

# The Effects of Electronic Banking on Growth of Deposit Money Banks in Nigeria

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## Abstract

Using time series data for the period 2006- 2012, this study examined the effects of electronic banking on growth of deposit money banks in Nigeria. Data were collected from secondary sources through annual reports and statistical bulletin of Central Bank of Nigeria. Electronic banking was measured using the total value of internet and mobile banking while growth was measured using the value of total deposits and total assets of deposit money banks in Nigeria. A total deposit was regressed on internet and mobile banking, while a total asset was regressed on internet and mobile banking using multiple regression technique. The study revealed that positive relationships exist between mobile banking and total deposits, and between internet banking and total asset while on the other hand, no significant relationships between internet banking and total deposits, and between mobile banking and total asset. It is therefore recommended that banks that want to improve their deposit growth performance must offer numerous products/services through mobile phones in an effective, efficient and cost effective manner. They must also make mobile banking application all mobile phones enabled so that those customers who can not afford Java enabled mobile phones can also use the product. The study also recommends that banks that want to increase their asset holdings must offer numerous, efficient and cost effective secured transactions through the internet.

**Key words:** Electronic banking, Growth, Deposit money banks, Nigeria

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## 1. Introduction

The evolution of electronic banking in Nigeria can be traced to 1986 when the banking sector was deregulated. The result of this deregulation brought far-reaching transformation through computerization and improved bank service delivery. Competition with new products became keen within the system while customer sophistication posed a challenge for them, hence the reengineering of processing techniques of business accounts encourage the automation of financial services especially among new generation of commercial and merchant banks (Oluwatolani, Joshua & Philip, 2011).

The 21<sup>st</sup> century has witnessed a dramatic evolution in the financial service industry as a result of the rapid advancement in technological transformation which has become known as e-developments. These changes have engulfed all areas of financial intermediation and financial markets such as e-finance, e-money, electronic banking (e-banking), e-brokering, e-insurance, e-exchange and e-supervision. This new information technology (IT) is turning into the most important factor in the future development of banking, influencing bank's marketing and business strategies. As a result of rapid advances in IT and intensive competition in the banking sector, the adoption of e-banking is being increasingly used as a channel of distribution for financial services (Mahdi & Mehrdad, 2010 cited in Fonchamnyo, 2013).

The world has witnessed an upsurge of electronic payment instruments meant to facilitate trade and simplify payments before the introduction of electronic payment into Nigerian banking system; customers had to walk into the banking hall to do transactions of all kind. They had to queue up and spend more hours to talk to a teller to make their transactions. Inconveniences caused by these long queues discourage most customers who sometimes renegade from the queues in annoyance. For many years, bankers, IT experts, entrepreneurs and others have advocated for the replacement of physical cash and the introduction of more flexible, efficient and cost effective retail payment solutions (Siyanbola, 2013).

Electronic banking has experienced explosive growth and has transformed traditional practices in banking (Gonzalez, 2008).

This study examine the effects of electronic banking on growth of deposit money banks in Nigeria with reference to internet banking, mobile banking, total deposits and total asset.

### *1.1 Statement of the Problem*

Since independence, the financial sector has been on the increase. Today, we have over 20 strong banks and well functional stock market. Other financial institutions like insurance, financial companies etc. are growing. Also included are specialized banks such as industrial development banks, agriculture and rural development banks and mortgage banks. The financial sector has been liberalized in Nigeria. However, despite the growth record of banks and non-bank financial institutions in Nigeria, and financial liberalization policy, the Nigeria economic growth is sluggish (Maduka & Onwuka, 2013).

Banks appear very profitable in Nigeria, whether returns on assets are assessed on country by country, income group or by individual banks. The Nigerian economy observed in the present dispensation has been characterized by worsening economic fortunes in terms of reduced growth, increased unemployment, galloping inflation, high incidence of poverty, worsening balance of payment conditions, high debt burden and increasing unsustainable fiscal deficit. There are management challenges confronting Nigeria banks since the advent of indigenous banks. Aside loss experienced by depositors, shareholders, employees and other stakeholders, the level of confidence in the financial system has been negatively affected (Bosede, Olusegun & Olubukunola, 2013).

Before the emergence of modern banking system, banking operation was manually done, and that solely account for the inefficiency in handling transactions. This manual system involves posting of transactions from one ledger to another without the aid of computer systems. Computations which should be done through computer or electronic machines were done manually, which sometimes lead to miscalculation due to human errors, which results in extension of closing hours when account is not balanced on time (Siyanbola, 2013).

Traditional banking system was often characterized by delay and inefficiency in the delivery of financial services which led to introduction of electronic banking. The introduction of electronic banking system which was supposed to bring about efficiency and effectiveness in service delivery, reduce queues and cash handling, rather resulted to disappointment to customers. Most customers complain of time wasted in banks, mostly due to long queues and network downtime due to poor connectivity between central server and the branches. Bank customers still handle too much cash and rarely people discuss about electronic banking products and services offered by banks.

The major difficulties users face in carrying out electronic payments are network (communication links between banks and e-payment infrastructure) issues, literacy, concerns on risk and unreliable machines (Agbaje & Ayanbadejo, 2013).

The adoption of electronic banking has brought major challenges to the banking industry in terms of risk exposure. The volume of deposits has increased as well as fraudulent practices experienced by Nigerian banks since its adoption in the economy (Chibueze, Maxwell & Osondu, 2013). This is the reason why Ovia, (2001) posits that Nigeria's banking scene has witnessed phenomenal changes especially in the enormous volume and complexity in the product or service delivery, financial liberalization and business process re-engineering. The effectiveness of deploying information technology in banks therefore can not be put to doubt. The fact remains the reality of using IT in banks is necessitated by the huge amount of information being handled by these banks on daily basis. On customer's side, cash is withdrawn or deposited, cheques are deposited or cleared, statement of accounts are provided, money transfer, bills payment facilitated etc. at the same time, banks need up-to-date information on accounts, credit facilities and recovery, deposit, charges, income, growth indices, performance indicators and other control of financial information (Chibueze et al., 2013). However, researchers have not given much attention to this revolution caused by electronic banking with the regard to growth performance of banks.

### *1.2 Objectives of the Study*

The main objective of the study is to examine the effects of electronic banking on growth of deposit money banks in Nigeria. Specifically the study objectives are:

- i. To determine whether internet banking has any effect on total deposits of deposit money banks in Nigeria.
- ii. To find out whether mobile banking has any effect on total deposits of deposit money banks in Nigeria.
- iii. To examine whether internet banking has any effect on total asset of deposit money banks in Nigeria.
- iv. To assess whether mobile banking has any effect on total asset of deposit money banks in Nigeria.

### *1.3 Research Questions*

The study was based on the following research questions:

- i. To what extent does internet banking have any effect on total deposits of deposit money banks in Nigeria?
- ii. To what extent does mobile banking has any effect on total deposits of deposit money banks in Nigeria?
- iii. To what extent does internet banking have any effect on total asset of deposit money banks in Nigeria?

- iv. To what extent does mobile banking has any effect on total asset of deposit money banks in Nigeria?

#### *1.4 Research Hypotheses*

For the purpose of analyzing the data, the following hypotheses were tested:

- H<sub>0</sub>1: There is no significant relationship between internet banking and total deposits of deposit money banks in Nigeria.  
H<sub>0</sub>2: There is no significant relationship between mobile banking and total deposits of deposit money banks in Nigeria.  
H<sub>0</sub>3: There is no significant relationship between internet banking and total asset of deposit money banks in Nigeria.  
H<sub>0</sub>4: There is no significant relationship between mobile banking and total asset of deposit money banks in Nigeria.

#### *1.5 Significance of the Study*

The study focuses on the effects of electronic banking on growth of deposit money banks in Nigeria. It is expected that the findings of the study will assist stakeholders in the banking sector ascertain whether the introduction of electronic banking has enhanced growth of deposit money banks in Nigeria or not. If the findings of this study reveal that electronic banking has not facilitated growth of deposit money banks in Nigeria, the study will recommend new strategy that banks should adopt in using electronic banking to impact positively on its growth. But, if the findings of the study show that electronic banking has contributed positively to the growth of deposit money banks in Nigeria, the study will still recommends measures that banks should employ in order to sustain the growth or even surpass it. The study will also come up with recommendations that will help stakeholders in the banking sector with new techniques to cop with e-banking challenges and meeting customers' needs which are essential for enhancing growth of deposit money banks in Nigeria.

A number of studies (Auta, 2010; Dogarawa, 2005; Siyanbola, 2013) have shown that electronic banking awareness is still very low, thereby hindering accelerated growth of deposit money banks in Nigeria. This study will also help the general public by creating awareness on the benefits of electronic banking. It is also hoped that the awareness that this study will create will drastically reduce cash handling, thereby reducing the cost of printing of cash, processing cost, storage cost, insurance cost and the cost of moving cash, which include theft and possible attacks by armed robbers.

The study will also serve as a useful reference material for students, academicians, institutions, corporate bodies and corporate managers who are interested in the subject of electronic banking. The findings of the study will also contribute to existing body of knowledge on e-banking and offer opportunity for further study into the area.

## **2. Literature Review**

A wide range of literature relating to electronic banking and growth were reviewed and discussed below:

### *2.1 The Concept of Electronic Banking*

Different authors have defined Electronic Banking in different ways based on their understanding of its application. E-banking is the term used for new age banking system and it is also called online banking (Auta, 2010). E-banking uses the internet as the delivery channel by which to conduct banking activities, for example, transferring funds, paying bills, viewing checking and savings account balances, paying mortgages and purchasing financial instruments and certificates of deposits (Mohammed, Siba & Sreekmar, 2009 cited in Auta, 2010). Electronic banking is the delivery of banking services and products through the use of electronic means irrespective of place, time and distance. Such products and services can include deposit-taking, lending, account management, the provision of financial advice, electronic bill payment, and the provision of other electronic payment products and services such as electronic money (Dogarawa, 2005). Electronic banking is also known as the automated delivery of new and traditional banking products and services directly to customers through electronic, interactive communication channels (Daniel, 1999; Sathye, 1999).

As has been pointed out by (Akinyele & Olorunleke, 2010), electronic banking means the provision of information about the bank and its product via a page on the internet. Izogo, Nnaemeka, Ezema and Onuoha (2012) citing Idowu (2011) assert that electronic banking is a means where by banking business is transacted using automated processes and electronic devices such as personal computers, telephones, fax machines, internet, card payments and other electronic channels.

### *2.2 Internet Banking*

Internet banking refers to systems that enable bank customers to get access to their accounts and general information on bank products and services through the use of bank's website, without the intervention or inconvenience of sending letters, faxes, original signatures and telephone confirmations (Thulani, Tofara &

Langton, 2009 cited in Yahiya, 2011). Siyanbola (2013) puts it that internet banking involves conducting banking transactions on the internet (www) using electronic tools such as the computer without visiting the banking hall. E-commerce is greatly facilitated by internet banking and is mostly used to effect payment. Internet banking like mobile banking also uses the electronic card infrastructure for executing payment instructions and final settlement of goods and services over the internet between the merchants and the customers. Commonly used internet banking transactions in Nigeria are settlement of commercial bills and purchase of air tickets through the websites of the merchants. Level of awareness of the advantages of this product to the saving populace is still very low; hence, there is every room for improvement if cashless banking would be effective as expected (Siyanbola, 2013). Funds transfer, airtime top up, balance enquiry, password change, bill payment etc can also be conducted on the internet banking platform.

### *2.3 Telephone Banking*

This is the most familiar of the tele-banking devices and it allows customers to transact banking business over the phone. It can be used as an alternative to the traditional branch banking or in conjunction with it (Stan, 1997 cited in Agboola, 2001). The customer can access their accounts using telephone lines as a link to the financial institutions computer centre. Services rendered here include account balance, transfer, change of pin etc. This product has also experienced low patronage due to inadequate awareness and education of the customer on how to maximally use their phone to transact simple banking operations (Siyanbola, 2013).

### *2.4 Mobile Banking*

This involves the use of mobile phone for settlement of financial transactions. This is more or less fund transfer process between customers with immediate availability of funds for the beneficiary. It uses card infrastructure for movement of payment instructions as well as secure SMS messaging for confirmation of receipts to the beneficiary. It is very popular and exciting to the customers given low infrastructure requirements and a rapidly increasing mobile phone penetration in the country. Services covered by this product include account enquiry; funds transfer; recharge phones; changing passwords, bill payments. Even though the product is exciting most customers are yet to fully buy into it in Nigeria, hence, both the apex bank and other banks still have a lot to do in terms of increasing awareness of the product to the saving populace in the country (Siyanbola, 2013).

### *2.5 Adoption of Electronic Banking*

There are a number of studies that suggest that customers' adoption of electronic banking may be related to a number of factors, some associated with the characteristics of the product or service and others associated with the characteristics of the customers (Balachandher, 2001; Lee & Lee, 2000; Kolodinsky, 2004; Olalekan, 2011). Technology Acceptance Model (TAM) is one of the most utilized models for studying IT acceptance (Al-Gahtani, 2001; Venkatesh & Davis, 1996; Davis, Bagozzi & Warshaw 1989 cited in Fonchamnyo, 2013). The TAM involves two primary predictors for the potential adopter- Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) of technology as the main determinants of the attitudes toward a new technology. PU is the degree to which a person believed that using a particular system would enhance his or her job performance; while PEOU is the degree to which a person believed that using a particular system would be free of effort (Davis, 1989 cited in Fonchamnyo, 2013).

Fonchamnyo (2013) revealed that perceived security, trust, cost of service, usefulness and accessibility have significant influence on customer's attitude and hence adoption of e-banking. Alagheband (2006) also revealed that perception of relative advantages, compatibility and trail ability of the service, cost of risk as well as gender and social character were found to influence the adoption of electronic banking services. Ayo, Adewoye and Oni (2010) showed that perceived ease of use and perceived usefulness are not only antecedent to e-banking acceptance, but also factors such as organizational reputation, perceived risk and trust contribute to the retention of customers to use e-banking system. Izogo et al. (2012) in their study Impact of Demographic Variables on Consumer's Adoption of E-banking in Nigeria revealed that while marital status, age and educational level influence the adoption of e-banking, the reverse is the case for demographic variables such as gender, religion and income. Howcroft, Hamilton and Heder (2002) found that the principal characteristics that inhibit online banking adoption are security and privacy. Durkin, Jennings, Mulholland and Worthington (2008) revealed that the simplicity of the products offered via internet banking facilitates the adoption of internet banking by consumers. The adoption of electronic banking depends on so many factors which include but not limited to level of education, income, age, ease of use, security, knowledge of product, perceived risk and trust.

### *2.6 Effects of Electronic Banking*

Numerous studies have shown that the introduction of electronic banking has brought remarkable improvement in the ways banking is conducted. For example, Ojokuku and Sajuyigbe (2012) in their study the impact of Electronic Banking on Human Resources Performance in the Nigerian Banking Industry revealed that the

introduction of electronic banking system in the Nigerian Banking Sector has helped tremendously in improving the productivity of bank personnel, leading to efficiency and effectiveness in service delivery. The study also found that the implementation of electronic banking system has boosted customer-relationship and customers' satisfaction. It is further asserted that electronic banking has improved banks employee performance, efficiency and bank-customer relationship resulting in customer satisfaction (Afolabi, 2009; Amedu, 2005; Yunus & Waidi, 2011). Electronic banking has made it possible for banks to get in touch with their customers easily, find out what their needs are and satisfying them effectively and efficiently at a lower cost. However, Dogarawa (2005) concluded that electronic banking in Nigeria is yet to create any significant impact on service delivery, which will consequently lead to improved customer satisfaction. This is in disagreement with the findings of studies stated above; this could be as a result of the fact that this other studies are conducted in later years' and the banks might have started exploiting the opportunities that electronic banking offers. Ekwueme, Egbunike and Amara (2012) posited that e-banking introduction in Nigeria had aid the operations of Nigerian banks through banks' employees productivity and general performance.

Dogarawa (2005) also revealed that electronic banking offer bank customers' services at a much lower cost and empowers them with unprecedented freedom in choosing vendors for their financial service need. Maiyaki and Mokhtar (2010) however, argued 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.

### *2.7 Determinant of Banking Growth*

The determinants of banking growth are generally explained in relation to saving and consumption theory. Banking growth is defined as deposit growth. Deposit growth being a major indicator of banking growth requires understanding of deposit as a major type of private saving as well as determinants of private savings behaviour. Masson, Bayoumi and Samiei (1998) cited in Kasri (2007) examined the determinants of private saving behaviour in 21 industrial countries and 40 developing countries from 1982 to 1993, and found that Gross Domestic Product (GDP) growth, GDP per capita, real interest rate and terms of trade are positively significant in determining the private saving behaviour in the developed countries. Loayza, Schmidt-Hebbel and Serven (2000) cited in Kasri (2007) studied 20 industrial and 49 developing countries during 1989- 1994 period, incorporating nine determinants of the private saving, namely income, rate of return uncertainty, domestic borrowing constraints, foreign borrowing constraints, financial depth, fiscal policy, pension system, demographics, and income and wealth distribution. The results suggest that private saving rates show inertia, in which the effects of a change in a given saving determinants are fully realized only after a number of years. The level of growth rate of GDP, inflation and fiscal policy affect the saving rate positively but with large degree of persistence. On the other hand, dependency ratio and financial liberalization show negative effect on private saving rates. The determinant effect of liberalization is evident from the fact that rising credit availability reduces the saving rate, while larger financial depth and higher real interest rate do not raise it.

Arthukorala and San (2004) in their study determinants of private saving behaviour in India use econometric to show that there is positive influence of real interest rate, the level and growth of per capita income, spread of banking facilities and the rate of inflation on domestic saving. Kasri (2007) study the determinants of Islamic banking growth in Indonesia and found that Islamic banking growth is significantly determined by the dynamics of real rate of return and real interest rate. Higher rate of return increases the industry's growth, while higher interest rate hinders its growth.

Bies (1971) identified increased in time deposit as one of the factors responsible for bank growth. She studied some banks in the US and found that from February 1970 to June 1971 all types of time deposit began to rise at faster rates, and both large and small commercial banks in the nation experience more rapid growth. Ghauri, Javaid and Ramzan (2012) in their study the determinants of growth of Islamic retail bank in Pakistan used expected deposit size, expected financing size and number of branches for the period 2008 to 2012 to show that Islamic retail banks in Pakistan are experiencing growth. Similarly, Kasri (2007) examined the determinants and causal relationships among the major determinants of growth, namely Mudharaba investment deposit, interest rate, rate of return, Islamic banks branches and income to study the determinants of Islamic banking growth in Indonesia.

### **3. Methodology**

The Ex-post factor research design was adopted for this study. This is similar to research design adopted by Hassan, Mamman and Farouk (2013). The population of the study consists of all deposit money banks in Nigeria. Secondary source of data was used for this study, and the data were sourced from Central Bank of Nigeria's annual reports and statistical bulletin. The study covers the period 2006- 2012. The period was considered appropriate because electronic banking full adoption in Nigeria started between 2003 and 2004, hence, the effect

can not be felt within few years of adoption.

The key variables of growth were measured in relation to deposit money banks in the study are deposit money banks' total deposits and total asset. This will constitute the dependent variables. While the independent variables of electronic banking that were measured are internet and mobile banking.

The technique of data analysis that was adopted for this study is inferential statistics. Multiple Regressions was used to find out whether relationship exists between electronic banking variables and growth variables identified in the study. If relationship exists, what is the nature of the relationship?

The total deposits ( $TD_t$ ) was regressed on internet banking ( $IB_t$ ) and mobile banking ( $MB_t$ ) using the researcher's model. The model is stated below:

$$TD_t = b_0 + b_1IB_t + b_2MB_t + e_t \quad (1)$$

Where  $TD_t$  = Value of total deposits at time t

$TA_t$  = Value of total asset at time t

$b_0$  = Intercept

$b_1, b_2$  = Parameters of regression model

$IB_t$  = Value of internet banking at time t

$MB_t$  = Value of mobile banking at time t

$e_t$  = Error Term

The total asset ( $TA_t$ ) was regressed on internet and mobile banking using the researcher's model as stated below:

$$TA_t = b_0 + b_1IB_t + b_2MB_t + e_t \quad (2)$$

The estimation of the coefficients of the models and interpretation were done using Eview version 7.1 in order to test the robustness of the models.

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#### 4. Results and Discussions

This section presents the results and discussion of the hypotheses tested.

##### 4.1 Test of Hypotheses

Secondary data was used in testing the study hypotheses. Information relating to internet banking, mobile banking, total deposits and total asset of deposit money banks in Nigeria for the period 2006- 2012 were gathered from CBN annual reports various years and 2013 statistical bulletin.

##### 4.1.1 Test of Hypotheses One and Two

Test of hypotheses one and two were done using multiple regression model generated from the secondary data sampled for the study.

The model is re-stated as follows:

$$TD_t = b_0 + b_1IB_t + b_2MB_t + e_t \quad (1)$$

The hypotheses are re-stated below:

**H<sub>01</sub>:** There is no significant relationship between internet banking and total deposits of deposit money banks in Nigeria.

**H<sub>02</sub>:** There is no significant relationship between mobile banking and total deposits of deposit money banks in Nigeria.

Table 1 revealed that the adjusted R<sup>2</sup> is 0.85, signifying that 85 per cent of variation in total deposits is explained or accounted for by internet and mobile banking. Thus, the goodness of fit embedded in the adjusted coefficient of determination shows that the estimated model has high predictive power. The table also revealed that the F-statistics is statistically significant, as confirmed by the P-value of 0.009557, this is a testimony of joint significant of estimated coefficient of internet and mobile banking.

The P-value of the Jarque-Bera (JB) statistic is 0.70, which is reasonably high, as such; we can not reject the null hypothesis of normality assumption. Similarly, table 2 shows that the ARCH Heteroskedasticity results were not statistically significant, implying that the null hypothesis of homoskedasticity is accepted.

Table 1 also revealed that the Durbin-Watson statistics of 2.097096 confirm non-auto correlation of random

variables. The DW statistics can vary between 0 and 4 with a value of 2 meaning that the residuals are uncorrelated (Field, 2009).

**Hypothesis One:** A linear negative relationship exists between internet banking and total deposits of deposit money banks in Nigeria as it is confirmed by the regression coefficient of -0.1427 in table 1. The t-statistic (-0.79) is not significant as shown by the P-value of 0.40 in table 1. This means that internet banking is not a strong predictor of total deposits of deposit money banks in Nigeria. The study therefore, fails to reject the null hypothesis and concludes that there is no significant relationship between internet banking and total deposits of deposit money banks in Nigeria. The implication of this result may be attributed to high incidence of internet fraud and the problem of internet connectivity which has eroded customers' trust and confidence in conducting transactions on internet banking platform.

**Hypothesis Two:** Table 1 shows that a linear positive relationship exists between mobile banking and a total deposit of deposit money banks in Nigeria as it is confirmed by the regression coefficient of 0.3997. Table 1 also shows that the t-value (4.108259) is highly statistically significant, as indicated by the P-value of 0.0148. This shows the importance of mobile banking in predicting total deposits of deposit money banks in Nigeria. The low standard error of 0.097298 as can be seen in table 1 in relation to 0.1999 (half value of the coefficient) confirms that the coefficients are not equal to zero. The study therefore, rejects the null hypothesis and concludes that there is positive relationship between mobile banking and total deposits of deposit money banks in Nigeria. The regression co-efficient is thus fitted as:

$$TD_t = 6.526 - 0.1427IB_t + 0.3997MB_t \quad (3)$$

#### 4.1.2 Test of Hypotheses Three and Four

Hypotheses three and four were tested using multiple regression model generated from the secondary data utilized in the study.

The model is restated as follows:

$$TA_t = b_0 + b_1IB_t + b_2MB_t + e_t \quad (2)$$

The hypotheses are re-stated below:

H<sub>03</sub>: There is no significant relationship between internet banking and total asset of deposit money banks in Nigeria.

H<sub>04</sub>: There is no significant relationship between mobile banking and total asset of deposit money banks in Nigeria.

Table 3 shows that 89 per cent of the variation in total asset of deposit money banks in Nigeria can be attributed to internet and mobile banking. The highly significant F-statistics with P-value of 0.005709 confirms that the co-efficient are jointly significant and not equal to zero. The DW statistics of 1.760355 confirm non-auto correlation of random variables. According to Swain (2008) if the residuals are not correlated, the DW statistics will be close to 2.

The P-value of Jacque-Bera (JB) statistics is (0.874133). This figure is highly non-significant, meaning that the null hypothesis of normality assumption can not be rejected.

Table 4 shows the ARCH Heteroskedasticity result, and the result suggests that there is no homoskedasticity. This is confirmed by the probability values of 0.1561 and 0.1074 which are not significant.

**Hypothesis Three:** Table 3 shows that there is positive linear relationship between internet banking and total asset of deposit money banks in Nigeria as it is confirmed by the positive regression coefficient of 0.2077. The t-statistics is statistically significant at 0.005709, which confirms the importance of internet banking in predicting total asset of deposit money banks in Nigeria. The low standard error of estimate (0.070866) in relation to half value of the coefficient (0.103867) confirms that the coefficients are not equal to zero. Therefore, the study rejects the null hypothesis and concludes that there is positive relationship between internet banking and total asset of deposit money banks in Nigeria.

**Hypothesis Four:** There is positive relationship between mobile banking and total asset of deposit money banks in Nigeria. This is confirmed by the regression coefficient of 0.0479 in table 3. The t-value of 1.242242 is not statistically significant as suggested by P-value of 0.2820 in table 3. The implication is that mobile banking is a weak predictor of total asset of deposit money banks in Nigeria. The study therefore, fails to reject the null hypothesis and concludes that there is no significant relationship between mobile banking and total asset of deposit money banks in Nigeria. Banks need to create more awareness and also modify their mobile banking application to accept all models of mobile phones. Perhaps, when this is done, it will increase the number of mobile banking customer base and subsequently, value of mobile banking transactions. The regression co-efficient is thus fitted as:

$$TA_t = 8.866 + 0.2077IB_t + 0.0479MB_t \quad (4)$$

## 5. Summary

This study examined the effects of electronic banking on growth of deposit money banks in Nigeria. Specifically, the study investigated internet banking; mobile banking; total deposits and total asset of entire deposit money banks in Nigeria for the period 2006- 2012. A total deposit was regressed on internet and mobile banking while total asset was regressed on internet and mobile banking using multiple regression models.

The introductory aspects of the study dwell more on the background to the study emphasizing the evolution of electronic banking, research problems; research objectives; research questions and research significance.

Many literatures and academic journal on electronic banking and growth were reviewed in the course of the study. Also, included in the areas that were reviewed are concept of e-banking, types of electronic banking, adoption of e-banking, effects of electronic banking and determinants of banking growth. The review of literature revealed that e-banking has the potentials to improve productivity, growth and profitability performance of banks due to low cost advantages associated with the delivery of e-banking services. The review also revealed that e-banking has enhanced bank- customer relationship resulting in customer satisfaction.

The study also revealed that there is significant relationship between mobile banking and total deposits, internet banking and total asset of deposit money banks in Nigeria. However, the study also revealed that there is no significant relationship between internet banking and total deposits, mobile banking and total asset of deposit money banks in Nigeria.

### 5.1 Conclusion

Based on the major findings the following conclusions are drawn:

E-banking has moderately improved the growth performance of deposit money banks in Nigeria. Although, positive relationship exists between mobile banking and total deposits, internet banking and total asset, internet and mobile banking are yet to make any significant improvement in total deposits and total asset growth performance of deposit money banks in Nigeria respectively.

E-banking has completely changed the way banking is conducted in Nigeria; it has brought a lot of numerous, convenience, flexible, efficient and interesting services to customers' at relatively lower cost. Customers can now check their balance; transfer funds; pay utility bills; view mini statement; order cheque, stop cheque, airtime top up etc. from the comfort of their bed room.

E-banking has improved bank-customer relationship. Internet and mobile phones has become common media of information used by banks in getting across to their customers. Monthly account statements are sent to customers via e-mails and mobile phones by banks free of charge.

E-banking has become a necessary selling point for deposit money banks in Nigeria. Banks that want to survive, grow and remain relevant must offer efficient services through e-banking.

### 5.2 Recommendations

Based on the conclusions of the study, the following recommendations are made for consideration by deposit money banks and regulatory bodies:

1. Banks that are yet to fully adopt electronic banking should as matter of urgency do so if they must grow, remain relevant, competitive and profitable.
2. Positive relationship exists between mobile banking and total deposits growth of deposit money banks in Nigeria. Therefore, banks that want to improve their deposit growth performance must offer numerous products/services through mobile phones in an effective, efficient and cost effective manner. They must also make mobile banking application all mobile phones enabled so that those customers who can not afford Java enabled mobile phones can also use the product.
3. Positive relationship also exists between internet banking and total asset growth of DMBs in Nigeria. Therefore, banks that want to increase their asset holdings must offer numerous, efficient and cost effective secured transactions through the internet. They must also ensure internet network availability at all times.
4. Aggressive e-banking awareness through all media of communication should be embarked upon by banks. The awareness should focus on the numerous e-banking products available and their benefits. The awareness campaign should also be extended to non-customers, since there are some e-banking products that do not require a customer to operate an account.
5. Banks should liaise frequently with their network providers to ensure that there is 24/7 network availability if e-banking adoption must be improved.
6. The Central Bank of Nigeria should ensure that all banks comply with the CBN guidelines on electronic banking. This will ensure that the problems of network unavailability, non-prompt resolution of dispense error issues and other operational challenges are overcome.
7. Banks should improve the security of e-banking transactions by securing their platforms and they

should also educate their customers on how to avert e-banking fraud.

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Table 1: Regression Results

| Variable              | Coefficient | Std. Error            | t-Statistic | Prob.    |
|-----------------------|-------------|-----------------------|-------------|----------|
| C                     | 6.526427    | 0.584823              | 11.15965    | 0.0004   |
| LOG(MOBILE_BANKING)   | 0.399726    | 0.097298              | 4.108259    | 0.0148   |
| LOG(INTERNET_BANKING) | -0.142688   | 0.178926              | -0.797470   | 0.4698   |
| R-squared             | 0.902241    | Mean dependent var    |             | 6.250858 |
| Adjusted R-squared    | 0.853362    | S.D. dependent var    |             | 0.848985 |
| S.E. of regression    | 0.325105    | Akaike info criterion |             | 0.888190 |
| Sum squared resid     | 0.422773    | Schwarz criterion     |             | 0.865009 |
| Log likelihood        | -0.108665   | Hannan-Quinn criter.  |             | 0.601673 |
| F-statistic           | 18.45852    | Durbin-Watson stat    |             | 2.097096 |
| Prob(F-statistic)     | 0.009557    |                       |             |          |

Source: Regression Output Using Eview 7.1

**Note:** Jarque-Bera (JB) is 0.71173 (0.700566)

Table 2: Heteroskedasticity Test: ARCH

|               |          |                     |        |
|---------------|----------|---------------------|--------|
| F-statistic   | 0.549863 | Prob. F(1,4)        | 0.4995 |
| Obs*R-squared | 0.725116 | Prob. Chi-Square(1) | 0.3945 |

Source: Regression Output Using Eview 7.1

Table 3: Regression Results

| Variable              | Coefficient | Std. Error            | t-Statistic | Prob.     |
|-----------------------|-------------|-----------------------|-------------|-----------|
| C                     | 8.865945    | 0.231625              | 38.27713    | 0.0000    |
| LOG(MOBILE_BANKING)   | 0.047875    | 0.038536              | 1.242342    | 0.2820    |
| LOG(INTERNET_BANKING) | 0.207734    | 0.070866              | 2.931380    | 0.0428    |
| R-squared             | 0.924444    | Mean dependent var    |             | 9.603952  |
| Adjusted R-squared    | 0.886667    | S.D. dependent var    |             | 0.382477  |
| S.E. of regression    | 0.128761    | Akaike info criterion |             | -0.964190 |
| Sum squared resid     | 0.066318    | Schwarz criterion     |             | -0.987371 |
| Log likelihood        | 6.374663    | Hannan-Quinn criter.  |             | -1.250707 |
| F-statistic           | 24.47058    | Durbin-Watson stat    |             | 1.760355  |
| Prob(F-statistic)     | 0.005709    |                       |             |           |

Source: Regression Output Using Eview 7.1

**Note:** Jarque-Bera (JB) is 0.269047 (0.874133)

Table 4: Heteroskedasticity Test: ARCH

|               |          |                     |        |
|---------------|----------|---------------------|--------|
| F-statistic   | 3.041603 | Prob. F(1,4)        | 0.1561 |
| Obs*R-squared | 2.591685 | Prob. Chi-Square(1) | 0.1074 |

**Source:** Regression Output Using Eview 7.1

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