whether the urge investment in software developed by these deposit money banks actually translates to profitability.

Therefore, this study intends to examine the effect of the investment on the development and continuous maintenance of software by deposit money banks in Nigeria on their profitability. The main objective of the study is to evaluate the impact of investment in financial technology (software) on the growth of deposit money banks in Nigeria.

LITERATURE REVIEW

Recent research has focused on the link between level of investment in technology and performance outcomes across numerous countries. Sumra, Manzoor,, Sumra, & Abbas, (2011). zin his studies on the impact of ICT investment on profitability in Pakistani banks shows ICT channels has increased competition among banks, absence of long queue, reduction in manual banking, increase in banks Mensah (2017), when examining the effect of ICT on the performance of rural banks in Ghana find out that ICT cost efficiency has a significant impact on the performance of the rural banks. Ogare (2013) among many more contributors to the study also examined the impact of e-banking on the financial performance of forty-four deposit money banks in Kenya based on a data attained from the central bank of Kenya and from audited financial statements of the deposit money banks for the period 2008 to 2012. The results showed that there is a strong and positive association between e-banking and the profitability of commercial banks in the Kenyan banking industry. This indicates that e-banking has a positive effect on the bank's profitability (BP). Thus, whether the amount of investments in ICT certainly carries actual benefits to the banks or not is still a matter of interest in academic circles (Binuyo & Aregbeshola, 2014). This is because while some postulate a positive relationship between ICT investments and performance (Shabbir, & Wisdom, 2020; Aduda, & Kingoo, 2012; Mahboub, 2018; Le, & Ngo, 2020; Ousama, Hammami, & Abdulkarim, 2020). some others contend to the contrary (Ekinci, & Poyraz, 2019; Phan, Narayan, Rahman, & Hutabarat, 2020).

The study by Nwaeze (2021) aimed to examine the influence of financial technology adoption on the performance of domestic systemically important banks in Nigeria during the period of 2015-2019. Data was gathered from the audited annual financial statements of the said banks. The use of panel regression was employed for the analysis purposes of the collected data. Results illustrated that Automated Teller Machines, Point of Sale and web-based/mobile transfer positively impacted the performance of the domestic systemically important banks in Nigeria from 2015-2019. Moreover, investments in financial technologies were observed to have a beneficial

effect on the performance of the said banks in the given period. The paper additionally presents policy recommendations and the limitations of the study. Masocha and Matiza (2017) studied the impact of E-banking on the switching behaviour of retail customers in Polokwane, South Africa. The sample size comprised of 98 people, chosen by convenience sampling technique. Utilizing the Cronbach alpha test, it was determined that demographic characteristics play a major role in influencing the bank switching behaviour, along with factors such as bank charges, low interest rates, promotion activities, location and switching costs. Their findings suggest that customers are increasingly choosing to switch banks as a result of these factors being unsatisfactory.

More so, most researchers in examining the effect of investment in ICT on profitability of Deposit Money Banks have focused on measuring the impact of investment in ICT in general on Automated Teller Machine (ATM), Internet Banking (IB), Mobile Banking (MB) solutions, Point of Sale (POS), Unstructured Supplementary Service Data (USSD) etc. In the study of Jordanian banks in the 2003-2007 period, Karim and Hamdan (2010) found that information technology (IT) had a positive effect on the market value added (MVA), earnings per share (EPS), ROA, and net profit margin (NPM). However, IT did not have any effect on the ROE. Ultimately, the study concluded that the usage of IT can positively influence the performance of banks in terms of MVA, EPS, ROA, and NPM. Moreover, Leckey (2011) attempt to determine and document the extent to which investment in IT by banks in Ghana can impact their profitability using the Balanced Scorecard (BSC) framework based on an extensive panel dataset of fifteen banks sampled from the Ghanaian banking industry over a 10-year period (1998- 2007). The results showed that banks that invest greatly in IT enlarged ROA and ROE.

Khrawish and Al-Sa'di (2011) aimed to assess the impact of e-banking services offered by banks on the internet on the profitability of these banks during the period 2000-2009. The findings of this study can be used by newly emerged as well as existing banks to identify the suitable feasible strategies and resources in order to enhance their profitability from e-banking. Banks can also adopt measures to reduce expenses associated with such services and increase the rate of customer adoption. Banks should also emphasize on customer service and training staff members to manage such services in order to optimize gains. In addition, policymakers should consider enacting policies to enable banks to use e-banking services more effectively.

Nevertheless, Vekya (2017) sought to identify the effect of e-banking on the profitability of fourtythree commercial banks in Kenya for the period of nine years from 2007 to 2015 based on a census survey. Overall, findings of the study suggest that the use of Information and Communication Technology (ICT) investments, such as ATM transactions, and POS transactions, have a positive significant effect on bank profitability. Furthermore, mobile transactions do not appear to have any substantial influence on the performance of deposit money banks. These findings highlight the importance of investing in ICT infrastructure for banks in order to reap the full potential of financial technology in a digital age. Moreover, the results indicate that banks should focus their efforts to invest in ATM and POS transactions, while taking into account the implications of mobile transactions in terms of costs and benefits.

Previous studies have disagreed on the relationship between investment in information and communication technology (ICT) and bank performance (BP). Mahboub, (2018) research helps to shed light on this debate by examining the impact of various ICT investments (ATM, MB, IB, TB, BC and POS terminals) on the performance of 50 Lebanese banks for 2009-2016. The CAMELS model was used as the dependent variable. Data was collected from an annual report for each bank. A

multivariate OLS model was then used to analyze the data. The results revealed that ATM, IB, TB and POS had no significant impact on bank performance. However, MB and BC had a notable and direct effect on performance. Therefore, it is suggested that banks in Lebanon should focus on generating more interest in MB applications and offer a variety of BC offerings to entice customers.. De Young, Lang & Nolle (2017) conducted a research to assess the effect of e-banking on the performance of banks in the United States community banks markets. They compared the performance of virtual click and mortar banks with the performance of traditional brick and mortar banks and found that e-banking improved the profitability of banks by minimizing operating costs and thereby increasing their revenues.

Farouk, Hassan, and Mamman (2013) assessing electronic banking products and performance of Nigerian listed deposit money banks where six (6) banks were systematically selected.

The research examined the influence of e-banking products, such as ATMs, e-direct, SMS alerts, and electronic mobile, on the performance of Nigerian deposit money banks (DMBs). An ex-postfactor correlational design with systematic sampling and multilongitudinal panel regression techniques was used upon audited books of accounts in order to assess return on equity (ROE). The findings indicated that adoption of e-banking had a strongly and significantly positive effect on performance of DMBs. However, the impacts of e-direct and SMS alerts were not significant. Results from the Nigerian study were varied, with both positive and negative impacts on bank performance.

Djalilov and Piesse (2019) documented the impact of regulation on bank efficiency by utilizing system GMM via a dynamic panel regression for 21 former Eastern bloc countries spanning 2002-2014. The findings of the system GMM estimation indicate that the restriction of bank activity improved the efficiency of banks in the countries included in this study's population. However, the results from the dynamic panel quantile reveal that the effect of regulation varied across the different quantiles. This research thus has a noteworthy policy implication for transition economies, concerning the impact of banking regulations..

The study by Batten and Vo (2019) did inquire into the factors that impact on bank profitability in Vietnam for the period that spanned from 2006 to 2014. The research conducted employed various econometric techniques to analyze the gathered data, and it revealed that bank size, capital adequacy, risk-taking behaviors, and expenditures all had an influence on earnings. Additionally, the study results suggested that the general characteristics of banking industry structure and other non-bank-specific factors were also associated with bank profit.

METHODOLOGY

The study adopted expost-facto research design for the study. This is because the study was done after the occurrence of the events reflected by the data. Relevant secondary data obtained from the annual reports of the selected DMBs. The study population consist of the twenty-two

(22) deposit money banks in Nigeria as at October 2020. (www.cbn.gov.ng). This study apply purposive non-probabilistic sampling technique. This technique was selected as the most appropriate sampling method as DMBs with the needed information (investment in software) are selected.

The sample size consists of eight (8) Deposit Money Banks in the Nigerian. The sampled DMBs include Access Bank, Zenith Bank, Guarantee Trust Bank, United Bank for Africa, First City Monument Bank, Fidelity Bank, Wema Bank, and Union Bank. They have been selected because their financial statements contains disclosure of key data needed for this study. The study used secondary data source to examine effect of financial technology (software) on the profitability of deposit money banks in Nigeria among the Nigeria banking sector. The data for this study were sourced from the annual report of the selected DMBs banks in Nigeria

MODEL SPECIFICATION

The study builds on the models of but deviates strongly by introducing dynamic considerations in the relationship between financial tecnologt (software) investments and growth of Banks. Lag of one year before observing impact of investment in software was adopted.The study begin by specifying the statistical functional relationship between investment in software and pritability of DMBs;

DG= α1 + βI INVT-SOFT it-1 + uit---------- (6)

Where:

DG	=	Deposit Growth
FIN TECH	=	Financial technology
α1	=	Constant
Bi	=	Coefficient of Independent Variables
I	=	Sample Size
T	=	time
U	=	Error Term

DATA ANALYSIS AND DISCUSSION

The model formulated earlier is tested using the simple linear regression to test the null hypothesis H_o: Investment in financial technology software does not have significant effect on deposit growth in DMB in Nigeria.

$DG_{it} = \beta_0 + \beta_1 INVT\text{-}SOFT_{it} + \mu_{it}$

Table 1. Correlated Random Effects - Hausman Test

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	219.445155	1	0.0000

Source: Author's computation (2021), Using EViews 9.0

Table 1 shows the Hausman test result with the p-value of 0.0000 which is less than the acceptable 0.05 level of significance. Thus, the null hypothesis that random effect is suitable for this model is rejected. Indicating the model should be estimated using fixed effect, thus fixed effect was used and Table 4.2.3b shows the result of the regression estimate.

Table 2 Fixed effect model

Cross-section random effects test equation:				
Dependent Variable: DG				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.817762	0.039997	20.44567	0.0000
INVT-SOFT	58.27427	26.90638	2.165816	0.0372
	Effects Specification			
R-squared	0.994251	Mean dependent var		0.897575
Adjusted R-squared	0.992937	S.D. dependent var		1.227133
F-statistic	756.6324	Durbin-Watson stat		2.140519
Prob(F-statistic)	0.000000			

Source: Author's computation (2021), Using EViews 9.0

Discussion of Hypothesis Three Result

$DG_{it} = \beta_0 + \beta_1 \text{ INVT-SOFT}_{it} + \mu_{it}$
$DG_{it} = 0.817762 + 58.27427 \text{ INVT-SOFT}_{it} + \mu_{it}$

From the results obtained in the Table 4.2.1b above, it is observed that the constant parameter (β0) has a positive coefficient. Investment in software (INVT-SOFT) has a positive effect on the dependent variable deposit growth (DG).

The coefficient of Investment in software (INVT-SOFT) shows that a unit increase in Investment in software (INVT-SOFT) will cause an increase of 58.27427 in bank growth (DG) while when Investment in software (INVT-SOFT) is zero deposit growth (DG) is 0.817762

A critical examination of the results as reported above shows that about 99.4% of the total variation in the dependent variable in deposit growth (DG) can be explained by the explanatory variable Investment in software (INVT-SOFT). This is indicated by the coefficient of determination (R^2) value of 0.994251. This implies Investment in software (INVT-SOFT) account for 99.4% of variation in bank deposit growth (DG). The remaining balance of 0.6% variation in the dependent variable deposit growth (DG) can be explained by other factors outside the variables studied.

The Durbin Watson statistics 2.140519 signifies the absence of auto Correlation. At a significance level of 0.05 the F-statistics is 756.6324 while the p-value of the F-statistics is 0.000000 which is less than 0.05. Therefore, we fail to accept the null hypothesis which means that investment in financial technology software significantly leads to deposit growth in DMB.

CONCLUSION AND RECOMMENDATIONS

The study concludes that there was a strong positive effect of investment in financial technology(software) and the profitability of deposit money banks in Nigeria as it was found that there was a strong relationship between investment in software used by DMBs in Nigeria and their profitability. Software investment of banks was also found to positively influence the deposit growth of the bank.

By investing in bank software, commercial banks are able to reduce their banking costs while enabling customers to benefit from quicker, reliable services through internet platforms. This increased flexibility further allows banks to expand their market reach by offering customers greater coverage, interactivity and accessibility than conventional banking channels. Through this, customers are provided with convenience and immediacy whilst banks reap the cost savings.

RECOMMENDATION

Deposit Money Banks should formulate policies that will facilitate effective utilization of Information Technology. Staff should be well trained on the use of the software they are using in other to derive the utmost benefit from the investment in the software. Also, Customers should be encouraged to embrace new technological development banks adopt to ease their transaction processes and better service delivery. Installing security alerts on Bank's information technology can help prevent unethical and unprofessional practices on the Bank Software by both bank officers and customers.

The examined the effects of investment in bank software on the profitability of DMBs in Nigeria. Furthermore, a study should be conducted to assess the association between internet banking and the financial performance of deposit money banks in Nigeria. Various factors should be considered that would motivate financial institutions to update and adopt the new technology of banking. Furthermore, an investigation should be done to determine the factors that prompt DMBs to invest in bank software. From the findings, it was recommended that a deeper analysis should be conducted on the impacts of electronic banking on the market share of DMBs in Nigeria. Additionally, research should be done to explore the correlation between legislation and substantial investment in software among DMBs in Nigeria to further boost their profitability.

RECOMMENDATION FOR FURTHER STUDY

Lastly, The industry has in recent time been withnessing some other new development. Further study could focus on these new areas which include digital banking system, mobile money operations, fintech and how these new development affect the industry in the area of risk, profitability, general performance, competitiveness, sustainability as well as customers' fund.

REFERENCE

Aduda, J., & Kingoo, N. (2012). The relationship between electronic banking and financial performance among commercial banks in Kenya. *Journal of finance and investment analysis*, *1*(3), 99-118.

.

Agbolade, O. K. (2011). Information and Communication Technology and Banks' Profitability in

Nigeria. Australian Journal of Business and Management Research, 1(4), 102-107

Almaqtari, F. A., Al-Homaidi, E. A., Tabash, M. I., & Farhan, N. H. (2019). The determinants of profitability of Indian commercial banks: A panel data approach. *International Journal of Finance & Economics*, *24*(1), 168-185.

Batten, J., and Vo, X. V. (2019). "Determinants of Bank Profitability—Evidence from Vietnam." *Emerging Markets Finance and Trade* 55 (6): 1417–1428.

Binuyo, A.O. and R.A. Aregbeshola, (2014). The impact of information communication technology on commercial bank performance. Problems and Perspective in Management.

De Young R., Lang W. W. & Nolle D. L. (2017). How the internet affects output and prformance of US community banks. *Journal of Banking and Finance* 31(2), 1033-1060.

Djalilov, K., & Piesse, J. (2019). Bank regulation and efficiency: Evidence from transition countries. *International Review of Economics & Finance*, *64*, 308-322.

Ekinci, R., & Poyraz, G. (2019). The effect of credit risk on financial performance of deposit banks in Turkey. *Procedia Computer Science*, *158*, 979-987.

Farouk, M. A., Hassan, S. U., & Mamman, A. (2013). Electronic banking products and performance of Nigerian listed deposit money banks. *American journal of computer technology and application*, *1*(10).

Haris, M., Yao, H., Tariq, G., Malik, A., & Javaid, H. M. (2019). Intellectual capital performance and profitability of banks: Evidence from Pakistan. *Journal of Risk and Financial Management*, *12*(2), 56.

Jalal-Karim, A., & Hamdan, A. M. (2010). The impact of information technology on improving banking performance matrix: Jordanian banks as case study. In *European Mediterranean and Middle Eastern Conference on Information System* (pp. 21-33).

Khrawish, H. A., & Al-Sa'di, N. M. (2011). The impact of e-banking on bank profitability: Evidence from Jordan. *Middle Eastern Finance and Economics*, *13*(1), 142-158.

Le, T. D., & Ngo, T. (2020). The determinants of bank profitability: A cross-country analysis. *Central Bank Review*, *20*(2), 65-73.

Mahboub, R. M. (2018). The impact of information and communication technology investments on the performance of Lebanese banks. *European Research Studies*, *21*(4), 435-458.

Mahboub, R. M. (2018). The impact of information and communication technology investments on the performance of Lebanese banks. *European Research Studies*, *21*(4), 435-458.

Mahboub, R. M. (2018). The impact of information and communication technology investments on the performance of Lebanese banks. *European Research Studies*, *21*(4), 435-458.

Masocha, R., & Matiza, T. (2017). The Role of E-Banking on the Switching Behaviour of Retail Clients of Commercial Banks in Polokwane, South Africa. *Journal of Economics and Behavioral Studies*, *9*(3(J), 192-201. https://doi.org/10.22610/jebs.v9i3(J).1758

Mensah, G. A. (2017). *The effect of information and communications technology on financial performance of rural banks in Ghana* (Doctoral dissertation).

Mensah, G.A. (2016). The Effect of Information and Communications Technology on Financial Performance of Rural Banks in Ghana. Master Thesis, Department of Marketing and Corporate Strategy, School of Business, Kwame Nkrumah University

Muraina, S. A. (2018). Determinants of listed deposit money banks' profitability in Nigeria. *International Journal of Finance and Banking Research*, *4*(3), 40-56.

Nwaeze, N. C. (2021). Impact of Financial Technologies Adoption on the Performance of Domestic Systemically Important Banks in Nigeria. Economics and Finance, Volume 9, Issue 3, 52-67. *Economics and Finance*.

Ogare, H. O. (2013). *The effect of electronic banking on the financial performance of commercial banks in Kenya* (Doctoral dissertation, University of Nairobi).

Ousama, A. A., Hammami, H., & Abdulkarim, M. (2020). The association between intellectual capital and financial performance in the Islamic banking industry: An analysis of the GCC banks. *International Journal of Islamic and Middle Eastern Finance and Management*, *13*(1), 75-93.

Phan, D. H. B., Narayan, P. K., Rahman, R. E., & Hutabarat, A. R. (2020). Do financial technology firms influence bank performance?. *Pacific-Basin finance journal*, *62*, 101210.

Shabbir, M. S., & Wisdom, O. (2020). The relationship between corporate social responsibility, environmental investments and financial performance: evidence from manufacturing companies. *Environmental Science and Pollution Research*, *27*, 39946-39957.

Sumra, S. H., Manzoor, M. K., Sumra, H. H., & Abbas, M. (2011). The impact of e-banking on the profitability of banks: A study of Pakistani banks. *Journal of Public Administration and Governance*, *1*(1), 31-38.

Vekya, J. M. (2017). Impact of electronic banking on the profitability of commercial banks in Kenya. *Journal of Technology and Systems*, *1*(1), 18-39.

Yüksel, S., Mukhtarov, S., Mammadov, E., & Özsarı, M. (2018). Determinants of profitability in the banking sector: an analysis of post-soviet countries. *Economies*, *6*(3), 41.

APPENDIX

	INVESTMENT IN SOFTWARE					
	2015	2016	2017	2018	2019	2020
ACCESS BANK	2,146,643	1,818,744	1,873,348	3,418,069	6,601,488	7,905,935
ZENITH BANK	1,981,000	2,066,000	5,418,000	3,260,000	2,505,000	2,366,000
GTB	1,003,673	2,153,981	2,726,244	2,934,888	6,210,780	3,125,034
UBA	772,000	177,000	348,000	274,000	14,000	10,605,000
FCMB	0	0	0	1,407,478	1,626,271	0
FIDELITY BANK	739,000	143,000	369,000	2,879,000	2,183,000	8,399,000
WEMA BANK	555,863	233,677	535,214	577,531	596,662	708,158
UNION BANK	1,913,000	634,000	2,191,000	2,191,000	1,515,000	1,634,000

	CUSTOMERS' DEPOSIT					
	2015	2016	2017	2018	2019	2020
ACCESS BANK	1,528,213,883	1,813,042,872	1,910,773,713	2,058,738,930	3,668,339,811	4,832,744,495
ZENITH BANK	2,333,017,000	2,552,963,000	2,744,525,000	2,821,066,000	3,486,887,000	4,298,258,000
GTB	1,422,550,125	1,681,184,820	1,697,560,947	1,865,816,172	2,086,810,070	2,881,686,058
UBA	1,627,060,000	1,698,859,000	1,877,736,000	2,424,108,000	2,764,388,000	3,824,143,000
FCMB	0	0	0	802,853,211	918,301,254	0
FIDELITY BANK	769,639,000	792,971,000	775,276,000	979,413,000	1,225,213,000	1,699,026,000
WEMA BANK	284,977,836	283,328,215	254,487,050	369,314,164	577,283,469	804,873,392
UNION BANK	569,116,000	633,827,000	796,708,000	844,413,000	886,328,000	1,131,116,000