# IMPACT OF ELECTRONIC BANKING ON THE FINANCIAL PERFORMANCE OF FIRST BANK OF NIGERIA PLC

*Adamu, Ramatu Muhammad* and Aminu Kabiru Sani***
* Department of Accountancy, Kano State Polytechnic.
**Department of Accountancy, Kaduna State Polytechnic, Kaduna

**Abstract**

*The transformation of banking activities from the traditional mode into electronic banking offers new opportunities for banks to improve their financial performance and operational efficiency. However, it also poses many challenges such as cost of innovation, application and overhead expenses associated with maintenance. The aim of this study therefore, is to evaluate the impact of Electronic Banking on the Financial Performance of First of Bank of Nigeria Plc. Secondary data was collected from the annual accounts and reports of First Bank from 1993 to 2007 with 7 years of pre electronic banking and 7 years of post electronic banking and the year 2000 serves as the base year. The data generated was analysed using the two paired sample t- tests in order to compare the pre and post electronic banking performance of the bank. The study concludes that electronic banking has no impact on profitability but has impact on the operational efficiency of the bank. Finally, the study recommends that the bank should create awareness programmes on its electronic banking products and services in order to attract more customers which in the long run will enhance their profitability and business activity.*

## Introduction

The advent of multiple computer applications and technology has changed the nature of financial services. The tremendous advances in technology and adoption of information technology had brought in a paradigm shift in banking operations all over the world. For the banks, technology has emerged as a strategic resource for achieving higher efficiency, control of operations, productivity and profitability. For customers, it is the realization of their 'anywhere and anytime' banking dream. This has prompted the banks to embrace technology to meet the increasing customer expectation and to face the tough competition in the banking industry. Shao (2007) noted that the banking operations have witnessed many changes within the last decades as a result of the progress recorded in information and communication technology. As significant participants in the market place, financial institutions are becoming more aggressive in adopting electronic banking capabilities. This makes the advent of the electronic banking to have a significant impact on banking services with the help of which, customers can make transactions anytime and anywhere as long as Internet access is available. The world is witnessing information and technological revolution, which has affected every aspect of people's life including banking. Such changes and developments have impacted on service quality and banking activities. Electronic banking, popularly referred to as e-banking represents a variety of different services, ranging from the common Automated Teller Machine (ATM) services and direct deposit to Automatic Bill Payment (ABP), Electronic Transfer of Funds (EFT) and Computer Banking (PC Banking) (Kolodinsky, Jim, Hogarth and Hilgert, 2004).

Moreover, banks are investing in information technologies as well as designing e-products in order to attract new customers and improve overall service quality. Alagheband (2006) opined that electronic banking services have provided numerous

benefits for both banks and their customers. The first benefit for the banks offering electronic banking services is better branding and better responsiveness to customers' needs. The main goal of every company is to maximise profits for its owners and banks are therefore not any exception. Automated electronic banking services offer a perfect opportunity for maximizing profits. On the other hand, the advantages for the customers are significant time saving, reduced costs in accessing and using banking products and services and increased ease and convenience.

Banks are heavily investing in information technology so as to attract new customers and improve overall service quality. As Goi (2005) noted, rapid advances in Information and Communication Technology has also significantly revolutionised the banking business, transforming processes as well as the strategic focus of banking institutions. Electronic banking has fully opened the doors for new business opportunities as well as offering new methods of delivery of banking products and services. Increased productivity and cutting of transaction costs are the most obvious benefits of e-banking. The dramatic difference in cost and speed between traditional 'brick-to-brick' banking and Internet-mediated financial 'brick-to-click' banking services and related information delivery has led to rapid growth of online payments, e-banking and online credit risk management, thus bringing about profound changes in the whole system of financial services and intermediation (Budd and Budd, 2007). With its related cost of development, improved efficiency and effectiveness, electronic banking is capable of affecting the profitability, operational efficiency and the value of banking organisations. Financial performance is an important moderator used to test hypothesis using different measurement strategies in order to establish if there are similarities between different financial performance measures across sub groups or whether different measures lead to different effects. Such financial performance measures include profitability, liquidity, efficiency, productivity and capitalisation (Dogarawa, 2006).

The development of information and network technologies has presented the banking industry with a huge growth opportunity. To realise this growth, banks need to seek an effective integration of information and network technologies with their traditional way of doing business (Xuebing and Weihua, 2001). Furthermore, the banking industry being the biggest and the most advanced user of computers and network technologies, and is one of the industries that is most suited to the era of networks. An intense use of electronic transfer of funds, cards and automated payment system generates a continuous transformation of banks operations requiring heavy investments in information technology.

This study examines the impact of electronic banking on the financial performance of First Bank of Nigeria PLC, using some additional variants of performance measurement other than profitability.

The questions here now are: what are the benefits of adoption of electronic banking in First Bank Nigeria PLC? Does electronic banking have a significant impact on the profitability of the bank? Does electronic banking have a significant impact on the operational efficiency of the bank? Is there any significant impact of electronic banking on the business activity of the bank?

The aim of this study is to evaluate the impact of electronic banking on the financial performance of First Bank of Nigeria PLC.

**The Concept of Electronic Banking**

Electronic banking can be defined as the conduct of banking business with the assistance of telecommunication and telecommunication based tools. Electronic banking also known as e-banking uses computers and electronic technology as a substitute for checks and other paper transactions. Dogarawa (2006) defined e-banking as 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.

Electronic banking includes several services like telephone banking, credit cards, debit cards, ATMs, internet banking, mobile banking and digital TV banking. Electronic banking is also known as electronic funds transfer (EFT) and basically is the use of electronic means to transfer funds directly from one account to another (Kareem, 2003).

The Federal Financial Institution Examination Council, in Alagheband (2006) described electronic banking as a variety of platforms such as internet banking (or online banking), telephone banking, TV based banking, mobile phone banking, and Personal Computer banking or (offline banking) whereby customers access these services using an intelligent electronic device, like a Personal Computer (PC), Personal Digital Assistance (PDA), Automated Teller Machine (ATM), Point Of Sale (POS), Kiosk or Touch tone telephone. Internet banking as part of electronic banking allows customers to perform a wide range of banking transactions via the bank's website, enabling users to perform common banking transactions, such as writing cheques, paying bills, transferring funds, printing statements and checking account balances online using a computer (Kagan, Acharya, Rao and Kodepaka, 2005).

The increased efficiency that results from paper based to electronic payment has reduced the amount of transactions required by customer. Consequently, the shift from full service banking offices to more specialized delivery channels will streamline banking services as well. With the rapid diffusion of the internet to all customer level, online banking is fast becoming an alternate channel to provide banking services and products. Bradley and Stewart (2003) as cited in Thulani, Tofara and Langton (2009) posited that, in the future, internet banking will continue to increase in importance as a strategic application and will become a competitive necessity that must be adopted by financial institutions to remain in the banking sector. Electronic banking therefore, is the automated delivery of new and traditional banking products and services through electronic interactive communication channels. It includes the systems that enable financial institutions, customers, individuals or businesses to access their accounts, transact business or obtain information on financial products and services through a public or private network, including the internet. It is the use of information and telecommunication devices in providing banking services.

**Development of Electronic Banking**

As observed by Chen (2001), the beginning of the second millennium would certainly be remembered by business historians as a time of unprecedented change in the business world. In the space of a few years, entire industries have been radically transformed, hundreds of thousands of new businesses have spawned and fortunes made and lost by digital technologies. Banking organisations have been delivering electronic services to consumers and businesses remotely for years. Electronic funds transfer, including small payments and corporate management systems as well as publicly accessible automated

machines for currency withdrawal and retail account management are global fixtures (Basel committee, 2001).

The history of electronic banking can be traced back to 1950, when the bank of America asked the Stanford Research Institute (SRI) to assess the possibility of developing electronic computers that could take over the labour intensive banking tasks of handling cheques and balancing accounts. The creation of branch offices and the rapidly increasing numbers of checks being used by a clientele threaten to overwhelm the existing manual processing (Stanford Research Institute, 2007). The revolution of the information technology in banking began in the early 1970s with the introduction of the Automated Teller Machine and credit cards, followed then by telephone, web and mobile.

The rapid expansion of Internet Banking is most noticeable in the developed countries such as the USA, Australia as well as European countries (UK, Germany, France, Norway, Denmark, etc.), where the availability and easy access to the internet has made it easier for banks to adopt Internet Banking (Jenkins, 2007 in Thulani, Tofara and Langon, 2009). Offering Electronic Banking services contributes to the overall image of the bank through the variety of services offered, accessibility of these services, enhanced level of security as perceived by the customers and its consistency with all the elements and actions that make up the reputation of the bank (Flavian, Casalo, and Guinaliu, 2007). Since the 1980s, commercial banking has continuously innovated through technology enhanced products and services such as multifunction ATM, telebanking, electronic transfers and electronic cash cards. Over the past decade, the internet has clearly played a critical role in providing online services and giving rise to a completely new channel (Wu, Hsia and Heng, 2006).

The trend continued with new developments and innovations on how to ease the work load in banks. The banking operations shifted gradually to electronic methods up to 1990s. On October 18, 1995, Security First Network Bank in the United States opened to the public world's first internet bank. The worldwide web with its ubiquities browser based access offered a completely different model for banking one in which customers could tap into their accounts to conduct transactions at any hour (Cronin, 1998). This is known as online banking which as Kelaart-Courtney (2003) defined is a growing part of e-commerce which provides interactive services such as accessing account summary information, paying bills and accessing other banking products and services. The success of informational and communication technologies was bigger in the inter-banking transactions. Since many of the operations that take place between banks are standardized, their digitalization proved to be easy. In time, the important banks have developed their own ICT departments, have devised advanced networks and brought the informational operations that used to be externalized in house (Octavian and Daniela, 2004).

Also, Delgado and Nieto in Hernando and Nieto (2006), added that the rapid development of the technology infrastructure, in particular, the growth in personal computers, the increased quality of internet connections, the more wide spread use of the internet in both homes and offices have made it possible for the internet to play a more central role in banks business strategy. The British Internet only bank, Egg, launched in October 1998 had by June 2001 signed over one million accounts with total assets of £7.9 billion. In a more matured financial market, the e-banking excitement is growing rapidly and the global acceptance has reinforced the speed of penetration.

Fox in Shao (2007), opines that under the impact of the new technologies, new types of banking services rose, the financial market became more fluid and more efficient, and the consumers were able to choose from a number of offers that often also come from other organisations than the banking ones. In spite of these advantages, online banking has not been equally adopted in all parts of the world. In the U.S., for example, 44% of all Internet users have been using some forms of online banking services. While in China only 14% of Internet users were reported to be using Internet banking.

Similarly, in Nigeria, Osineye (1999) pointed out that more banks are increasingly deploying and updating their information technology infrastructure, as a competitive tool. The need to provide banking services to their customers has been the main driver of significant information technology investments in banks in the past years. Other drivers have been globalisation, increased liberalisation and keener competition in Nigeria's financial system and the phenomenal growth of the internet which offers immense opportunities and challenges for banking. Deployment of these capabilities is impacting on the way banking business is conducted in addition to changing markets, products and customer relationship. The shape of banking generally is set to change in years ahead. "The hype of e-commerce, e-banking and e-everything is gradually being embraced by Nigerian financial institutions who are poised to be in the vanguard of narrowing the digital divide" (Ovia, 2001).

The Central Bank of Nigeria in its efforts to regulate the activities of Banks in the E-banking business set up a committee in 2003 to look into the likely impact of the movement towards electronic banking and payments on the achievement of CBN's core objectives. The findings and recommendations of the committee gave birth to four categories of guidelines to cover; information and communication technology standard to ensure that the technology deployed meet the needs of consumers, the economy and international best practice in the areas of communication, hardware, software, and security. The other guidelines include monetary policy, legal guidelines and regulatory/supervisory. The guidelines are to inform the future of conduct of financial institutions in e-banking and electronic payments delivery (CBN, 2003). Furthermore, in its survey on the extent of e-banking adoption by Nigerian banks, the Central Bank of Nigeria (CBN), in September 2002, found out that out of the 89 licensed banks that were operating in the country, only 17 were offering Internet Banking, 24 were offering basic telephone banking, 7 had ATM (Automated Teller Machines) services while 13 of the banks were offering other forms of e-banking. This implies that as of then, only 19.1 percent of the banks were offering Internet banking, signifying that Internet banking was yet to take centre stage despite its widely acclaimed benefits against the traditional branch banking practice (Ezeoha, 2005).

First Atlantic Bank Plc is said to have pioneered the real internet banking in 2003. Although in terms of automation, Societe Generale Bank Nigeria Ltd, All States Bank, First Bank of Nigeria, and City Bank Nigeria blazed the trail. Recently almost all banks operating in the country have already been connected to worldwide web for banking services and products as a proof of acceptance of electronic banking (Aminu, 2008).

Given the overwhelming success of electronic banking, banks in Nigeria are gradually embracing e- banking and radical changes are beginning to take place in Nigerian financial landscape. Today, all the twenty four mega banks are offering one form of electronic banking product/services or the other. Agboola (2006), Shokan (2005), Ovia (2005), Chen (2001), and Wenninger (2000) identified electronic banking product and

services to include; automated teller machines, point of sale transfers, electronic funds transfer, home banking (personal computer banking, electronic billing, electronic cash, telephone banking and electronic networks.

**The Benefits and Risks of Electronic Banking**

The breakthrough in technological development has today transformed the way and manner banks offer their products and services. Electronic banking services have provided numerous benefits for both banks and customers. Prescott (1998) asserted that properly applied technology can dramatically improve performance and reduce costs. The evolution of electronic banking has many advantages over traditional banking delivery channels.

Furthermore, the main (economic) argument for adopting electronic banking as a delivery channel is based on the expected reduction in overhead expenses made possible by reducing and ultimately eliminating physical branches and their associated costs such as staff and rent (Hernando and Nieto, 2006). Customers are not the only beneficiary of this new service. Making use of online banking, commercial banks may greatly increase the market coverage and better track customers as well. There are four popular efficiency measures used to assess Information System return, which are as follows: reduced operating expenses, increased profitability, increased fee income as percentage of total revenues and increased net-interest margin to average earning assets.

In essence, the impact of information technology on value creation in any organization happen either through increasing revenues at marginal cost, or through reducing costs at marginal changes in revenue, and thus enhancing operating profits. The issue of measuring the return on investment in information systems is being hotly debated in the Information System literature. The debate is growing also in the business community about the importance of measuring the return of investment in Information systems, since most of the benefits are derived from intangible and long terms investments (Mashhour and Zaatreh, 2008).

According to Agboola and Salawu (2008), another strategy considered by most managers for efficient time management to improve banking services and reduce the waiting time is the application of information and communication technology (ICT). Again most managers have come to terms with the reality of proper analysis of the queuing situation to determine the type, nature and extent of ICT products required for effectiveness and efficiency.

Budd and Budd (2007) are of the opinion that increased productivity and cutting of transaction costs are the most obvious benefits of e-banking. The dramatic difference in cost and speed between traditional 'brick-to-brick' banking and Internet-mediated financial 'brick-to-click' banking services and related information delivery has led to rapid growth of online payments, e-banking and online credit risk management, thus bringing about profound changes in the whole system of financial services and intermediation. Banks can now profit from these new opportunities by exploiting the competitive advantages that were not achievable by previous traditional banking methods.

In essence, the benefits of electronic banking have been identified by various researchers. However, the most prominent benefits according to Chen (2001), Fraser, Fraser and Macdonald (2000) and Kent and Lee (1999) are: lower operating costs, greater

geographic diversification, improved or sustained competitive positions and new revenue opportunities.

a. Lower Operating Costs: With the absence of customers in the banking hall, banks will require less staff to be in attendant which implies less staff operating costs, it reduce the cost of processing transaction and reduce overhead of branch network (Kent and Lee, 1999).

b. Greater Geographic Diversification: Electronic Banking with particular reference to on-line banking can be conducted anywhere in the world provided there is presence of the right technology. This implies that there is death of distance and time (Chen, 2001).

c. Improved or Sustained Competitive Positions: Under such changing banking business environment, banks have no choice but to provide excellent services to their customers. Credibility of a bank will determine public trusts on the bank. Under this stiffer competition era, it is the customer who holds the key. Customers are free to choose banks they trust. Good reputation, which supported by superior services, will become the most effective tool to win depositors funds (Fraser, Fraser and Macdonald, 2000).

d. New Revenue Opportunities: with wide range of products and services (electronic banking) banks are attracting new customers. This is because e-banking is becoming important in the eyes of customers in particular for certain segment of customers such as young professionals who feel more comfortable using e-banking to make transactions anywhere and anytime (Chen, 2001).

On the other hand, the risks associated with electronic banking as identified by Wenningers (2000) include strategic risks, operational risks and general risks. According to the Basle Committee, (1998), "Electronic banking has the potentials to transform the competitive landscape in banking and finance. One danger for banks is that they will be caught off guard by the changes, unable to anticipate new forms of competition or to respond to them in an appropriate manner. Because the potential for internet banking is still unknown, banks run the risk of either under or over reacting to these new sources of competition". This is referred to as strategic risks.

The other risk which banks face is the operational risks. Also, the Basle Committee, (1998) added that, "banks entry into the electronic market place brings with it increased exposure to technological failure. The success of banks effort to market products over the internet will depend on the continued smooth functioning of their computers and the underlying computer network. If individual computers fail, causing customer inconvenience, the reputation of individual banks may be damaged, if the network fails, a large amount of business may be lost. Banks could also suffer financial losses if hackers entered fraudulent over the internet will depend on the continued smooth function transactions that comprised bank systems, forcing the institutions to shut their systems down". Finally, there are other general risks which include Liquidity, interest rate, price market risk, compliance/legal risk and reputation risk (Wenningers, 2000).

**Empirical Studies on Electronic Banking**

Various studies have been conducted on electronic banking, online and internet banking in relation to its adoption by banks and customers, performance of these banks and the risks and benefits associated with it. Studies on the impact of electronic banking on financial performance are available for the US, European and Asian banking markets. Carlson, Furst, Lang and Nolle (2000), and Furst, Lang and Nolle (2000), investigated whether there is a link between offering internet banking and bank's profitability in the US. Carlson, Furst, Lang and Nolle, (2000) developed statistical models to explain why banks choose to adopt Internet banking and why some choose to offer a relatively wider array of Internet banking products and services. They also investigated whether offering Internet banking affects a bank's profitability.

The results revealed several significant differences in the profile of banks that offer Internet banking and those that do not. They observed that Internet banks rely more heavily in non-interest income and less on core deposits for funding than non-Internet banks do. In addition, the study revealed that Internet banks have better accounting efficiency ratio and higher returns on equity than non-Internet banks. To this end, they regressed Return on Equity against a set of control variables for banks that adopted internet as of quarter 3, 1999. Based on the results obtained, they conclude that internet banking was too small a factor to have affected bank profitability at that time. This conclusion was in line with the previous findings of Egland, Furst, Nolle and Robertson (1998) who found no evidence of major differences in performance of internet banks in the US.

However, the authors expressed two caveats: Firstly, the result may not hold for all the banks and, secondly, the result is open to change over time as the banks become more intensive in their use of the internet. These findings are also similar with those of Sathye (2005) for the credit unions in Australia for the year 1997 to 2001. He pointed out that internet banking has not proved to be a performance-enhancing tool in the context of major credit unions in Australia. Sullivan (2000) also found no systematic evidence that multichannel banks in the 10$^{th}$ Federal Reserve District were either helped or harmed by having transactional websites. Similarly, study on the impact of usability (user experience derived from the usability) of community banks' Web banking efforts, particularly homepages, on their performance through heuristic evaluation of their Web site homepages. The study revealed that Web banking activities have significant positive impact on the banks' return on assets (ROA) and return on equity (ROE) and improves the asset quality by identifying non performing loans. Furthermore, increasing Information Technology (IT) cost reduces ROA and ROE but improves loan quality. The results revealed that the impact of Web sites and Web banking applications on the banks' performance can be expected to become pronounced in the long run if these web sites are more usable for the masses because more usable web sites attract and retain more customers in the long run thereby increasing revenues, reducing customer support costs and increasing profits.

In a related study, Acharya, Kagan, Lingam and Gray (2008) adopted a unified measure of web usability using a number of relevant guidelines and then the estimated index was used to measure its impact on community bank performance. Results based on a multiple regression model show that banks with higher usability score perform significantly better than those with lower score. Similarly, De young, Lang and Nolle, (2006), invoke the theoretical concepts of product and process innovation and develop numerous testable conjectures about the financial and strategic implications of internet banking for US

community banks that adopted internet prior to 1999, comparing their financial performance over 1999-2001 to the performance of traditional community banks. Their results show that multichannel banks are somewhat more profitable, chiefly via increased non-interest income from deposit service charges.

Other studies have examined the financial performance of primarily internet banks that rely heavily, although not exclusively (e.g. telephone, ATM), on the internet as a delivery channel. De young (2005) identifies and estimates the magnitude of technology based scale effects of a dozen of primarily internet banks in the US over the 1997-2001 period. This author finds evidence of technology-based scale economies while the evidence on experience effects is rather weak. The empirical analysis demonstrates that profitability gaps with traditional banks of similar size and age shrink as primarily internet banks get larger. Kagan, Acharya, Rao and Kodepaka (2005) employed a structural equation model to examine whether the index explain differences in community bank performance. Their findings revealed that online banking helps community banks improve their earning ability as measured by return on equity and improve asset quality by reducing the proportion of overdue or underperforming assets. Similarly, DeYoung (2006) carried out a study on the financial performance of pure play internet banks using a small sample of six branchless banks and thrifts that distribute financial services exclusively through their websites. His findings revealed that the average pure play internet bank is less profitable than the average branching bank due to high labour cost, low non interest income and difficulty in attracting new customers.

In Europe, the majority of the studies have focused on the performance of primarily internet banks: those that most heavily, though not exclusively, rely on internet as a delivery channel. Hernando and Nieto (2006) studied 72 commercial banks operating in Spain over a period of 9years using regression analysis to determine Return on Asset, Return on Equity, Loans, Deposits, ICT costs and Marketing costs. Their results show that the impact on banks' performance takes time to appear. Costs reduction translates into improvement in banks' profitability, which becomes significant after one and half years in terms of ROA and after three years in terms of ROE. In a related study, Delgado and Nieto (2004) studied the performance of banking institutions in Spain and concluded that their negative aggregate profitability until 2002 was due to higher financial costs and lower fee income, which seemed to reflect the fierce competition among internet banks and between them and traditional banks in Spain. Delgado, Hernando and Nieto (2006) identified and estimated the magnitude of technology based scale and technology based learning economies of fifteen European internet banks. They conclude that the banks show strong evidence of technology based scale economies and their primary source seems to be the ability of primarily internet banks to control operational expenses even more efficiently than the traditional banks.

Similarly, the analysis of the performance of multichannel commercial banks (as opposed to traditional banks) has been the objectives of Hassan, Zazzara and Ciciretti (2005). These authors conclude that banks operating in Italy show a positive relationship between internet adoption and profitability (Return on Asset, Return on Equity) over the period 1993-2001 periods. In his own study, Siam (2006) investigated the role of electronic banking on the profits of Jordanian banks. He revealed that electronic banking has a negative effect on banks profitability in the short run due to costs and investments in electronic infrastructure and skilled manpower. In Nigeria, Dogarawa (2006) noted that the e-development is seriously impacting on performance of banks as it is affecting their productivity, efficiency, profitability, liquidity and capitalisation. It is also impacting on

customer satisfaction and banking operations as a whole. He assessed the impact of electronic banking in Nigerian banks with a sample of three banks using related T-test to compare profitability with Return on Equity, Average Operating Income and Return on Assets as variables over a period of six years. The study finds that electronic banking has very little or no significant impact on the profitability of Nigerian banks.

The evidence of the impact of the adoption of electronic banking as a delivery channel on performance is mixed at both sides of the Atlantic. It can be argued that as the intensity and experience in the usage of electronic banking increases, the financial performance of multichannel banks is likely to improve. In Nigerian context, many publications throw light over the importance of electronic banking and also its prospects for the Nigerian banking industry. However these studies don't depict any empirical relationship between banks' financial performance and electronic banking. In conclusion, the impact of electronic banking on the financial performance of banks can be seen to be insignificant especially in the short run due to high costs of investment in Information and Communication Technology (Egland, Furst, Nolle and Robertson, 1999; Furst, Lang and Nolle, 2000; Sullivan, 2000; Degaldo and Nieto, 2004; Sathye, 2005; De Young, 2006; Dogarawa, 2006; and Siam, 2006).

However, latest studies seem to find a positive relationship with profitability. The impact of electronic banking on financial performance is likely to improve in the long run as banks are deploying more electronic banking products and services that will attract even more customers, reduce staff costs and general expenses as a whole (Lingam, 2004; Hassan, Zazzara and Ciciretti, 2005; De Young, Lang and Nolle, 2006; Hernando and Nieto, 2006; Nelson and Richmond, 2007; and Acharya, Kagan, Lingam and Gray, 2008).

Also, in spite of the conspicuous use of this new delivery channel, there are few studies worldwide on the impact of electronic banking on banks performance. A number of studies have been conducted on electronic banking in the recent past both in the developed and the developing countries of the world. However, most of them paid attention to online/internet banking. Studies on the impact of electronic banking on performance, although scarce, are available in the United States of America, European and Asian banking sectors (Sullivan, 2000; Furst, Lang and Nolle, 2002; Lingam, 2004; Sathye, 2005; Hernando and Nieto 2006; Siam, 2006; De Young, Lang and Nolle, 2006; Nelson and Richmond, 2007 and Kagan, Acharya, Lingam and Gray, 2008). Even though some studies have been conducted on banks and electronic banking products and services in Nigeria, most of them focused on the deployment of electronic banking capabilities, benefits and risks of electronic banking and their effect on customer satisfaction, operational efficiency and the impact of electronic banking on the Nigerian economy (Osineye,1999; Umoren, 2000 Orume, 2002; Fagbuyi, 2003; Ashaolu, 2004; Bamidele, 2005; James and Tijjani, 2005; and Agboola, 2006).

However, Dogarawa (2006) conducted a study on the impact of electronic banking on the profitability of Nigerian banks. His findings revealed that electronic banking has little or no significant impact on profitability of Nigerian banks. These previous studies paid little or no attention on the impact of electronic banking on the financial performance of Nigerian banks

**Methodology**

The study adopts a non survey method in data collection for analysis. Data will be sourced from secondary documents which will be obtained from annual reports and accounts of First Bank of Nigeria Plc and the fact book of the Nigerian stock exchange. The pre electronic banking and post electronic banking averages for a set of key financial ratios is computed for 7 years prior to e- banking and 7 years after, from 1993-2007. The base year is the year 2000, which is to be denoted as O. The post Electronic Banking performance is compared with the pre Electronic Banking performance and tested for significant differences. Average Pre and Post Electronic Banking is compared to see if there is any statistically significant change in Performance due to Electronic Banking by using Paired two sample t- test at confidence level of 0.05.

The t–test formula is given by:

$$t = \frac{d}{sd/\sqrt{n}}$$

Where

d = the average difference between the paired observations.

sd = the standard deviation of the difference between the paired observations.

n = the number of paired observations.

**Results and Discussion**

This section presents the results of the t-tests.

Table 1: Impact of Electronic Banking on Return on Equity

| | Pre electronic banking | Post electronic banking |
|---|---|---|
| Mean | 0.24 | 0.28 |
| Variance | 0.0073 | 0.0037 |
| Observations | 7 | 7 |
| Pearson Correlation | -0.57 | |
| Hypothesized Mean Difference | 0 | |
| Df | 6 | |
| t Stat | 0.81 | |
| P(T<=t) two-tail | 0.44 | |
| t Critical two-tail | 2.44 | |

Source: Generated by the Reseacher Using Excel 2010

With reference to table 1, the positive t-statistic is less than the positive t-critical (0.81<2.44) at 5% level of significance. This result is in line with the findings of Egland, Furst, Nolle and Robertson (1998), Carlson, Furst, Lang and Nolle (2000), Degaldo and Nieto (2004), Deyoung (2005) and Dogarawa (2006), who concluded that electronic banking does not have a significant impact on return on equity of banks. These findings are in contrast with that of Kagan, Acharya, Rao and Kodepaka (2005), whose results reveal that electronic banking has a significant impact on ROE.

Table2: Paired two sample for means on the impact of Electronic Banking on Return on Assets

| | Pre electronic banking | Post electronic Banking |
|---|---|---|
| Mean | 0.02 | 0.03 |
| Variance | 6.75 | 8.44 |
| Observations | 7 | 7 |
| Pearson Correlation | -0.55 | |
| Hypothesized Mean Difference | 0 | |
| Df | 6 | |
| t Stat | 1.17 | |
| P(T<=t) two-tail | 0.28 | |
| t Critical two-tail | 2.44 | |

Source: Generated by the Reseacher Using Excel 2010

With reference to table 2, the positive t-statistic is less than the positive t-critical (1.17<2.44) at 5% level of significance. Therefore, the researcher accepts the null hypothesis. This result is in line with the findings of Egland, Furst, Nolle and Robertson (1998),Carlson, Furst, Lang and Nolle (2000), Degaldo and Nieto (2004), Deyoung (2005) and Dogarawa (2006), who concluded that electronic banking does not have a significant impact on return on assets of banks. However, Kagan, Acharya, Rao and Kodepaka (2005) , found a positive relationship between electronic banking and the ROA of banks.

Table 3: Impact of Electronic Banking on Overhead Expenses

| | | |
|---|---|---|
| | Pre electronic banking | Post electronic banking |
| Mean | 0.06 | 0.05 |
| Variance | 0.0002 | 3.3333 |
| Observations | 7 | 7 |
| Pearson Correlation | -0.18 | |
| Hypothesized Mean Difference | 0 | |
| Df | 6 | |
| t Stat | -2.52 | |
| P(T<=t) two-tail | 0.04 | |
| t Critical two-tail | 2.44 | |

Source: Generated by the Reseacher Using Excel 2010

Refer to table 3, the negative t-statistic is more than the negative t-critical (-2.52>-2.44) at 5% level of significance. Therefore, the researcher rejects the null hypothesis. This result is in line with the findings of Hernando and Nieto (2006), Lingam (2004) and Siam (2006), who concluded that electronic banking has a significant on overhead expenses of banks they have studied. These findings are in contrast with the results of Deyoung (2006) and that of Egland, Furst, Nolle and Robertson (1998), whose findings reveal that electronic banking has no significant impact on the overhead expenses of banks.

Table 4: Impact of Electronic Banking on Staff Costs

| | Pre electronic banking | Post electronic Banking |
|---|---|---|
| Mean | 0.03 | 0.01 |
| Variance | 0.0001 | 1.42857 |
| Observations | 7 | 7 |
| Pearson Correlation | 0.28 | |
| Hypothesized Mean Difference | 0 | |
| Df | 6 | |
| t Stat | - 4.14 | |
| P(T<=t) two-tail | 0.006 | |
| t Critical two-tail | 2.44 | |

Source: Generated by the Reseacher Using Excel 2010

Refer to table 4, the negative t-statistic is more than the negative t-critical (- 4.14>-2.44) at 5% level of significance. Therefore, the researcher rejects the null hypothesis. This result is in line with the findings of Hernando and Nieto (2006), Lingam (2004) and Siam (2006), who concluded that electronic banking has a significant impact on the staff costs of banks. However, Deyoung (2006) and Egland, Furst, Nolle and Robertson (1998) in their studies found no significant impact of electronic banking on the staff costs of the banks they have studied.

Table 5: Impact of Electronic Banking on Deposits

| | Pre electronic banking | Post electronic banking |
|---|---|---|
| Mean | 0.70 | 0.68 |
| Variance | 0.0010 | 0.0027 |
| Observations | 7 | 7 |
| Pearson Correlation | -0.46 | |
| Hypothesized Mean Difference | 0 | |
| Df | 6 | |
| t Stat | - 0.61 | |
| P(T<=t) two-tail | 0.55 | |
| t Critical two-tail | 2.44 | |

Source: Generated by the Reseacher Using Excel 2010

Refer to table 5, the negative t-statistic is less than the negative t-critical (-0.61 <-2.44) at 5% level of significance. Therefore, the researcher accepts the null hypothesis. This result is in line with the findings of Hernando and Nieto (2006), Lingam (2004), Hassan Zazzara and Ciciretti (2005) and Siam (2006), who concluded that electronic banking has no significant impact on the deposit activity of banks. These findings are in contrast with the findings of Deyoung, Lang and Nolle (2006) and Degaldo, Hernando and Nieto (2006) whose results reveal a significant impact of electronic banking on deposit activity of the banks they have studied.

Table 6: Paired two sample for means on the impact of Electronic Banking on Loans

| | Pre electronic banking | Post electronic banking |
|---|---|---|
| Mean | 0.21 | 0.25 |
| Variance | 0.0026 | 0.0029 |
| Observations | 7 | 7 |
| Pearson Correlation | 0.75 | |
| Hypothesized Mean Difference | 0 | |
| Df | 6 | |
| t Stat | 2.91 | |
| P(T<=t) two-tail | 0.02 | |
| t Critical two-tail | 2.44 | |

Source: Generated by the Reseacher Using Excel 2010

Refer to table 6 the t-statistic is greater than the t-critical (2.91 > 2.44) at 5% level of significance. Therefore, the researcher rejects the null hypothesis. This result is in line with the findings of Lingam (2004), Hassan Zazzara and Ciciretti (2005), Siam (2006) and Hernando and Nieto (2006), who concluded that electronic banking has a significant impact on the loan activity of banks. However, Lingam (2004) found no significant impact of electronic banking on the loan activity of banks especially in the short run.

**Conclusion and Recommendations**

Based on the major findings of the study, the following conclusions are drawn:

1. The electronic banking delivery channel serve as complementary means of transacting with customers rather than a substitute for traditional banking. Despite the large investments in electronic banking products and services, the brick and mortar branch remains an important channel for retail banking products in First Bank of Nigeria PLC. The substitution of traditional banking delivery channels with electronic ones clearly offers more opportunities for banks. In addition to creating value, the provision of online services can lead to more costs savings and customer attraction for the Bank.

2. First Bank still provides traditional electronic services such as ATM, and Master card, whereas the Internet is still not widely used as a substitute for branch banking by majority of the bank's customers. Instead of focusing on creating more virtual branches, physical branches are still being created which will in the long run increase overhead expenses and staff costs.

3. The adoption of electronic banking has no significant impact on the profitability of First Bank of Nig Plc. There is evidence of non-significant positive impact on performance, both in terms of ROE and ROA. The adoption and full utilisation of electronic banking products and services can lead to costs savings which will in the long run improve efficiency and profitability of the bank.

4. The operational efficiency gains associated with the adoption of electronic banking products and services are mainly explained by a significant reduction in overhead expenses and staff costs of the Bank.

5. The reduction of staff costs and overhead expenses show that the Bank presents statistically significant evidence of efficiency gains (i.e. reduction in general expenses per unit of output). The bank would further profit from these cost reductions to the extent that the electronic delivery channel functions as a substitute for traditional distribution channels.

6. There is no improvement in the business activity of the Bank as electronic banking has no significant impact on the deposit activity of the Bank. There is no doubt that fraud and pilferages discourage customers from using electronic banking products and services. The security risks associated in electronic are inherent in use of ATMs and online transactions.

Based on the conclusions of the study, the following recommendations are made:

1. There is the need for the bank to expand its provision of electronic products and services especially rolling out more attractive products such as point of sales transfer and electronic cash which will increase the number of customers and enhance their loyalty to the bank.

2. The bank should focus on opening more virtual branches that will reach potential customers in their homes and offices. The money used for building physical branches can be channelled to the provision of electronic banking products and services that can reach millions of customers anywhere and anytime. This will consequently lead to further reduction in staff costs and overhead expenses.

3. There is the need for the bank to educate its customers on the use of internet banking and other related services which will increase banking transactions through Internet and consequently the reduction of branch banking. The bank should educate customers and carry out awareness and promotion campaigns on the advantages and feasibility of electronic banking products and services which in the long run will lead to more reduction in the operational cost and improvements in profits.

4. The bank should hold training courses for its employees to enable them understand electronic banking business in order to achieve the desired objectives. Also, the bank should create the environment that will encourage customers to hook up electronically by providing special loans to enable them acquire personal computers and internet connectivity. The loan is to be payable through small monthly deductions from the customers accounts, which will serve as another strategy for improving the business activity of the bank.

5. The bank is also required to set up appropriate measures that will prevent fraud and other irregularities related to electronic banking. It should ensure safety of transactions conducted on-line and the ATMs among others. All electronic banking systems should be constructed to ensure that they interact with a valid authorisation base. Also, and sufficient audit trails should exist to document any such tampering.

**References**


Acharya, R.N; Kagan, A; Lingam, S.R. & Gray, K. (2008). Impact of website usability on performance: A Heuristic Evaluation of Community Bank Home Page Implementation, *Journal of Business and Economics Research Vol.6, No.6 Pp 139-148.*

Agboola, A.A and Salawu, R.O (2008). Optimizing the Use of Information and Communication Technology (ICT) By Nigerian Banks. *Journal of Internet Banking and Commerce. April 2008, Vol. 13, No.1* http://www.arraydev.com/commerce/jibc (Retrieved 12/09/2009)

Agboola, A.A. (2006). Electronic payment system and tele-banking services in Nigeria. *Journal of Internet Banking and Commerce. Dec 2006, Vol. 11, No.3* http://www.arraydev.com/commerce/jibc( Retrieved 19/08/2008)

Alagheband, P. (2006). 'Adoption of Electronic Banking by Iranian Customers'. Master's Thesis, Lulea University of Technology, Dept of Marketing and Commerce.

Aminu, A. (2008). Electronic Banking; The Thrills, The Frills. www.thisdayonline.com (Retrieved 17/06/2008)

Ashaolu, A. (2004). Roadmap to Seamless E-Banking. *The Guardian Newspaper, January 28, 2004.*

Bamidele, A. (2005). The Imperative of E-banking for Monetary Policy in Nigeria. *CBN Economic and Financial Review. March, Vol.43,No.1 pp1-21.*

Barnes, P. (1987). The Analysis and Use of Financial Ratio: a review article. *Journal of Business, Finance & Accounting, Vol. 14: pp 449-461.*

Basle Committee (1998). Risk Management for Electronic Banking and Electronic Money Activities. Basle Committee on Banking Supervision

Basle Committee (2001). Risk Management; Principles for Electronic Banking. Basle Committee on Banking Supervision.

Budd, B. and Budd, D. (2007). A Preliminary Empirical Investigation of Bricks to Click Banking Presence in United Arab Emirates. *Journal of Internet Banking and Commerce. Aug 2007, Vol.12, No2.* http://www.arraydev.com/commerce/jibc (Retrieved 11/07/2009)

Carlson, J., Furst, K., Lang, W. and Nolle, D. (2000). Internet Banking: Markets Developments and Regulatory Issues, Economic and Policy Analysis Working Papers, 2000-9, Office of the Comptroller of the Currency.

Central Bank of Nigeria (2003). Guidelines on Electronic Banking in Nigeria.

Central Bank of Nigeria (2007). Electronic Report for the First Half of 2007.

Chen, S (2001). *Strategic Management of E-Business.* England; John Wiley & Sons Ltd.

Cronin, M. (1998). *Banking and Finance on the Internet.* Canada: John Wiley And Sons.

Delgado, J. and Nieto, M. J. (2004). Internet Banking In Spain, Some Stylized Facts, Monetary Integration, Market and Regulation. *Research in Banking and Finance. Vol. 4 Pp-187-209*

Delgado, J., Hernando, I. & Nieto, M. J. (2006). Do European Primarily Internet Banks Show Scale and Experience Efficiencies? *European Financial Management.*

Deyoung, R. (2005). The Performance of Internet-Based Business Models: Evidence From the Banking Industry. *Journal of Business, Vol.78, No.3, Pp. 893-947.*

Deyoung, R. (2006). *The Financial Performance of Pure Play Internet Banks.* Federal Reserve Bank of Chicago USA.

Deyoung, R., Lang, W. and Nolle, D. (2006). How The Internet affects Output and Performance at Community Banks, Unpublished Manuscript.

Egland, K. L., Furst, K., Nolle, D. and Robertson, D. (1998). Banking Over the Internet *Office of The Comptroller of the Currency Quarterly Journal, 17 (4), December.*

Ezeoha, A.E. (2005). Regulating Internet Banking in Nigeria: Problems and Challenges.Partl,*JournalOfInternetBankingAndFinance.Vol.10.No3.Http:www.Arraydev.Com/Commerce/Jibc. (23/09/2008)*

Fagbuyi, T. (2003). New security Requirements for E-Banking System. *Business Times, August 25-31.p.31.*

First Bank of Nigeria Plc (1993-2009). Annual Report and Accounts.

Flavian, C. Casalo, L. And Guinaliu, M. (2007). *Successful Relationship in E- Banking Business.* Mguinaliu.Files.Wordpress.Com

Fraser, J., Fraser, N. and McDonald, F. (2000). The Strategic Challenge of Electronic Commerce Supply and Management. *An International Journal, Vol. 5 No1, Pp 7-14.*

Furst, K., Lang, W. and Nolle, D. (2002). Internet Banking: Development and Prospects. Economic and Policy analysis Working Paper 2000-9. Office of the Controller of the Currency.

Goi, C.L (2005). E-Banking in Malaysia: Opportunity and Challenges. *Journal of Internet Banking and Commerce, Dec 2005, Vol.10 No.3. http://www.arraydev.com/commerce/jibc (Retrieved 11/06/2008)*

Hasan, I., Zazzara, C. and Ciciretti, R. (2005). Internet, Innovation and Performance of Banks: Italian Experience (Unpublished Manuscript).

Hernando, I. and Nieto, J.M (2006). Is Internet Delivery Channel Changing Banks Performance? A Case of Spanish Banks. *Banco De espanoWorking Paper Series.*

Hirtle, B. (2005). The Impact of Network Size on Bank Branch Performance. Federal Reserve Bank of Newyork, Staff Reports No.211.

James I.O and Tijjani, B (2005). An Empirical Assessment of the Operational Efficiency of Electronic Banking in Nigeria. *Bayero International Journal of Accounting Research Vol.1, No 2 Page 32-41.*

Kagan, A. Acharya, R.N., Rao, L.S and Kodepaka, V. (2005). Does Internet Banking Affect the Performance of Community Banks. Paper Presented at the American Agricultural Economics Association Annual Meeting Providence, Rhoda Island.

Kareem, K. (2003). Internet Banking in Estonia. *Raxis Centre for Policy Studies*Pp 11-12

Kellart-Courtney, G. (2003). Internet Banking: When You Thought it was Safe. *http://www.itponet/features/details. (Retrieved 15/07/2008)*

Kent, R. and Lee, M. (1999). Using the Internet for Market Research; A Study of Private Trading on the Internet. *Journal of Market Research Society, London, Vol. 41 Issue 4. Pp 377-382.*

Kolodinsky, J., Hogarth, J.M. and Hilgert, M.A (2004). The Adoption of Electronic Banking Technologies by US Consumers." *International Journal of Bank Marketing Vol.22, No.4, Pp 238-259.*

Mashhsur, A. and Zaatreh, Z. (2008). A Framework for Evaluating the Effectiveness of Information Systems at Jordan Banks: An Empirical Study. *Journal of Internet Banking and Commerce. April 2008, Vol. 13, No.1. (http://www.arraydev.com/commerce/jibc (Retreived 12/07/2009)*

Octavian, D and Daniela, R. (2004). *The Adoption of Electronic Banking Service in Developing Countries- The Romanian Case,* Grant Td 122 Cncsis Romania.

Osineye, S. B. (1999). Deploying Electronic Capabilities in Banks. *First Bank Monthly Business and Economic Report, Nov-Dec, 1999. Pp 10-16.*

Ovia, J (2001). Internet Banking: Practices and Potentials in Nigeria. *The Institute of Chartered Accountants of Nigeria.*

Ovia, J. (2005). Enhancing the Efficiency of the Payment System. *The Bullion, A CBN Publication Vol. 29, No 1 Pp 8-20.*

Prescott B.D. (1998). *Creating a World Class Organization. Ten Performance Measures for Business Success* 2nd Edition. London. Kogar Page Ltd.

Sathye, M. (2005). The Impact of Internet Banking on Performance and Risk Profile: Evidence from Australian Credit Unions. *Journal of Banking Regulation, Vol. 6, Pp. 163-174.*

Shao, G. (2007). The Diffusion On Online Banking: Research Trends Form 1998-2006'' *Journal Of Internet Banking And Commerce, Aug 2007, Vol.12, No2. http://www.arraydev.com/commerce/jibc (Retrieved 11/06/2009)*

Siam, A. Z. (2006). Role of Electronic Banking Services and the Profits of Jordanian Banks. *American Journal of Applied Science Vol.3, No. 9. Pp 1999-2004.*

Stanford Research Institute (2007). The Origin of Electronic Banking. www.sri.com (Retrieved 12/08/2008)

Sullivan, R. J. (2000). How has the Adoption of Internet Banking Affected Performance and Risk in Banks? A Look at Internet Banking in the 10th Federal Reserve District''. Federal Reserve Bank of Kansas City Financial Industry Perspectives. Pp. 1-16.

Thulani, D. Tofara, D. And Langon R. (2009). Adoption and Use of Internet Banking in Zimbabwe: An Exploratory Study. *Journal of Internet Banking and Commerce. April 2009, Vol.14, No.1. http://www.arraydev.com/commerce/jibc (Retrieved 11/06/09)*

Umoren, R. (2000). Losing with E-banking. *First Bank Monthly Business and Economic Report. Nov, 2000. Pp 14-18.*

Wenniger, J (2000). The Emerging Role of Banks in E- Commerce. *Current Issues In Economic and Finance, Vol. 6, No 3.Pp1-6.*

Wu, J. Hsia, T. And Heng, M. (2006). Core Dynamic Capabilities of Exploiting Electronic Banking. *Journal of Electronic Commerce Research. Vol. 7, No. 2. Pp 111-122.*

Xeubing, W and Weihua, M (2001). E- Banking; Strategic Choice for Modern Banks. People's Daily. http;//english.peopledaily.com.cn. (Retrieved 22/05/2008)