EFFECT OF DIGITAL BANKING ON ECONOMIC GROWTH IN NIGERIA (2009-2023)

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ABSTRACT

The study examined the effect of digital banking on economic growth in Nigeria. The specific objectives are to: examine the effect of automated teller (ATM) machine; analyse the effect of point of sale (POS) and evaluate the effect of mobile (MOBILE) banking on economic growth in Nigeria from 2009 to 2023. The study was arranged through ex-post facto research design, through which secondary data on ATM, POS, Mobile banking and real gross domestic product are sourced and obtained from Central Bank Statistical Bulletin. The data were analysed using regression analysis which involved ordinary least square estimate. The results indicate that point of sale (POS) and automated teller machine (ATM) have positive and significant effect with their p –values at 0.0502 and 0.0171 respectively on economic growth, while mobile banking has no significant effect with a p-value of 0.110) on economic growth in Nigeria. The overall model is significant (Adjusted R^2 is 92%), which implies that the model is not bias. The study concluded that digital banking has positive and significant effect on economic growth in Nigeria. Hence, the study recommended that Central bank of Nigeria should make more public awareness on digital banking in the country.

Keywords: *Automated Teller Machine (ATM), Point on Sale (POS), Mobile Banking (MB)*

1.0 Introduction

The operations of banks were manually carried out in the past before the emergence of Digital banking which is also known as electronic banking, and this resulted in slowdown in the financial transactions. This manual process involves humans recording transactions on ledgers and many a times counting of money which should be done through counting or electronic machine were computed and counted manually which is not a very accurate method, and therefore prone to human errors. Babatunde and Ogbeide (2017) opined that electronic banking is an online banking system that gives everyone the opportunity to access banking activities without goin into the banking hall, thus promoting financial inclusion. The study study further revealed that the banking activities may include knowing an account balance, making electronic money transfers and retrieving an account history electronically. Electronic banking is the process of using computers and telecommunications to enable banking transactions be done by computers or telephones instead of through human interaction (Okoro, 2014).

Edet (2008) defined electronic banking as a banking transaction method in which transactions are resolved electronically with the use of electronic gadgets such as ATMs, POS terminals, GSM phones,

and V-cards e.t.c. handled by e-holders, bank customers, and stake holders. Electronic banking can come in different forms. The use of Point of Sale (POS), internet banking, Automated Teller Machines and Mobile banking are different forms of electronic banking. A POS transaction refers to what happens when a product or service is purchased by a customer from a merchant, using a point of sale machine. A POS system is similar to a POS terminal. Nevertheless, a POS terminal refers to the electronic equipment that processes the credit/debit card payments. The POS software coupled with the computer terminal is used by most businesses to manage operations and transactions (Okoro, 2014).

Okoro (2014) defines online banking as an electronic payment system that allows customers of any financial institutions to conduct a wide range of financial services through the financial institution's website. Electronic banking gives one the ability to manage his/her money online with a mobile device or computer. The stress of visiting a bank, which has been very inconvenience for some individuals, to carry out a transaction is greatly or completely eradicated. An Automated Teller Machine (ATM) is an electronic telecommunications machine that enables customers of financial institutions to perform financial transactions, like cash withdrawals, deposits, transfer funds, or obtaining account information, at any time and without the need for direct interaction with bank staff (Okoro, 2014).

The machines are operated with the bank designated electronic cards. Mobile banking is a form of electronic banking service provided by any financial institutions that allow its customers to carry out such financial transactions from anywhere all over the world using their mobile phones. This is done through the use of mobile Apps created by the banks. Economic growth is an increase in the amount of economic goods and services produced in a particular country within a certain period of time. This can be measured in nominal or real (adjusted for inflation) terms. And that traditionally, aggregate economic growth is measured in terms of gross national product (GNP) or gross domestic product (GDP) (Njoku et al, 2020).

Britannica (2019) defines it as the process by which a nation's wealth increases over time. Unlike other countries of the World, the idea of electronic banking was not introduced early in Nigeria. The first bank to introduce online banking system in Nigeria was the Societe Generale Bank of Nigeria (SGBN), which was established in 1986 and the online banking was initiated in its 5 branches in Lagos Metropolis. However, a number of Nigerian banks did not adopt the e-banking system until the early 2000s. Today, the most used electronic payment systems in Nigeria are ATM, Internet Banking, Mobile Banking, and Point on Sale (POS). In the recent time, e-banking has been seen as the powerful tool influencing the landscape of the banking sector fundamentally, in particular, towards a more competitive industry. E-banking has bridged the gap between different financial institutions, which also enabled new products and services in the financial industry and made the existing ones available in different packages (Agbala, 2018). The flexibility, speed, accessibility and convenience of Electronic Banking has made to be widely accepted and embraced by the masses. It allows users to easily make transfer of funds, make purchases (both online and offline), and also pay bills; faster and at a lower cost. This study aims at carefully evaluating the effect of digital banking on the economic growth of Nigeria.

In fact**,** electronic banking system should be a system by which at least 70% of all banking transactions and services are carried out by the customers without stepping a foot into the banking hall. This means that a perfect internet and mobile banking system is there to satisfy the need of all the electronic banking users. The Automated Teller Machine (ATM) and Point on Sale (POS) systems should be readily available to satisfy all deposit and withdrawal needs. But this happens only in an ideal World. This would enhance the role of banks as financial intermediaries. The intermediation efficiency entails financial intermediaries being able to harmonise the transfer of funds from the surplus spending units to the deficit spending units and vice versa. Unfortunately, the Nigerian banking system is not completely

efficient yet, as there are lapses evident in the day to day running of electronic banking by Nigerian banks today (Njoku et al, 2020).

These lapse ranges from delayed transaction process time, delayed remittance time in case there was a failed transaction. Most times it takes the bank 15-20 working days to track a failed transaction on a Point-of-Sale system. This leaves the customers in fear, as most Nigerians are poor and can't afford to have their money pending while the banks conduct their rigorous search on the transaction. Another problem worthy of mention is in the low rate of adoption by the citizens of the country. The government introduced a policy termed "Cashless Policy" in the year 2012. Even as there are different ways of withdrawing money electronically; people still flood the banking halls to manually withdraw their money on a daily basis. One of the major reasons Nigeria adopted a cashless policy, which gave rise to electronic banking was to combat corruption in the country (Njoku et al, 2020). But unfortunately, that didn't stop corruption instead, it upgraded their means of operation. These days, with just a tap of a finger on a tablet or computer, one can easily empty the account of another without having to carry any physical cash. Some decades back, robbers take 'Ghana must go' bags to banks or people's houses to rob them of their physical cash. These days robbers go to people with POS systems and have them insert their debit cards to have their accounts emptied. Banks have had moments when their systems were hacked into, and millions of money electronically embezzled in a space of some minutes or hours. These are the issues in the past, where the introduction of electronic banking in the recent time seems necessary.

Asides, the general issues, there have been series of empirical investigation on the subject mater but not many authors have submitted a detail report on the data investigation which this study proposes to examine. Scholars like Muhammed (2022), Ozurumba and Onyeiwu (2019), Isibor, Omankhanlen, Okoye, Achugamonu, Adebayo, Afolabi and Ayodeji (2018), Babatunde and Salawudeen (2017), Ogbeide, Nwamaka and Ishiuwu (2016), Okifo and Igbunu (2015), Musa, Kurfi, and Hassan (2015) among others focused attention mostly on how digital banking affect banks performance with sparse evidences on economic growth, this suggests that the role of digital banking on economic growth is not better studied than now. Therefore, the study examined the effect of mobile banking, Point-on-sale and Automated Teller Machine on the economic growth of Nigeria, and the study's period rages from 2009 to 2023. The period is justified on the basis of data collection for the years respectively.

2.0 Literature Review

Digital Banking

Digital banking refers to a situation where deposits taking financial institutions who are members of a deposit insurance scheme deliver banking services primarily through electronic banking system instead of physical branches (Johannes et al, 2020). Though, this does not automatically implies that the digital banks should not have physical presence as some still maintain offices to carry out other important services, however, the need for customers to visit bank branches for transfer of funds, account opening, bank account balance checking, make deposits and access other banking services are dispensed with.

E-banking

Electronic banking is defined as the use of computer to carry out banking transactions such as withdrawals through cash dispensers or transfer of funds at point of sale. It is a means of information that reveal how much a person has deposited and has spent are needed (Adu, 2016). According to Akobodun (2014), e-banking is a payment platform where users pay money in advance into their e- money account or create an e-money account that is linked to their credit card or bank account.

An example of this is PayPal, which allows users to create an account by filling in a form on their website and providing their credit card or bank account details, from which money will be drawn for payments. This payment system makes more use of computer networks and internet access. Emmanuel and Sife (2018) discussed that card and electronic payment systems have certain advantages when compared to cash and cheque payment systems. For instance, unlike the cash payment system, where once the physical cash is stolen one's hope of getting that money back is minimal, with a card payment system, there is greater amount of security. Visa or Master Card for instance have authentication and authorization features such as a card number, a CVV and a secured PIN. The PIN is only known to the card owner, so in the case where the card is stolen, it will be difficult for an unauthorized person to withdraw money. With the biometric card, where the card owner's finger- print is embedded into the system, without which a transaction cannot be approved, gives a high level of security and trust among its users. However, one of the limitations of the card payment system is that to withdraw money or to make payment, one has to look for the appropriate terminal, such as an ATM or a POS before their transaction can be effected. This is a disadvantage, especially in a situation where there are not many ATMs deployed, or where the ATMs machines are out of service (Emmanuel & Sife, 2018).

Automated Teller Machine (ATM)

Rose (2019) describes ATMs as follows: "an ATM combines a computer terminal, database system and cash vault in one unit, permitting customers to enter the bank's book keeping system with a plastic card containing a PIN or by punching a special code number into the computer terminal linked to the bank's computerized records 24 hours a day". A computerized telecommunication system that provides financial institution customers a method of financial services in a public space without the need for human assistant or bank teller is referred to as Automated Teller Machine (ATM) (Olayemi, 2014). An ATM card gives customers the opportunity to withdraw cash from his bank account by entering a personal identification number (PIN) and having the amount of the withdrawal immediately debited to his account Weiner (1999). For Nigerian, the deployment of Automated Teller Machines ATMs, in 2006 by Nigerian banks was one of the benefits of the banking sector consolidation exercise.

It revolutionized the payment system in the economy and relieved businessmen of the burden of carrying cash. ATMs also offered them convenient access to their deposits at any hour of the day. More so, the widespread location of ATMs in churches, bars, hotels, markets, school, hospitals, filling stations and street of Nigeria major cities further enhanced this convenience (Adebiyi, 2013), and with varieties of benefits to the customers. Though, recently, it has been observed that fraudsters use the ATMs to steal funds from bank depositors (Okechukwu, 2011).

Mobile Banking

Literarily, mobile banking refers to the core functionality of all bank transactions on a mobile device. Mobile banking is a service provided by bank and it allows customers to conduct financial transactions using a mobile device. Mobile phones are increasingly being used for financial transactions in Nigeria. They enable their customers to conduct some banking services such as account balance inquiry and funds transfer (Central Bank of Nigeria, 2013). As a result of high usage of mobile phones and high number of telecommunication companies in urban and rural areas, mobile banking has been made viable. According to Adewoye (2013), financial transaction such as making transfers between account balances, checking account balances, or paying bills, etc., conducted by logging onto a bank website using a cell phone is referred to as mobile banking. It is a term used to describe financial transaction performed through the use of mobile device such as the mobile phone. It involves conducting banking business and services via the use of mobile phone devices. One of the major characteristics of mobile banking is that it is always available 24/7. Gupta (2013), define mobile banking as "Mobile Banking is

an application of mobile computing which provides customers with the support needed to be able to bank anywhere, anytime using a mobile device and a mobile service such as Short Message Service (SMS). Mobile banking system offers a number of benefits such as availing customers the opportunity to access their accounts, and make financial transactions without going into the banking hall.

Point-on-Sales (POS)

An electronic card is a physical plastic card that distinctively identifies the holder and which enables the holder to perform financial transaction via the internet. For example, ATMs and POS terminals are used to authorize payment to the merchant or seller (James, 2019). According to (Olayemi, 2014) ATMs are computerized telecommunication device that provides financial institution customers a method of financial transaction in a public space without the need for human clerk or bank teller. The POS terminal also serves like the ATMs. In this case, upon completing the transaction and the value ascertained, the amount is entered into a POS terminal into which the electronic card has been slotted.

The cash equivalent of the amount is transferred from the payer's account into the account of the payee automatically (Olaegbe, 2011). A Point of Sales (POS) terminal is a machine used to accept cards for purchase and payment of goods and services. It is now being generally used for cash withdrawer by the bank customers. POS Terminal allows a cardholder to have a real-time online access to funds and information in his/her bank account through debit or cash cards. An ATM card allows a customer to withdraw cash from his bank account by entering a personal identification number (PIN) and having the amount of the withdrawal immediately debited to his account Weiner (2019).

Economic Growth

The concept of economic growth has to do with the increase in the output level of an economy which can also mean an increase in income level. Economic growth of a country can be determined in the productivity level, volume of trade, investment in both human and physical capital. Economic growth as used in this study refers to increase in the total goods and services produced in an economy. Pritzker, Arnold and Moyer (2015) identified Gross Domestic Product (GDP) as the economic indicator which measures the value of the goods and services produced in an economy in a given time period. They stated that GDP is a measure of the economy's output and is a measure of current production, not sales.

Thus GDP, is the market value of all final goods and services produced in a country in a given time period and it indicates an economy's performance (economic growth). When a GDP is measured using the current market prices it is called a nominal GDP, but when a certain base year is used for the calculation of a GDP, it is called GDP.

Task Technology Fit (TTF) Theory

The theory of Task Technology Fit (TTF) was propounded by Goodhue and Thompson in the 1995. The theory postulate that Information Technology will most likely impact positively on individual performance and be used if the capabilities of information communication and technology (ICT) match the tasks that the user must perform. This means that the usefulness of financial innovation lies in the capability of the user and its value in helping the user achieve a certain purpose. According to the theory, some factors that measure task-technology fit are: quality, locate-ability, authorization, compatibility, ease of use/training, production timeliness, systems reliability and relationship with various users. This model is useful to this study because of the diverse range of information systems including electronic commerce systems and combined with or used as an extension of other models related to information systems outcomes. The theory maintains that for information system to be

successful there must be a match between business tasks and information technology adopted (Zigurs & Buckland, 1998).

Empirical Review

Hannington (2013) examined the effect of e-banking on the financial performance of commercial banks in Austria. The study makes use of descriptive and inferential statistics to analyze the secondary data used. The study found out that e-banking has a strong and significant effect on the profitability of commercial banks in the Austrian banking industry. Sana, Mohammad, Hassan and Momina (2011) examined the impact of e-banking on the profitability of Egyptian banks, in particular using qualitative data. Their study covered twelve banks across Egypt. Their study was qualitative in nature which examined different objectives that determines the performance of banks mainly in terms of profitability.

The results of their study showed that e-banking has increased the profitability of banks; it has enabled the banks to meet their costs and earn profits even in the short period of time. Aduda and Kingoo (2012) carried out a study on the relationship between electronic banking and financial performance among commercial banks in Kenya. Using return on assets as proxy for financial performance and investment in e-banking, number of ATMs and number of debit cards issued to customers as surrogate for e-banking, the results reveal that positive relationship exists between e-banking and bank performance. Meihami et al (2013) examined the effect of using electronic banking on profitability of banks using both descriptive and inferential statistics. The findings show that electronic banking has improved the performance of banks measured by bank incomes. Maiyaki and Mokhtar (2010) using a survey of 417 bank customers in 33 organizations in Kano state of Nigeria, examined effects of electronic banking facilities, employment sector and age-group on customers' choice of banks in Nigeria, and found that availability of electronic banking facilities such as ATM, online operation and telephone banking do not have significant influence in customer's decision to choose banks. This according to them could perhaps be explained by the fact that presently, almost all the players in the Nigerian banking sector do have electronic facilities. Jokuku and Sajuyigbe (2012) in their study on the impact of Electronic Banking on Human Resources Performance in the Nigerian Banking Industry, using data from 35 respondents randomly selected from 5 branches of first bank Ltd, revealed that the introduction of electronic banking in the Nigerian Banking Sector has helped tremendously in improving the productivity of bank personnel, leading to efficiency and effectiveness in service delivery. Babatunde and Salawudeen (2017) examined the impact of e-banking in Nigerian banking industry and financial institutions. The study employs both descriptive and inferential statistics to analyze data. Findings show that 22 credit officers or 63.9% of the respondents agreed with the opinion that e-banking system has made banking transactions easier, 11 credit officers representing 31.45% strongly agreed while 2 credit officers representing 5.7% were undecided and none of them either disagreed or strongly disagreed. Effiom and Edet (2020) employs autoregressive distributed lag methodology on quarterly data of financial innovation measures to determine the effect of financial innovation on performance of SMEs in Nigeria. The findings indicate that financial innovation has a positive and significant effect on SMEs' productivity in Nigeria. In particular, of the seven financial innovation instruments used (Automated Teller Machine, Point of Sales, Web or Internet Banking, Cheques Nigeria Inter-Bank Settlement System Electronic Fund Transfer, Nigeria Inter-Bank Settlement System Instant Payment, and Mobile Money Operations), all but one turned out in both the short run and long run as significant predictors of SMEs' performance in Nigeria. Nwakoby et al. (2020) analysed the effects of electronic payments on the performance of 9 selected banks out of 15 quoted in the Nigerian stock exchange. The research work made use of the OLS regression technique of analysis using ATM transactions, POS transactions, and mobile payments as proxies for electronic banking with return on equity as a measure of banks' profitability. The results revealed that ATM transactions have a negative effect on return on equity of DMBs. While both POS and mobile payment has a positive impact on return on equity of DMBs in Nigeria.

3.0 Methodology

Ex post facto research design was adopted for the study, and the its specifically examines how electronic banking affect the economic growth in Nigeria. The study adapted Muotolu and Nwadialor (2019) in their studies on cashless policy in Nigeria and its impact on the financial performance of commercial banks.

Muotolu and Nwadialor (2019) model which is stated as follow:

$$FP = f\ (ATM, POS, INTERNET, MOBILE) \quad 3.1$$

The present study adapted the variables used by Muotolu and Nwadialor (2019) by replacing financial performance with economic growth parameter which is real gross domestic product. The reason for this modification is to account for the role of real gross domestic product on national economy.

The proposed model for the study is therefore stated as:

$$RGDP = f\ (ATM, POS, MOBILE) \quad 3.2$$

$$RGDP = \alpha_0 + \alpha_1 lnATM_t + \alpha_2 lnPOS_t + \alpha_3 lnMOBILE_t + U_t \quad 3.3$$

Where:
RGDP = Economic growth
ATM = Automated Teller Machine
POS = Point of Sale
MOBILE = Mobile banking/Mobile pay
f = functional term
e_t = error term

Presentation of Results and Discussion of Findings

This portion of the study presented the result and discussion of findings. Noticeably, the study is on digital banking and economic growth in Nigeria, as such, the study made use of variables of real gross domestic product, ATM, POS and MOBILE banking system.

OLS Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.286155	0.148893	-1.921884	0.0455
ATM	0.290317	0.113993	2.546805	0.0171
POS	0.161066	0.080934	2.990102	0.0502
MOBILE	0.099449	0.060183	1.652432	0.1105

R-squared	0.934925	F-statistic	172.4019
Adjusted R-squared	0.929502	Prob(F-statistic)	0.000000
Observation	14	Durbin-Watson stat	1.591715

Source: E-view 9.0 version (2025)

The relationship between the components of ATM, POS, MOBILE and real gross domestic product was mathematically expressed as:

RGDP = -0.286155 + 0.290317_{ATM} + 0.161066_{POS} + 0.099449_{MOB} + μ

The result revealed that ATM has a significant and positive effect on real gross domestic product with p-value 0.0171. Therefore, it can be concluded that the ATM has the coefficient of 0.290317 implying that ATM increased economic growth by 29.03% in the short run. Also, the result further showed that the POS positively and significantly related to real gross domestic product in Nigeria with the p-value 0.0502, and with positive coefficient of 0.16106. This implied that the POS significantly increased investment growth by 16.11%. Also, MOBILE banking has a positive coefficient (0.099449), but insignificant (p-value 0.1105) effect on real gross domestic product growth in Nigeria. All things being equal, 1 percent change in MOBILE banking will positively increase economic growth by in Nigeria by 9.94%. The result is however at variance with the result of the long run relationship. The coefficient of multiple determinations (R^2) as given in the result of the ordinary least square of e-view 9.0 is given as 0.934925 which implies 93% with an adjusted R^2 of 0.929502, which implies 93%. Therefore, the result explains that the explanatory variables of (ATM, POS and MOBILE) accounted for 93% behavior of the dependent variable economic growth) while the remaining 7% is accounted for by the stochastic variable.

Table 1: Summary of t-test

Variables	T-calculated	T-tabulated	H_0	H_1	Remark
ATM	2.546805	1.921	Reject	Accept	Significant
POS	2.990102	1.921	Reject	Accept	Significant
MOBILE	1.652432	1.921	Accept	Reject	Not significant

The table 1 explored that ATM and POS variables were statistically significant at 5%. Precisely, the t-value of ATM and POS were expressed as 2.54 and 2.99 with greater influence while MOBILE was expressed as 1.65 with lesser influence over t-tabulated value of 1.92. Hence, the study concluded that while ATM and POS have significant effect on the dependent variable, whereas MOBILE does not.

4.0 Discussion of Findings

Empirically, the study investigated the effect of international trade on economic growth in Nigeria from 2009 to 2023 using proximate of automated teller machine (ATM), point of sale (Point on Sale), mobile banking Mobile Banking) and Real Gross Domestic product. The researcher designed his research objectives based on the variables, and tested using OLS and t-test of regression analysis.

Taking a careful look at the result of the regression analysis, it was revealed ATM and POS have significant positive effect on economic growth in Nigeria. The implication of the result is that digital banking has the tendency and magnitude of transmitting financial resources electronically into the economy in Nigeria. Thus, with the advent and enactment of digital banking, gross domestic product will not suffer any setback thereby leading to positive and progressive economic performance of government in Nigeria. Nonetheless, the insignificant MOBILE banking calls for public awareness on the importance of the tool as an aid to improve investment growth in the country. The study is consistent with the empirical finding of Ozurumba and Onyeiwu, (2019) that digital banking would increase economic growth via innovation growth.

5.0 Conclusion

The roles of digital banking in the growth of the Nigeria economy cannot be undermined. Hitherto, the study has received series of local and international debates across the globe which makes researchers and theoretical thinkers come to the conclusion that digital banking contributes to economic growth.

The speed and ease of transactions especially payment goes a long way to determine peoples spending and ultimately economic growth. The components of digital banking in this study, which include the value of transactions via the MOBILE banking, ATM and POS transactions, together affect economic growth. Based on the finding from regression analysis which involve ordinary least square approach of multiple regression technique, the study found that Automated teller machine (ATM) and point of sale (POS) have positive and significant effect on economic growth in Nigeria, it further revealed that though the contribution of MOBILE banking is positive, yet, its effect is insignificant on economic growth. As a way of empirical linkage, the study associates with the empirical finding of Ozurumba *et al* (2019) that digital banking significant enhance the performance of economic growth in Nigeria.

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