CHAPTER ONE

INTRODUCTION

1.1   Background to the Study

Information plays prominent role in human life. The progress recorded in science and technology has immeasurably increased the role of information in every facet of human endeavour. The rapid expansion of a mass of diversified information has born the term "information explosion" and gave rise to a scientific approach in information and elucidation of its most characteristic properties. This has led to principal changes in interpretation of the concept of information. The term information has now been broadened to include exchange not only among men but also among machines as well as the exchange of signals in the animal and plant worlds. The pace of change brought by new technologies has had a significant effect on the way people live, work, and play globally (Obasan, 2011).

The application of Information and Communication Technology (ICT), which basically involves the use of electronic gadgets especially computers for storing, analyzing and distributing data, is having a dramatic influence on almost all aspects of individual lives and that of

the national economy- the banking sector inclusive. The increasing use of ICT has allowed for the integration of different economic units in a spectacular way. This phenomenon is not only applicable to Nigeria but to other economies of the world, though the level of their usage may differ among countries (Osabuohien, 2008).

The use of ICT in the banking sector is of interest due to the significant role banks plays in the economy. The banking sector helps in stimulating economic growth by directing funds to economic agents that need them for productive activities. This function is very vital for any economy that intends to achieve meaningful growth because it facilitates interfacing among borrowers and lenders of financial resource in a more efficient way than if they had to relate directly with one another (Adam, 1998; Ojo, 2007). In essence, the banking sector acts as a bridge that connects lenders and investors in the economy.Information and communication technology (ICT) has in particular brought a complete paradigm shift on banks' performance and on customer service delivery in the banking industry. In a bid to catch up with global development, improve the quality of customer service delivery, and reduce transaction cost, banks have invested

heavily in ICT, and have widely adopted ICT networks for delivering a wide range of value adding products and services. The ICT development has a significant effect on development of more flexible and user friendly banking services (Abubakar&Rosmaini, 2012).

Information and communication technology has now become the heartbeat ofthebanking sector, while the banking industry is the center-pin heart of every robust economy. If it collapses so will theeconomy; this was evident from the past hip-cups Nigerian banks experienced. ICT has created a new infrastructure for the world economy to become truly global and provided the users of new technology a competitive advantage over their rivals. Electronic banking system has now become the main technology driven revolution in conducting financial transactions. However, banks have made huge investments in telecommunication and electronic systems, users have also been validated to accept electronic banking system as useful and easy to use (Adesina& Ayo, 2010).

Technology innovation has influenced the performance of all Nigerian banks. In the last ten years, tremendous achievements were recorded inbanks' networking, service delivery, profitability

andcustomers' responses. Employees have been made tocope with the demands of information andcommunication technologies (ICT) which now dominate the globalbanking industry. Customers have also benefited fromimproved networking and service delivery whichinevitably improved banks competitiveness andprofitability. Despite these achievements, Nigerianbanks have witnessed severe downturn in their performanceand many of them have almost collapsed (Dauda&Akingbade, 2011).

Technological innovation rests on the creative abilityof human being. Man has the capacity to use hisknowledge to create new machines process andmethod that could enhance or improve the quality ofgoods and services. Innovation is required for man tosatisfy his changing needs and cope with the demandof the changing and dynamic environment. Innovation facilitates the emergence of theunusual, the uncommon, the novel andhighquality, ideas and products, which enable man tosatisfy his needs despite his changing condition andrequirements. Technology innovation is the changesin technology that can significantly improve organizational performance, improve its

processesandpromote its service delivery system beyond the stateof the art to produce quality goods and services(Taylor, 1993).

Castells (2001) reveals that, with ICT, transactions worth billions of dollars can take place in seconds in the electronic circuit throughout the globe by pressing a single butting. Although, ICT has revolutionized the way of living as well as conducting businesses; but banking industry has received increased attention over the last decade, and it continues to pose challenges for marketers and academic alike. According to Loonam and O'Loughlin (2008), ICT advances, globalization, competition and changing social trends which have heightened customers' pro-activeness and increased preferences for convenience have also led to intense restructuring in the banking industry.Information and Communication Technology (ICT) has now been acceptedas one of the main driving force behind organizational competitiveness in thepresent day business environment. Presently, ICT is having dramaticinfluence on almost all facets of human activities.One of the areas ofeconomic activities in which this influence is most manifest is the bankingsector. The banking industry is one of the critical sectors of the economywhich makes invaluable

contributions to the pace of economic growth anddevelopment of nations.

There is no gainsaying the fact that globalization has brought about intensecompetition in the financial services industry which necessitates that thosefirms in this industry operate at their best. To remain competitive, firmsneedto be flexible to be able to respond rapidly to the fast changing marketenvironment to which they are exposed. Actually, the banking environmentworldwide has become transformed over the years and the banking public hasbecome more sophisticated in their purchase decisions. To respond toincreasingly sophisticated customer and market demand therefore, banksneed to put in place operational processes that ensure greater customerconvenience, better delivery of and increased accessibility to financialservices and products.

In reality, the banking sector has traditionally been one of the main usersoftechnological innovations. Grainger-Smith and Oppenheim (1994) aver thatthe banking sector is an old time beneficiary of the offerings of InformationTechnology (IT) and that IT has played key roles in the development of thebanking industry based

on the fact that the main function of banks can beviewed not really as that of dealing in money, but that of the capture, distribution,analysis and processing of financial information. They indicated that IT couldenable banks to widen the range of services offered to their customers,transform their operating systems, increase the volume of their services,operate at a higher level of efficiency and realize economics of scale. Insimilar vein, Ehikhamenor (2003) identifies the range of benefits that banks canderive from investing more in IT to include operational time reduction, improved operations, increased profitability, better management of customers' relationship, streaming of operations, expansion of activities, improved service, and minimization of exposure to risk in turbulent markets, among others.

Today's business environment is very dynamic. It undergoes rapid changes due to technological innovation, increased awareness and increased demands from customers. The banking industry of the 21stcentury operates in a complex and competitive environment characterized by these changing conditions and a highly volatile economic climate. Information and Communication Technology (ICT) is at the centre of this global change curve (Agboola, 2006). Hence, the

banks that will survive and compete effectively in today's business environment must necessarily integrate ICTinto their operational processes.Given this scenario, this dissertation attempts a synthesis of empirical facts on the extent to which investments in information and communication technology has impacted or influencedthe performance of deposit money banksin Nigeria.

1.2   Statement of the Problem

From inception up to the period of deregulation, the operation of banks in Nigeria were characterized by paper oriented methods rather than technological based systems with attendant tardiness in pace of operation, low employee productivity and general performance (Osabuohein, 2008). Hence, before the deregulation of the economy in the 1980s, the use of ICT in the Nigerian banking system was limited. However, Nigerian banks have since realized that the way in which they can gain competitive advantage over their competitors is through the use of technology, and this has engendered a growing rate of technology adoption in the Nigerian banking operations (Salawu & Salawu, 2007).

With technology, banking has become highly ICT based and because of its inter-sectorial link; the benefits of revolution in technology, as can be seen by its application to almost all areas of its activities has broadened the scope of banking practices and changed the nature of banking as well as the competitive environment in which they operate. A broad opening has been created around the world for banks and they are currently taking due advantage of these innovations to provide improved customer services in the face of competition and faster services that enhance productivity (Osabuohien, 2008).

In this regard, Ovia (2002) contends that banking in Nigeria has increasingly become dependent on the deployment of Information Technology and that the IT budget for banking industry in this area is by far larger than that for any other industry in Nigeria. Despite the huge amount invested on technological innovation in the banking industry in Nigeria, operational interruptions occurfrom time to time due to ICT systems. It is therefore necessary to inquire into the impact of ICT investments on the performance of deposit money banks (commercial banks) in Nigeria, more especially after the post-

consolidation era of 2005 when there were noticeable increases in ICT investments by the emerged banks.

1.3   Objectives of the Study

The broad objective of the study is to investigate and determine the impact of investments in information and communication technology (ICT) on performance of deposit money banks in Nigeria.

The specific objectives are to:

i.   Measure the impact of investments in information and communication technology (developmental cost and maintenance cost) on earnings per share (EPS) among deposit money banks (commercial banks) in Nigeria

ii.   Evaluate the impact of banks' investments in ICT on return on assets (ROA) among deposit money banks (commercial banks)in Nigeria.

iii. Measure the extent of investments in information and communication technology have impacted on profit before tax (PBT) among deposit money banks in Nigeria

iv.   Investigate the impact of investments in information and communication technology (ICT) on performance of deposit money banks proxied by profit after tax (PAT).

v.   Evaluate the impact of investments in ICT on total deposit (DEP) mobilized by deposit money banks (commercial banks) in Nigeria.

vi.   Determine the association (relationship) between ICT investments proxy variables (development and maintenance costs)and banks' performance variables among deposit money banks (commercial banks) in Nigeria.

1.4   Research Questions

The study evaluates investments in information and communication technology on performance of deposit money banks (commercial banks) in Nigeria by providing answers to the following research questions:

i. To what extent hasinvestments in ICT (proxied by ICT development and maintenance costs) jointly affect earning per share (EPS) among deposit money banks in Nigeria?

ii. To what extent has investments in ICT impact on return on assets (ROA) among deposit money banks in Nigeria?

iii. To what extent has investments in ICT impact on profit before tax (PBT) among deposit money banks in Nigeria?

iv. To what extent has investments in ICT impact on profit after tax (PAT) among deposit money banks in Nigeria?

v. To what extent has investments inICTimpact on total deposit mobilized (DEP) by commercial banks in Nigeria?

vi. What is the degree of association between ICT investment surrogates and banks' performance proxy's variables among deposit money banks in Nigeria?

1.5   Research Hypotheses

In order to achieve the above stated objectives, the following hypotheses stated in null form were formulated and tested at 5 per cent level of significance.

i.   The impact of investments in ICT on earning per share (EPS) among deposit money banks in Nigeria is not statistically significant.

ii. The impact of investments in ICT on return on assets (ROA) among money deposit banks in Nigeria is not statistically significant.

iii. There is no statistical significant impact of investments in ICT on profit before tax (PBT) among deposit money banks in Nigeria.

iv. There is no statistical significant impact of investments in ICT on profit after tax (PAT) among deposit money banks in Nigeria.

v. The impact of investments in ICT on total deposit mobilized (DEP) by deposit money banks in Nigeria is not statistically significant.

vi. The degree of association between investments in ICT and performance proxies' variables among deposit money banks in Nigeriais not statistically significant.

1.6   Scope of the Study

The study was restricted to Deposit Money Banks (DMBs) otherwise referred to as commercial banks that were in operation in 2013.   The study covered post-consolidation period of 2006 to 2013

due to the fact that the consolidation of banks that ended in 2005 changed the structure and composition of deposits money banks in Nigeria totally. Though a study of this nature is expected to cover at least a period of ten years, 2006 was chosen as base year because of the banking sector consolidation which ended in 2005 and the effect started manifesting in 2006.

The study covered13 out of the 20 commercial banks that were operating in the country as at 2013.The selected banks have all their financial statements available within the period under study, and their accounts were denominated in Naira, which is the medium of exchange and legally recognized currency in Nigeria. None of the selected banks operate under the CBN/NDIC takeover platform. The selected banks comprised international, national and regional commercial banks. The study covered a period of eight (8) years of post-consolidation era and banking sector restructuring (2006 – 2013). This period could be seen as new banking regime in Nigeria.

The study focused on investments in ICT and performance of deposit money banks in Nigeria. It took into cognizance investments in ICT (ICT development cost and ICT maintenance cost) and their effect

on service creation and delivery in Nigeria. Banks performance wasmeasured by deposit mobilization (DEP), profit before tax (PBT), profit after tax (PAT), earnings per share (EPS) and return on assets (ROA).

1.7   Significance of the Study

The importance of ICT in the transformation of all human endeavourscannotbe overemphasized, more especially in revolutionizing the process of creating new products and services delivery in line with globalization in the banking industry. Various studies on the use of ICT in Nigerian banks have been carried out. But most of such studies took place before the re-consolidation of 2009. Some studies examined the performance differentials between old generation and new generation banks that existed before the consolidation era of 2004/2005. Some scholars evaluated the impact of ICT as perceived by individual customers only. This study is more robust and recent as it deals with DMBs in totality. Moreover, it covers the post-consolidated period in Nigerian banking system2006 – 2013.

The study contributes to knowledge and understanding oninvestments in information and communication technology on performance of deposit money banks in Nigeria post-consolidated era. The study brings out the impact ofdeposit money banks'investments in ICT (development and maintenance costs) on performance within the period under study.

The outcome of this study will be of benefit to banks operators by highlighting the relationship between ICT investments variables and banks' performance. It will also assist the regulatory authorities; Central Bank of Nigeria (CBN) and Nigeria Deposit Insurance Corporation (NDIC) to fine-tune their policy formulation to enhance/improve the use of ICT devices in the Nigerian banking industry in particular and the Nigerian payments system in general. The banking public will also benefit from the study as it will enable them to know the various ICT related services and how they impact on banking operations and performance. It will equally avail governments and their agencies the opportunity to evolve policies that would further promote ICT development and maintenance in Nigeria.

1.8 Limitation of the Study

The study was limited to a period of eight (8) years due to consolidation of Nigeria banking industry which ended in 2005, the effect which began in 2006, which informed the choice of 2006 as base year for the study. The study employed purposeful non-random sampling technique. It sampled 13 deposit money banks that have all their audited accounts available within the period of study out of the 20 commercial banks that were in existence. The sampled banks represent sixty-five per cent (65%) of the total population. In term of branch network; the sampled banks have 3,750 branches out of total banks branches of5, 218that were operating in the country as at 2013 which represent seventy-two per cent (72%).The sampled banks were limited to thirteen (13) because some of the unsampled banks were under the CBN receivership, hence all their financial statements were not available from where required data would have been extracted. These banks are: Enterprise Bank Nigeria Limited, Keystone Bank Nigeria Limited, Mainstreet Bank Nigeria Limited and Union Bank Plc. Apart from this, three other banks: Citibank Nigeria Limited, Ecobank Nigeria Plc., and Standard Chartered Bank Nigeria Limited are multi-

nationals whose financial statements covered many nations and were denominated in foreign currency. Despite the above, the researcher is of the view that the outcome of the work can be relied upon to generalize on investments in ICT and performance of deposit money banks in Nigeria within the period of study.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

This chapter reviewed literature related to the study, under the following sub-headings:

2.1 Conceptual Framework

2.2 Theoretical Framework

2.3 Theoretical Studies

2.4 Empirical Studies

2.5 Summary of Review

2.1 Conceptual Framework
2.1.1 Technological Innovation and Organizational Performance

Innovation is a word derived from the Latin word meaning "to introduce something new to the existing realm and order of things" (Adegbite, 2010). An *innovation* is an idea, practice, or object that is perceived as new by an individual or other unit of adoption (Rogers, 2003).A large firm could engage and manage innovation successfully by putting in place structure and management that could influence organizationinnovations. This structure enable human resources to respond to change and work as a system. The structure is the

organization system that could enable it to cope, move along, link and connect the environmental systems, which include other organization, nations and global resources,people and conditions. Organization success depends on how it responds to change within and outside it.

Kast and Rosenzweig (1979) see a system as an organized whole consisting of two or more parts, components or subsystem delineated by identifiable boundary from its environmental supra system. It could also be regarded as an assemblage of things connected or interdependent to form a complexunity, a whole composed of parts in orderly arrangements according to some scheme or plan. General system theory could facilitate integration of broad scheme of knowledge across physical, biological and social work. Organizational structure includes human resource, work system, knowledge and skill which when effectively managed could positively influence innovation capability of individual and team for technology innovation. Work system includes all the elements that could indirectly influence human resource performance. Takeda (1993) agreed that organization should contribute to technology evolution and revolutions but the two should

be combined with organization work system to enable individual employee and groups to reach the highest level of performance.

The starting point of technological development, changes and innovations is always people. The people create, initiate, use and manage ideas that are the bases and directions of technology.Identity theory provides a way of assessing individual relations to organizational objectives and nationalgoals and enables us to understand human resource inspiration and readiness for technology innovation.

The motivation the individual receives determines the extent of its identity and his readiness to innovate for organizational and national development. This theory to Bennis (1969) provides strategies intended tochange beliefs, attitudes, values and structure of an organization so that they can better adapt to newtechnologies, market challenges and changes. It can also be used to plan intervention in organization process to increase organization effectiveness and health. Both Bechard, (1969) and Bolle De Bal (1992)demonstrated the relationship between organizational development and managerial effectiveness. Organizational efficiency requires that somebody in a strategic position

should feel the need forinnovation and change. These include the need to:

i. Change managerial strategy;

ii. Make organizations more consistent with both individual needs andthechanging needs of theenvironment;

iii. Change structure and roles;

iv. Change the motivation of the workforce;

v. Make better planning;

vi. Improve inter-groups collaborations; and

vii. Adaptation to new environment.

Organizations in the competitive global economy require managers that can combine neatly organization and individual interests for the common good. Today's workers want to participate in drawing up of management plans, in decision making and want to be recognized and appreciated for their contributions. Continuous organizational improvement require managers and team leaders that are capable of bringing out new ideas and techniques from their subordinates and can create environment in which new thinking is encouraged and welcomed. Drucker (1985) argues that innovation

comprises of both hard work and inspiration. Managers should not be rigid in managing their employees but allow them to use their initiatives. Severe and inflexible rules can be easily circumvented.

In spite of the changing conditions that characterized the work place of the 21st century, man's domination in the society and organizational settings remain the same. Many aspects of management may havechanged, but the changes have not altered or removed the dominating position of human resources. Technology, most especially information technology have only expanded man's minds and intellect but have not replaced him. Human resource capability to manage other resources and to adapt to the changing conditions makes his position dominant. Human resource management theories and practicescould therefore be useful to provide effective methods of managing all other aspects of the organization for the achievements of its objectives.

Managers, supervisors and employees have to practice and operationalize management theories topromote technology innovation for organizational competitiveness. It is the realizations of these that have made many organizations to consistently promote the relevance of human resource management to technological innovation. In spite of

the dynamic technological changes, human resource still needs to apply his skills and intellect in practical ways for improved technological innovations. Whenever management styles of top managers deviate from human resource management theories, concepts, models and practices, they are often off-target in their efforts to improve employee performance for technology innovation and for the overall organization improved performance. Human resource management provides managers with adequate tools for improving technology innovation (Dauda, 2009).

Many industries embark on improving customer satisfaction by getting the latest machines to improvetheirorganization's performance. They believe that acquisition of latest technology will improve operatingpractices and the quality and quantity of their goods and services. This is often complemented by otheropportunistic customer responsive practices such as aggressive marketing strategies, sales promotion,public relations and others. Nevertheless, in spite of these, many organizations still fail to reap the benefits of their strategic innovations because these innovations are not supported by effective human resource strategies for their implementation. All emphasis were

often placed on what can be easily measured andcalculated, and innovation processes were often dominated by finance, marketing and operational staff inputs, and human resource managers were often considered as an appendage rather than activeparticipant in the management effort to improve technology innovation (Dauda&Akingbade, 2011). Barrow (1997) and Dauda, (1998) argued that business and industrial growth could only be enhanced if effective human resourcemanagement strategies are properly implemented in all units of the organization such as marketing,production, finance and others.

Most developing nations of Africa, Asia and Latin America could not harness their natural, material andhuman resources for socio-economic development as a result of their inability to utilise science andtechnology. This is not unconnected with the failure of their governments to encourage technologyinnovation and/or lack of commitment of their people to innovate. But the advanced countries of Europe,America, Russia and few emerging countries such as China have succeeded through the efficientapplication of science and technology in transforming their material and human resources into

goods andservices and dominate the world market (Dauda&Akingbade, 2011). In the developed countries, government and organizationsprovided enabling environments and rewards to motivate their scientists, engineers, technologists,technicians and artisans/craftsmen to innovate; while in most developing countries, apart from lack of theseindices, human resource management factor was not considered. Human resource was not encouragedand rewarded to inspire and promote technology innovation (Dauda&Akingbade, 2011).

Dauda (2010) is of the view thatfor technological innovation to be enhanced in Nigeria banks, apart from purchase of latest equipmentdesigned and manufactured in the advanced countries of Europe, America, Japan and China, human resource should be well managed and motivated for better productivity. Commensurate reward should be given to employees for the performance of their roles andother extra rewards for their individual and team creativity and innovation. Group norms that promoteindividual interaction and improved performance should be encouraged.

Performance indicatorsrefer to those pieces of empirical data that are indicative of how well or how poorly, a firm is performing against its preset objectives and goals (Ayantoye, 2010). The performance indicators in the study include ICT investments, return on assets, profit before tax, profit after tax and deposits, each of which is briefly described here under.

i. **ICT Investments:** It is the part of an organizational outlay involving the process of the determination, acquisition, use and maintenance of all information technology devices within the organization (Adewoye, 2007).

ii. **Return on Assets (ROA):** This is obtained by dividing the net profit after tax by the value of total assets. It measures the profitability of all financial resources invested in the firm's assets. It evaluates the use of total funds committed into the business (Pandey, 2010).

iii. **Earnings per Share (EPS):** It is one of the investors' ratios that show the profitability of a company on per share basis. It is a good yardstick for measuring the profitability of common (ordinary) shareholders' investment. EPS is obtained by dividing

the net profit after tax less preference dividend by the total number of common shares raking for dividend.

iv. **Profit before Tax (PBT):** This measure the income before interest and tax as a percentage of total capital employed. It is used to measure the efficiency with which management has used its long-term financial resources to improve its earnings. A profitability measure that examines the firm's profit before it pays taxes, more especially company profit tax. A company should earn profit to survive and grow over a long period of time.

v. **Profit after Tax:** This is the profit due to a company in a financial year after the company income tax has been deducted and capital allowance and tax refund for previous year added. Tax will be deducted from the operating profit after interest on debenture has been charged against the operating profit.

vi. **Deposit:** This represents money put in care of banks which form their major liability. It represents the stock-in-trade for banks from where loans and other investments can be carried out for

profitability. It includes credit balances in customers' current accounts.

vii. **Return on Equity (ROE):** Is the measurement of the return on shareholders' investment by expressing the profit earned by ordinary shareholders as a percentage of total equity. This measures the overall level of efficiency of the business in managing its total range of different investments and in generating the return for its stockholders. It is the main measure of how well the management is running the firm (Ayantoye, 2010).

viii.**Bank Recapitalization:** Is the act of beefing up the long-term ownership capital of a bank to the level required by the monetary authorities and or to the level voluntary desired by the shareholders (Nwude, 2005).

2.1.2 Information and Communication Technology

Informationtechnology encompasses all matters relating to the processing, use of a tool, manipulation, and management of information (www.itgovernanceonline.com). Technology generally refers to the application of knowledge for the execution of a given task.

It entails skills and processes necessary for carrying out activities in a given context. Information technology, thetechnology that empowers information, is a term that generally covers the harnessing of electronic technology for the information needs of a business at all levels. It refers to the automation of processes, controls, and information production using computers, telecommunication software and ancillaryequipment such as Automated Teller Machines, and debit card, (Khalifa 2000). It was defined by the Nigerian National Policy for Information Technology (2001) as: "computer, ancillary equipment software and firmware (hardware) and similar procedures, services (including support services) and related resources, any equipment or inter-connected system or subsystem of equipment that is used in the automatic acquisition, storage, manipulation, management, movement, transmission or reception of data or information".It is a term that generally covers the harnessing of electronic technology for the information needs of a business at all levels.

Communication Technologyis everything associated with the use of tools toprocess and transfer data from one device to another. It covers not only computers, but also including telephone, radio, fax and

other equipment (www.itgovernanceonline.com).Diffusionis the process by which an innovation is communicated through certain channels over time among the members of a social system. It is a special type of communication, in that the messages are concerned with new ideas (Rogers, 2003).Communicationis a process in which participants create and share information with one another in order to reach a mutual understanding. This definition implies that communication is a process of convergence (or divergence) as two or more individuals exchange information in order to move toward each other (or apart) in the meanings that they ascribe to certain events (Rogers, 2003).

2.1.3 Definition and Classification of Technological Innovations

Technological innovation is defined by the European Union States (2005) comprises implemented technologically new products and processes and significant technological improvements in products and processes. It involves a series of scientific, technological, organization, financial and commercial activities. A technological innovation has been implemented if it has been introduced to the market through product innovation or used within a production process i.e. process innovation. A technological innovating firm is one that has

been implemented technologically new or significantly technologically improved products or processes (Szymanski &Ropetto, (2000), Adegbite, (2010).

However, before articulating the importance of innovation, it is necessary to make a distinction between innovation and invention. Invention is the first occurrence of an idea for a new product or process, while innovation is the first attempt to practicalise and commercialize the idea. In other words, invention is a new product, whereas innovation is a new value added to an existing product. Inventions are mostly carried out in Universities and Research and Development (R & D) organizations while innovations occur mostly in firms, though they may also occur in other types of organizations (Szymanski &Ropetto, 2000). However, to be able to turn invention into innovation, a firm normally needs to combine several different types of knowledge, capabilities, skills and resources. For instances, the firm may require production knowledge, skills and facilities, market knowledge, a well-functioning distribution system, sufficient financial resources and so on .

Innovation should also be understood as something new to a local context. This relativity to the context is important and particularly relevant for developing countries (Adegbite, 2010). Though the importance of innovation is increasing particularly in this age of globalization and market-driven economy, however there is still a big difficulty in its understanding. Presently, there exists a clear anxiety among researchers and scholars as to the best approach to defining it. In spite of this difficulty, there is a general consensus that the definition and theory of innovation is important in this present age of knowledge-driven economy (Szymanski &Ropetto, 2000). Therefore an understanding of innovation demands a precise and objective definition.

Innovation theorist scholar, Szymanski and Ropetto (2000) further argued that innovation research theory is highly dispersed. As such there is no sufficient data set for building innovation prediction model. In spite of this, there is still a need for developing an objective definition of innovation. In the early works of Schumpeter (1934) on economic development, innovation was described as the engine of economic development. It is often an effect of the small incremental or

marginal changes in the product or process. Schumpeter (1934) further distinguished between five different types of technology innovation. These are new products, new methods of production, new sources of supply, exploration of new market and new ways to organize a business. Schumpeter thus places innovation at the heart of economic development. He regarded innovation as the "doing of new things or the doing of existing things in a new way".

For the purpose of economic impact analysis of innovation, most researcher focus on the first two, that is, new product and new methods of production. At the firm level, innovation is defined as the development of new or improved product or services (Szymanski &Ropetto, 2000).The reason for focusing particularly on the dysfunction between product and process innovation is based on the assumption that their economic and social impact may differ. While the introduction of new product is assumed to have clear, positive effect on growth of income and employment, it has been argued by researchers that due to its cost –reduction effect, process innovation may have more ambiguous effect (Szymanski &Ropetto, 2000).

Ilori (2006) categorizes technology as a special resource and an important strategy for the exploration of the natural resources sector, and an agent of social and economic change. He further described technology as a body of knowledge which is used significantly by a given society at a given moment to resolve concrete problems in accordance with the culture and scale of value. It was further described as systematic knowledge for the manufacture of a product, for the application of process or for rendering of service, including any integrally associated managerial and marketing techniques.

Ilori, (2002) defines technological innovative capability as critical assets, human and organizational capital, that are employed by productive enterprises for the efficient use of machinery, equipment and technologies. At the firm level, these capabilities consist of several elements of skills and knowledge. Essentially, the main resource components of technological capability include the level of skilled manpower, pool of technical knowledge available and the equipment required for the dissemination of the technologies. This means that technological capability as a necessary ingredient for product and

process innovation comprises of knowledge, skills, experience, institutional structures and linkages within a firm and between firms.

In addition, other scholar such as Drucker (1985) defines innovation as the process of equipping in new, improved capabilities or increased utility. He further argued that innovation is a value which can be measured with environmental impact. Accordingly innovation has to be market and product oriented. Nevertheless, from the point of view of business management, the process involves two man tasks. These are marketing and creation. Whereas the marketing function of firm is to satisfy current needs of the customers, innovation goes further to satisfy consumer future needs. Without ability for content, innovation and enterprises may disappear due to changes in introduction of new consumer needs, technology or production process and intense competition from other producers (Drucker, 1985).

In a global perspective, the following forms of innovation can be distinguished. The first one relates to local improvement based on the adoption of technologies which are available worldwide or locally. The second type of innovation is technology adaption which involves adaptation made to existing technologies. The third type of innovation

is technology creation which is the design and production of technologies of worldwide significance (Aubert, 2004)

The European Commission (1995) also defines innovation as the renewal and enlargement of the range of product and services and associated markets, the establishment of new method of production, supply and distribution, the introduction in changes in management, work organization, and the working conditions and skills of the workforce. Nelson (1993) distinguishes between two types of innovation. These are technological and commercial. Technology innovation is the successful implementation of technical ideas new to the institution creating it. A commercial innovation is the result of the application of technical, market or business – model ingenuity to create a new product, process, or service that is successfully introduced into the market.

The OECD council (2004) defines innovation as a process through which a nation creates and transforms new knowledge into useful product, services and processes for national and global markets which leads to value creation and higher standards of living. The World Bank (2004) reported that the concept of innovation

encompasses not only technological innovation that is, the diffusion of new products and services of technological nature into economy; it also includes non–technology forms of innovation, such as organization innovation. The later include the introduction of new management or marketing techniques, the adoption of new supply or logistic arrangement, as well as improved approaches to internal and external communication and positioning.

Oyeyinka–Oyelaran (1996) in his research findings also characterizes innovation into product and process. Adaption innovation and adaptive technical change are those activities directed at modifying the technical basis of production process prior to full scale operation. It is also the changesto a product before it is introduced to the market. Adaptive innovation draws largely on know-how techniques and existing knowledge base.

Incremental innovations are those technical changes aimed at correcting technical imbalances: and modifying minor, albeit significant core or peripheral system noises. This activity, according to Adegbite (2010) has been identified in the literature as contributing significantly to the economic change process and to productivity

growth. It is also the basis for what Bell (1978) describes as autonomous technical dynamism. Evolutionary incremental innovation provides the basis for more significant major innovation in the future. Whereas emphasis has been put on major technological innovation in industrialized countries, minor incremental innovation with its vastly different characteristics seems to be more predominant in less developed countries (Oyeyinka – Oyelaran, 1996).

It is evident from the foregoing that the concept of innovation has been widened from its earlier Schumpeterian form to accommodate non- revolutionary but equally significant incremental technical change that place on the firm's shop floor, rather than within R &D organization (Oyeyinka-Oyelaran, 1996). Some of these innovation or incremental change made the difference between firms closing down and moving forward to make profits. To this extent, they constitute technical advance.

2.1.3.1Promotion of Technology Innovations

The provision of innovation, in particular, technological innovation in developing countries has become an area of research interest in the past two decades. The growing interest in the subject

stems from the recognition of its importance because of the perceived failure of traditional economic policies (Aubert, 2004). These traditional policies which is embedded in the privatization, liberalization, deregulation and structural adjustment policies (SAP) have clearly demonstrated their limits for promoting sustainable growth in developing countries (Adegbite, 2010).

Similarly, policies focusing on modernization, in terms of massive investment in infrastructure and institutions by governments, have not yielded the expected results. Thus, there is tendency to take a critical look at technology including its creation and diffusion as the engine of economic development. Another reason adduced for interest in the subject is that most developing countries face genuine obstacles to innovation and this is precisely why they remain underdeveloped. These obstacles derive from inappropriate business, technological and as well as the socio-economic environment (Adegbite, 2010)

The overall context in which technology innovation takes place in developing countries is dominated by two global events, the first one, according to Aubert (2004), is the intensification of the globalization process. This globalization manifests itself by the

importance of trade within the global economy. Specifically, globalization is the closer integration of countries and people of the world and the breaking down of artificial barriers to the flow of goods, services, capital, knowledge and people across national borders. It is a process of creating a global market place of investments, trade and information through the integration of economic decision making on consumption, investment and savings across the world (Adegbite, 2010).

The key elements of this process are the interconnection of sovereign nations through trade and capital flows applied, harmonization of the economic rules that govern relationship between sovereign nations, creating structures to support and facilitate dependence and interconnection, and creation of a global market place (Aubert, 2004). The second is the intensive and on-going technological change stimulated by scientific advances in all aspects of the economy particularly in the information and communication technology (ICT) (Aubert, 2004).

In spite of positive trend in the global economy and technological advancement, technology innovation climates in most

developing countries are hampered by weakness of other key elements of knowledge-based economies which Aubert (2004) defines as the four pillar framework. These are the levels of educational attainment, lack of appropriate technical skills, the business environment and the information infrastructure. Educational levels are very low in most developing countries. This is a significant barrier to the development and diffusion of technological innovation in these countries.Maloney (2004) states in clear term the relationship between educational needs and the different phases of industrialization.For instance, in the pre-industrial phase, educational needs demand only basic literacy. In the industrial phase, more professional and medium-level skills are required. In this post-industrial phase, there is a need for a significant share of the population with tertiary education, with the rest of the population having at least functional literacy. Competent management with requisite modern management skills and systems is essential for any business enterprise. With globalization, the technical and management skills for success in the global market place have changed substantially.

As a consequence of the unpredictable and problematic political, social and economic environment, the national innovation systems in developing countries are poorly constructed and are very weak (Aubert, 2004). The national innovation system, in this context, is defined as the set of organizations which include firms, universities and research and development(R & D) institutes and their linkages through which innovation processes develop (Ilori, 2006). On the enterprise side, a large number of micro and small scale enterprises (MSEs) operate in the informal sector while medium and large-scale foreign based multinational firms tend to be more predominant in the formal sector.

On the knowledge side, there is generally a limited research by scholars in developing countries having research facilities in universities and R&D institutes which are poorly connected to local realities particularly to labour market needs and opportunities. Another major problem hindering the national innovation system is the lack of technological support services and infrastructure.

From the foregoing, it is evident that technological innovation, wherever it takes place, can be regarded as an indicator of the society

or industrial tendency for progress and its inherent capability to translate what may have been an idea, into productive use. Unfortunately, Oyeyinka-Oyelaran (1996) showed that not much attention is paid to the study in developing countries whenever the issue of technological innovation is discussed, because of the prior assumption that developing countries are either incapable or do not need to carry out innovation. This is because technological innovation has also been associated with revolutionary scientific breakthrough which by all historical records had always been a monopoly of the richer industrialized countries. However, this is a rather limited definition of innovation. Beyond the first commercial exploitation of a product or process in the classical definition of innovation, the subsequent phases of imitations and adaptations are not just important but constitute critical sources of improvement on the original product or process. Oyeyinka-Oyelaran, (1996), also demonstrated that subsequent stages of use of innovations contributed to important growth in productivity.

2.1.3.2 Concept of Technical Change

An elaboration of the technical change as it relates to its generation and application in developing countries can be found in the technical change literature. For instance, Bell (1984) classifies technical change into three broad categories. The first type is technical change which broadens an industrial base of the economy. The second is the evolutionary or incremental improvement to existing techniques achieved by effecting technical change to existing products.The third is the generation of new knowledge through research within the firms or within separate R&D institutions.

According to Adegbite (2010), the first two types of technical change can be found in most of the more advanced industrialized countries and the newly industrialized countries. Also, while organized R&D and basic research programmes have led to the more revolutionary breakthroughs, minor incremental technical change has equally generated substantial productivity and growth more especially in developing countries (Adegbite, 2010).

On the sources of innovation, incremental and adaptive technical change constitutes the main source. However, the innovation strategies

adopted in each country depend on the phases of the innovation process and the taxonomic category of the firms. Adegbite (2010) and Akinbami (2001) identify three categories of firms. These are small firms that continually evolve by integrating vertically with the modern large sector. These are referred to as "auxiliary firms". There are those that can stand on their own irrespective of the modern large-scale sector by finding their own niche market. They are referred to as independent firms. The third categories are those that are rooted in past practices serving traditional markets, are unable to adapt to changing environments and may sometimes wither away.

This categorization is important for both research and policy. This is because of the renewed interest in activities that bring about the technical change. Given the specific cumulative and tactic nature of technology, most technological learning takes place at the enterprise level (Akerele, 2000). Many economists concluded that in most developing countries, small scale enterprise do not possess the education and training necessary for operating new technologies (Akerele, 2000). Being innovation is likely to lead to the accumulation of technological knowledge while imitation and adoption of techniques

build up a wide variety of skills and experiences that is difficult to destroy. In this process, firms, industry and society learn. Technological learning is the ways in which an enterprise builds up its stock of knowledge, experiences and skills (Adegbite, 2010).

The foregoing analysis shows that technology innovation definitions, concepts and theory may overlap. Therefore, there is no consistent meaning and understanding of technology innovation. They vary from very broad to more narrow sense particularly when it is used for research and quantitative measurement. These different approaches are designed by researchers to capture different factors of the technology innovation depending on the problem being solved.

2.1.3.3 Technology Innovation Strategies

Freeman (1982) identifies two kinds of innovation strategies which are offensive and defensive. An offensive innovation strategy is aimed at achieving technical and market leadership by being ahead of competitors in the introduction of new products. However, in developed and developing countries alike, only very few firms can truly be classified as offensive innovations. The kind of research engaged in by an offensive innovation has been classified in the

literature as oriented fundamental research or background fundamental research.

A defensive innovation strategy may be defensive, imitative, dependent or opportunist. This was explained by Freeman (1982) in his research on the nature and timing of innovations that the defensive strategies firm does not aspire to technical and economic leadership. At the same time, it does not want to operate with obsolete technology, neither does it want to take the risks and incur avoidable losses. Instead, it hopes to benefit from the market leaders.

In the same study by Freeman (1982) and in another study by Kajogbola (1999), they recognize that defensive innovation strategy, while not absent from firms in developed countries, can appropriately describe the innovation landscape of enterprises in most developing countries such as Nigeria. In these countries, the majority of innovations were in response to immediate threats of deterioration in the established market and profit positions of the enterprise.

In another study of metal fabrication enterprises in Oyo State, Nigeria, Akerele (2000) characterizes innovations as process, product

or organization in nature. He also investigated whether the innovation in a product or process was adaptive, incremental, original, revolutionary/radical or whether it has not been done before or whether it was imitative in nature. He further elaborated on each of the types of innovations as follows:

a. **Adaptive innovations** are activities directed at modifying the technical basis of production process to full-scale use; or the changes to a product before it is introduced into the market. It draws on known techniques and existing knowledge base. In most cases, adaptive efforts are necessary to change a production process.

b. **Incremental innovations** are evolutionary technical changes aimed at correcting technical imbalances and modifying minor significant core or peripheral system noises. It is also referred to as autonomous technical dynamism (Adegbite, 2010). It becomes evolutionary incremental when it provides the basis for more significant major innovations. In industrialized countries, emphasis is on major technological breakthroughs while it is minor in the case of less developed countries (Akerele, 2000).

c. **Original innovations** constitute special events which are revolutionary or radical innovations. Some products or processes may be original to a particular locality but their technical or scientific basis may not be new.

d. **Imitative innovations** may not be original but has a feature of existing process or product being modified.

In his study of small-scale metal fabrication in south-western Nigeria, Akerele (2000) also revealed that innovations into product on the average are 70% while that of process is 30%. He further argued that adaptive innovations constitute the bulk of technical change process and that 72.5% of the innovations in most micro and small-scale firms are adaptive while 24.5% are incremental. This signifies that the incidence of original innovation is almost not in existence.

Furthermore, in their different research Freeman (1982) and Oyeyinka-Oyelaran (1996) have also identified two main reasons why firms in most developing countries seem not to carry out innovations voluntarily. First is the lack of technical and managerial capabilities to innovate. While most large-scale multinational enterprises engaged in manufacturing activities rely on the technical expertise of their

overseas affiliates, micro and small enterprises particularly those in the informal sector of the economy have no resources such as equipment, manpower and capital to finance or even imitate innovations. For these micro and small enterprises, their strategy is to survive the harsh economic environment rather than to innovate. However in cases when innovation occurs, it is usually incremental in nature.

However, for innovation to occur an enterprise must possess in some quantity some broad range of technical and managerial skills.To analyze these types of skills, Bell and Pavit (1993) identify two categories of learning. The

first refers to the methods by which an individual firm or an economy accumulates a set of skills through education, training and experience which can be hiring of skills and the well-known learning by doing.

The second category is technical change which has been used interchangeably with learning in the literature. Nevertheless, Akerele (2003) suggests that technical change should not be regarded as resulting from learning alone but in combination with other inputs. Bell (1989) also suggests three sub-categories of learning. These are

elementary learning which involves "learning by doing" and "learning by adapting"; intermediate learning which consists of "learning by design" and "learning by improved design" and advanced learning, which is "learning by setting up a complete production system".

Oyeyinka-Oyelaran (1994) further stresses that the importance of technological learning cannot be underplayed since this is the way in which firms acquire and build up technological knowledge and core competencies. He further argued that learning represents the dynamic component of the process of acquisition of capabilities and product innovation. These are referred to as the "apprenticeship" system of training "on-site" training at supplier's factory; "on the job" training; "expert contracting"; support mechanism provided by public institutions, "learning by doing" production and maintenance; and "learning through transactions" with local and external agents.

According to Biggs, Shah, and Srivasteva (1995), skill acquisition as a determinant of technology innovation applies equally to the process of learning in micro and small-scale enterprises. This is made up of:

i. **Learning by doing** which involves 'on the job" skill acquisition by carrying out tasks in the production process;

ii. **Learning through training or transmission of skills** and further improvement during periods explicitly set aside for these purposes;

iii. **Learning from changing** which involves the introduction of 'innovative" technical change. It attempts to adapt, diversify, improve quality and bring out new products or variants of production processes;

iv. **Learning by evaluation** which involves the feedback of regular monitoring of changes and performance in production;

v. **Learning by hiring** through consulting service and taking specialist advice outside the enterprise; and

vi. **Learning by searching** scientific research applied to production.

It is evident from the various researches above that skill acquisition through learning strengthens the technological capability

for generating process and product innovation in all business enterprise.

2.1.3.4 Types of Technology Innovations

Technology innovation is the first commercial introduction of a new technology, which may take the form of a process or service. It emergence is as a result of several activities spanning length of time, depending on the type of technology (Ilori, 2006). The phases identified by Stanton, Etzel, and Walker (1994) are idea generation, screening of ideas, research and development (R&D), business analysis, prototype development, test marketing and commercialization. These seven phases have been classified into three phases as pure research, technology development and production and marketing.

The seven stages or three phases in the innovation process are usually presented as a step-by-step approach, which proceeds in a linear and static manner, with a phase commencing after a preceding phase has been completed. Ilori, Adeniyi, Sanni, Oyewale and Irefin (2002) further report that some companies that followed all the seven phases in an integrative and overlapping manner in the development of

new products succeeded in their commercialization efforts in Nigeria. The innovation process requires considerable communication among different actors and institutions who acts as agents of innovation. Within the boundaries of a nation, they constitute the elements of a national innovation system with identifiable national and societal specifications.

a. Product Innovations

A product innovation refers to any new or improved product, equipment or service that is introduced in the market. It can be radical or incremental. A radical innovation is a newly marketed product whose functionality, technical construction, performance characteristics, design and use of materials and components is new or substantially changed. However, product innovation does not necessarily require change in the physical products, but all marketing parameters can lead to some actors regarding the products as new (Oyeyinka-Oyelaran&Lall, 2006).

A lasting price reduction may be innovation in the eyes of consumers, because it changes the value-for-money perceived in the products, and it may be an innovation in the eyes of the producers

when it is based on a cost-saving change in production technology. In like manner, a major change in advertising message can lead to an innovation when it leads to a major repositioning of the product. However, an incremental innovation or improvement is an existing product whose technical characteristics have been enhanced or upgraded (Luecke& Katz, 2003).

b. Process Innovation

Product innovation creates new products and services, process and innovations however reduces the cost of producing existing products or result in the production of new products. Thus, a process innovation is defined as an investment into a company's skills and resources, which allows the company to bring about product innovations (Luecke & Katz, 2003). Given the view that has been adopted on product innovations, process innovation covers both cost-saving changes in production processes and the introduction of new technology, which allows the production of a range of products quite different from the existing one (Luecke& Katz, 2003).

Process innovations may also refer to technological innovations that is based on R&D, and may also refer to innovations with regard to

market-orientation skills. The production of a market intelligence system, or the re-organization of the product development process, both of which may enable the company to become better in developing product innovations, may therefore likewise be regarded as process innovations (Lucke & Katz, 2003). In summary, process innovations refers to the adoption of new significantly improved production methods. These improvements may involve the introduction of new equipment designed either to make new products or to increase the efficiency of an existing production process, thereby lowering costs (Luecke & Katz, 2003).

c. Organizational Innovations

This refers to new approaches to managing or organizing the firm (Davilla, Epstein & Shelton, 2006). Organizational innovation involves the creation or alteration of business structures, practices and models and may therefore include process, marketing and business model innovation. It may take the form of a new enterprise resource planning system or a new performance appraisal system (Davilla et al, 2006).In summary, it should be noted that the three domains of innovation, that is, product, process and organization, are not mutually

exclusive. Process innovations may lead to product innovations and similarly, product innovations may subsequently induce process innovations.

2.1.3.5 Sources of Technology Innovations

A variety of factors, internal and external to an enterprise may contribute to technology innovation capability. Bell (1984) in a research study on the accumulation of industrial technological capability in developing countries argued that as far as internal factors are concerned, the entrepreneur(s) and employees bring a certain stock of knowledge and skills into the enterprise, which they obtained through earlier experience. Over time, the capability base of the enterprise is further enhanced through internal learning, involving investment in R&D, informal experimentation, debugging, making minor adaptation to products, processes and organization, in-house staff training and so on (Adegbite, 2010). Apart from some limited spontaneous 'learning-by-doing', these learning efforts need resources. This makes them amenable to observation and measurement, although informal incremental activities tend to be extremely difficult to estimate. Studies generally confine their measurement of intra-firm

learning to the most readily observable inputs, mainly R&D expenditure and number of scientists and engineers or R & D staff employed (Bell, 1984).

Lundvall (1992) explaines that for the external sources of inputs to technology innovation, interaction with suppliers, customers, public institutions and industry associations may provide missing inputs into the learning process which the enterprise itself cannot easily provide. External interaction may take place for the purpose of gathering information about technologies and markets, and also for obtaining various other inputs to complement the internal learning process. Some of these include external staff training, parts and components, advisory and consulting services and so on. The mobilization of external resources for technological innovation is called 'learning by interacting'.

The need for external sources of input to technology innovation is consistent with the evolutionary perspective of building and extending the firm's capabilities. For instance, Santoro and Chakrabarti (2002), in their theory of the firm, suggest that the knowledge-based view of the firm emphasize the firm's ability to integrate external

sources of explicit and tactic knowledge. This is consistent with the central tenet of the dynamic capabilities view of the firm which suggests that firms acquire new knowledge, skills, experience and capabilities through organizational learning that can be described as the act of bringing in or creating new knowledge.

Furthermore, the need for ongoing improvement through organizational learning is necessary due to continual changes in technology (Adegbite, 2010), the speed of technological change, and major changes in the overall competitive landscape for most firms. In this context, organizational learning is not limited to the internal functioning of the firm, but often results by assimilating and integrating external knowledge (Adegbite, 2010).

Another major reason for external inputs to technology innovation is based on the premise that organizations are limited by the amount of skills and knowledge they can develop and maintain internally since most firms have a finite group of employees (Santoro &Chakrabarti, 2002). Also, since the rapid pace of technological change in many industries often renders skills and knowledge obsolete, no organization is entirely self-sufficient. Therefore, exchange theories

by Smith (2005) suggest that collaboration between firms and R&D institutes can provide firms with skills, knowledge, and access to facilities needed to effectively enhance the firm's capabilities for technology innovations by exchanging complementary resources and growing competencies to generate value-added synergies.

In summary, relationship with R&D institutes are used by these firms to strengthen skills, knowledge and gain access to facilities in order to advance a broad range of knowledge useful to drive technology innovations (Santro &Chakrabarti, 2002). The foregoing suggests that a large number of potentially important internal and external factors might contribute to a greater or lesser degree to the innovation capability of enterprises. In summary, the potential important sources of innovation that are generated inside the enterprise are as follows:

  i.   The initial educational background and prior working experience of the owner/manager;

  ii. The professional qualifications of the employees; and

  iii. Various kinds of technological efforts which include further accumulation of technological capabilities, such as formal

and informal R & D, formal and informal on-the-job training, and acquisition of technological licenses.

In the same manner, potentially external sources of innovation also include:

i. The frequency of networking with a variety of other private-sector agents and various R & D institution;

ii. Any geographical proximity advantages associated networking; and

iii. The nature and extent of institutional support received as well as the interactions with assistance agencies and proximity advantages associated with these contacts (Adegbite, 2010).

2.1.4 Banks Services/Products

The traditional function of banks in any economy is the acceptance of money from and collection of cheque for customers and placing them to the customers' credit; the honouring of cheque or order drawn on the bank by the customer when presented for payment; and granting of credit by lending of money (Afolabi, 1990). Banks renders various services to their customers ranging from deposit collection to

savings and deposits accounts, honouring of cheques and payments orders or instructions emanating from customers, and giving of loans and advances.A service is any activity or benefit that one can offer to another which is essentially intangible and does not results in the ownership of anything. It is a separately identifiable, intangible activity, which provides want satisfaction (Kotler, 2003). Banks services are intangible in nature, yet they are wants satisfying. Services have the following characteristics:

i. **Intangibility:** Services are intangible, that is, they cannot be seen, tasted, felt, handled or smelled before they are bought. Banks as services providers emphasized the benefits of their services rather than just describing their features.

ii. **Inseparability:** Service cannot be separated from the source rendering it, hence its creation requires the source (whether a person or a machine) to be present. This means that the production and consumption of services occur simultaneously in contrast to atangible product that exists whetheror not its source is present. Service creates interaction between provider and customer; hence customer is interested in whom the service provider is.

iii. **Variability:** The form of service can vary greatly depending on who is providing the service and when it is being provided. A seminar lecture given by an experienced Ph.D holder in a particular discipline is likely to be perceived to be of higher quality than that given by a first degree holder. This is the more reason why professionalism is more pronounced in service industry, more especially in the sensitive sections/departments.

iv. **Perishability:** Services cannot be stored. In a trip, the earning from an unoccupied seat in a bus is lost forever. In the same way, services not demanded for is totally lost for that day, unlike physical products where number of products to be produced is known from the onset.

For quality services which will improve the image of banks and impact positively on their performances, banks have invested heavily on ICT.ICT products relevant to banks can be categorized into three groups viz (Oyebisi&Agboola, 2003):

   i. **Bankers Automated Clearing Services:** This involves the use of Magnetic Ink Character Reader (MICR) for cheque processing. MICR is a system that provides for

encoding of cheques and documents with characters in magnetic ink so that they can be electronically read. It is capable of encoding, reading and sorting cheques for timely clearing.

ii. **Automated Payment Systems:** which include products such as Automatic Teller Machine − ATM (a remote cash dispenser that assists customers to have access to withdrawal outside the banking hall), Plastic Cards (microchips such as credit cards, debit cards, and store value cards that store electronic cash to use for online and off line micro payments) and Electronic Funds Transfer - EFT (an electronic tool that is used to effectively transfer the value of exchange process for goods and services, ideas or information from one bank account to another account in another bank). Electronic Letter of Credit, Electronic Cheque and Electronic Cash fall under automated payment system

iii. **Automated Delivery Channels:** which include interactive television and the internet. The device

enables customers to carry out transactions with their banks through connection between the customer's terminals in their homes and/or offices and the bank's computer system. VSAT (Very Small Aperture Terminal) is a satellite communications system that serves home and business users. Customers with such terminals are able to contact the bank and get any form of information (e.g. on bank balances, deposits into and withdrawals from accounts) through this medium.

Furthermore, other ICT based bank services/products were discussed as follows:

a. Automated Teller Machines (ATMs): The ATM is an electronic cash dispenser which allows accounts holder 24 hours access to their funds. The entire system is leveraged upon a complex network of ICT system to verify online, information contained in a card before cash request is honoured. It has been generally found to be highly reliable and very convenient for users (CBN, 2007).

ATM is a combination of a computer terminal, record-keeping system and cash vault in one unit, permitting customers to enter the bank's book keeping system with a plastic card containing a Personal Identification Number (PIN) or by punching a special code number into the computer terminal linked to the bank's computerized records 24 hours a day. The combined services of both the Automated and human tellers imply more productivity for the bank during banking hours. Also, as it saves customers time in service delivery as alternative to queuing in bank halls, customers can invest such time saved into other productive activities. ATMs are a cost-efficient way of yielding higher productivity as they achieve higher productivity per period of time than human tellers (Dauda&Akingbade, 2011).

In the Nigerian environment, SocieteGenerale Bank blazed the trail in the provision of ATMs in 1984 (CBN, 2007). Currently, practically all the deposit money banks offer ATM services. Evidence has shown that growing awareness and acceptability of its usage. Available statistics show that the total number of ATMs available in the country has increased considerable. Apart from money dispenser, ATM can be used to transfer funds, pay for goods and services, check

account balance and recharge mobile phone online. This is shown in

the Table 2.1with the trend within the years of study (2006 – 2013).

Table2.1: Volume and Value of ATM Usage (2006 – 2013)

Year	Volume (Million)	Value(₦'Billion)
2006	10.9	60.53
2007	15.7	131.6
2008	60.4	399.6
2009	109.6	548.6
2010	186.2	954.0
2011	347.6	1,561.8
2012	375.5	1,984.7
2013	295.3	2,828.9

Source: CBN Annual Reports & Statement of Accounts

b. **Debit and Credit Cards:** Otherwise known as plastic money,

debit and credit cards are electronic cards which carry monetary

value and so could be used to settle obligations. With debit

cards, purchases and cash withdrawals are charged directly to

the accounts of holders. Worldwide examples of debit cards

include VISA, MasterCard, Euro card and American Express

etc. Some local variants of debit cards in Nigeria include;

Valuecard, Smart pay, EasyCash Card etc.

International card companies particularly, VISA and MasterCard are expanding their presence in Nigeria by allowing Nigerian banks as members. Owing to growing public awareness, the volume and value of dollar denominated transactions through electronic cards in Nigeria rose significantly from 40,843 and US$10.74 million respectively, in 2005 to 139,011 and US$36.29 million in 2006 (CBN, 2007).

Credit cards on the other hand, allow the holder to undertake purchase and/or make cash withdrawals up to an agreed limit. The credit is later settled partially or in full depending on the terms of the contract. MasterCard in partnership with Cards Technology Limited and Ecobank introduced credit card in Nigeria in 2004. Ecobank again introduced the Naira Credit Card in 2006 (CBN, 2007).

c. **Telephone Banking:** This is referred to as tele-banking. Tele-banking devices allow customers to transact banking business over the phone. It has numerous benefits for both customers and banks. As far as the customersareconcerned, it provides increased convenience, expanded access and significant time

saving. On the other hand, from the banks' perspective, the costs of delivering telephone-based services are substantially lower than those of branch based services. It provides retail banking services even after bankinghours (24 hours a day); it accrues continualproductivity for the bank. It offers retail bankingservices to customers at their offices/homes as analternative to going to the bankbranch/ATM. This saves customers time, and gives more conveniencefor higher productivity.

Table 2.2: Volume and Value of Telephone (Mobile) Banking (2006 – 2013)

Year	Volume (Million)	Value (₦'Billion)
2006	0.04	0.11
2007	0.7	0.15
2008	3.2	0.70
2009	1.8	1.26
2010	1.2	6.7
2011	1.9	20.5
2012	1.5	31.5
2013	15.8	142.8

Source: CBN Annual Reports & Statement of Accounts

d. **Personal Computer (PC) Banking:** PC allows the banks' customers to access information about their accountsvia a proprietary network, usually with the help ofproprietary software installed on their personalcomputer. Once access is gained, the customer canperform a lot of retail banking functions. Theincreasing awareness of the importance of computerliteracy has resulted in increasing the use of personalcomputers. This certainly supports the growth of PCbanking which virtually establishes a branch in thecustomers' home or office, and offers 24-hours service, seven days a week. It also has the benefitsof Telephone Banking and ATMs (Dauda&Akingbade, 2011).

e. Internet Banking: Thisis the main vehicle for Public Access Computing (PAC).Internet offers an excellentenvironment for banks to experiment with the deliveryof home banking (Bill, 1996).It has been used todevelop virtual reality bank branches in the UnitedStates of America. A prototype of this is theElectronic Courtyard developed by the GlobalPayment System Visa and the US software firmWorlds Inc. It allows customers to check accountbalances, transfer funds and apply for loans. It uses three-dimensional graphics to enable customerstomove into different rooms and communicate withvirtual

bank tellers, loan arrangers and financialadvisers. It uses visa remote banking subsidiary, visainteractive, to link banks with customers and providesecure technology for the safety of account datatransferred (Agboola, 2006).

Payments through the internet and mobile phones have gained a lot of prominence with the widespread use of the GSM and the adoption of internet banking operations. Banks now partner with telecommunications companies to offer mobile payments services. Services such as balance enquiry and funds transfer have become common feature. Similarly, internet payments were encouraged by agencies such as the Joint Admission and Matriculation Board (JAMB), which started e-registration using single purposes stored value card, also West African Examination Council (WAEC), National Examination Council (NECO), and some higher institutions initiated payment through the web. Currently, airlines, businesses, corporations/ministry, departments and agencies (MDAs) such as Corporate Affairs Commission (CAC), Nigerian Immigration Service etc. accept payments through the web (CBN, 2007). The growth in the volume and value of web banking are shown in the Table 2.3.

Table 2.3: Volume and Value of Internet (Web) Banking (2006 – 2013)

Year	Volume (Million)	Value (₦'Billion)
2006	0.3	0.41
2007	0.9	10.6
2008	1.6	25.1
2009	2.7	84.2
2010	7.2	99.5
2011	3.6	58.0
2012	2.3	31.5
2013	2.9	47.3

Source: CBN Annual Reports & Statement of Accounts

f.**Electronic Funds Transfer at Point of Sale (EFTPOS):** Thisis an on-line system that allows customersto transfer funds instantaneously from their bankaccounts to merchant accounts when makingpurchases (at purchase points). A POS uses a debitcard to activate an Electronic Fund Transfer Process(Chorafas, 1988). Increased banking productivityresults from the use of EFTPoS to service

customersshopping payment requirements instead of clericalduties in handling cheques and cash withdrawals forshopping. Furthermore, the system continues afterbanking hours, hence continual productivity for thebank even after banking hours. It also savescustomers time and energy in getting to bankbranches or ATMs for cash withdrawals which canbeharnessed into other productive activities.This is illustrated in the Table 2.4.

Table 2.4: Volume and Value of POS(2006 – 2013)

Year	Volume (Million)	Value (₦'Billion)
2006	0.76	20.2
2007	0.42	6.44
2008	1.2	16.1
2009	0.9	11.0
2010	1.1	12.7
2011	2.1	31.0
2012	2.6	48.0
2013	9.4	161.0

Source: CBN Annual Reports & Statement of Accounts

2.1.5 Performance Evaluation

The word "performance" is viewed from different perspectives; one view is concerned with record of outcomes achieved, that is, performance is regarded as accomplishments. Another view is that performance is about doing the work which is behavioral in nature. According to Akintonde, (2013) performance is a multi-dimensional construct, the measurement of which varies depending on whether the measurement objective is to assess performance outcomes or behaviour. Nnabuife, (2009) sees performance as individual efforts that will lead to a specific outcome that will be matched with the expected reward by managers. Armstrong, (2004) defines performance as the outcomes of work because they provide the strongest linkage to the strategic goals of the organization, customer satisfaction, and economic contributions. Performance could be regarded as behaviour, that is, the way in which organizations, teams and individuals get work done (Akintonde, 2013). It is the act or process of performing a task, an action that involves a lot of effort, or how well or badly something is carried out.

Akintonde, (2013) views performance thus:

Performance means both behaviours and results. Behavioursemanate from the performer and transform performance fromabstraction to action. Not just the instruments for results, behavioursare also outcomes in their own right – the product of mental and physical effort applied to tasks – and can be judged apart from results.

This definition embraces both the behaviour and outcome, and indicates that when managing the performance of teams and individuals both inputs (behaviours) and output (results) needs to be considered. That is, there is the need for performance evaluation, assessment or appraisal which assists management to plan, control activities and to make viable economic financial decisions which is the objectives of the organization as a whole to be met (Adeniyi, 2011).

The term "performance appraisal" otherwise referred to as performance assessment, performance review, performance evaluation, etc. is describes by Nnabuife, (2009) as an analysis of overall capacity, potential and total evaluation process carried out to assess an organizational status in terms of being where it is supposed to be. Akintonde, (2013) is of the opinion that performance assessment helps to determine what management or a personnel had accomplished,

which approaches provided the best results and the degree to which one can reach his/her career goals. Performance assessment is an improvement in performance through careful design and feedback, but merely to audit it or judge it. Adeniyi, (2011) suggests that performance evaluation method ideally should promote goal congruence, encourage long-run and short-run views, provide relevant and regular feedback to management and encourage initiative and motivation.

Organization performance evaluation or appraisal can be viewed from both financial and non-financial. Pandey, (2010) and Adeniyi, (2011) emphasize that management and other stakeholders measure or evaluate the overall financial performance of a firm through its audited financial statements which shows the results of the firm's business operating circle within a year and to identify firm's strengths and weaknesses; consequently, financial analysis is the starting point for making plans, before adopting any advanced forecasting and planning techniques. Understanding the past is a pre-requisite for anticipating the future.

2.1.5.1Bank Performance

Banks have various stakeholders whose diverse interests and expectations often weigh-in on banking performance assessment. Like other form of performance assessments, banking sector performance assessment raises the issue of selectivity (Okafor, 2011).

The management of a firm/bank would be interested in all areas of the financial analysis; it is their duties to make the effective and efficient use of their firm's resources in their quest for optimization attainment. Shareholders (investors), who have invested their resources in the company, are most concerned about the organization's profitability. They have assurance in those companies that indicate stable growths in earning (Adeniyi, 2011). Seeing that, they focus on the analysis of the firm's current and potential earnings (Pandey, 2010). Suppliers of long-term debt concentrate on the long-term and short-term solvency; they evaluate the firm's profitability over time, its ability to generate cash to be able to pay interest and repay the principal sum at maturity and the relationship between various sources of funds- capital structure relationship (Pandey, 2010).

On the other hand, depositors are concerned with the bank's ability to meet their claims over a very short period of time. Their analysis will, therefore, be restricted to the assessment of the bank's liquidity position (Adewoyin, 2011). The government is interested in profitability to assess tax liabilities, survival and to ensure economic development. Employees are interested in stability and survival of the bank, in which their jobs and wages and salaries depend; while customers focused on the company's continued existence to maintain supplies possibly at reduce cost without compromising standard (Adeniyi, 2011). All these can be ascertained through financial analysis of the firm's audited financial statements.

To understand how well a bank is doing, we need to start by looking at a bank's income statement, the description of the sources of income and expenses that affect the bank's profitability (European Central Bank, 2010). Operating income is the income that comes from a bank's ongoing operations. Most of a bank operating income is generated by interest on its assets, particularly loans. Noninterest income is generated partly by service charges on deposit accounts, but the bulk of it comes from the off-balance-sheet activities, which

generate fees or trading profits for the bank. Operating expenses are the expenses incurred in conducting the bank's ongoing operations. An important component of a bank's operating expenses is the interest payments that it must make on its liabilities, particularly on its deposits. Just as the interest income varies with the level of interest rates, so do interest expenses. Noninterest expenses include the costs of running a banking business: salaries for tellers and officers, rent on bank buildings, purchases of equipment such as desks and vaults, and servicing costs of equipment such as computers. Other item listed under operating expenses is provisions for loan losses. When a bank has a bad debt or anticipates that a loan might become a bad debt in future, it can write up the loss as a current expense in its income statement under the "provision for loan losses" heading.

According to European Central Bank (2010), profitability is a bank's first line of defense against unexpected losses, as it strengthens its capital position and improves future profitability through the investment of retained earnings. An institution that persistently makes a loss will ultimately deplete its capital base, which in turn puts equity and debt holders at risk. Moreover, since the ultimate purpose of any

profit-making organization is to preserve and create wealth for its owners, the bank's return on equity (ROE) needs to be greater than its cost of equity in order to create shareholder value.

Although banking institutions have become increasingly complex, the key drivers of their performance remain earnings, efficiency, risk-taking and leverage. While it is clear that a bank must be able to generate "earnings", it is also important to take account of the composition and volatility of those earnings. "Efficiency" refers to the bank's ability to generate revenue from a given amount of assets and to make profit from a given source of income. "Risk-taking" is reflected in the necessary adjustments to earnings for the undertaken risks to generate them. "Leverage" might improve results in the upswing – in the way it functions as a multiplier – but, conversely, it can also make it more likely for a bank to fail, due to rare, unexpected losses.

There are a multitude of measures used to assess bank performance with each group of stakeholders having its own focus of interest. From the investors point, although net income/profit gives us an idea of how well a bank is doing, it suffers from one major

drawback. It does not adjust for the bank's size, thus making it hard to compare how well one bank is doing relative to another. A basic measure of bank profitability that corrects for the size of the bank is the return on assets (ROA). ROA is a useful measure of how well a bank manager is doing on the job because it indicates how well a bank's assets are being used to generate profits.

$$ROA = \frac{\text{Net income}}{\text{Total Assets}}$$

The bank's owners (equity holders) are more concerned about how much the bank is earning on their equity investment, an amount that is measured by the return on equity (ROE), the net income per naira of equity capital.

$$ROE = \frac{\text{Net income}}{\text{Capital}}$$

According to Okafor (2011), a multi-dimensional approach is definitely most appropriate for banking performance evaluation and assessment rating. The approach is adopted by the CBN and the NDIC, which apply the CAMEL rating system, developed by the Basel Committee on Banking Supervision of the Bank for International Settlement (BIS) for bank performance assessment. The acronym

(CAMEL) stands for Capital adequacy, Assets quality, Management efficiency, Earnings and Liquidity. A sixth factor, Sensitivity to market risks is often added to expand the acronym to CAMELS. The Bank of Ghana adopts a seven dimensional bank performance assessment performance − CAMRRAL, an acronym which stands for Capital adequacy, Asset quality, Management competence, Risk concentration, Regulatory compliance, Accounting/internal control and Liquidity.

2.2   Theoretical Framework

There is no doubt that commercial banks play animportant role in the economic development of anynation. The need for efficiency and effectiveness inthe running of the banks as leading players in thecohort of financial services providers of a nationthus cannot be overemphasized. Recent advances inthe technological world giving birth to theemergence of Information and Communication Technology (ICT) has led to remarkable changesin the ways businesses are run in contemporary times (Binuyo & Aregbeshola, 2014).

Considering the dynamism of ICT as the drivers of economies across the globe, and notable that theworld has moved currently to a knowledge-basedeconomy of which the ICT has become one of

theprincipal driving forces many theories have been discovered to support it. Some of these theories that are relevant to this study are discussed.

2.2.1 Diffusion of Innovations (DOI) Theory

Diffusion of innovations is a theory that seeks to explain how, why, and at what rate new ideas and technology spread through cultures (Rogers, 2003). Rogers argues that diffusion is the process by which an innovation is communicated through certain channels over time among the participants in a social system. According to Rogers (2003), four main elements influence the spread of a new idea: the innovation itself, communication channels, time, and a social system. This process relies heavily on human capital. The innovation must be widely adopted in order to be self-sustained. Within the rate of adoption, there is a point at which an innovation reaches critical mass.

Table 2.5: Key Elements in Diffusion Research

Element	Definition
Innovation	Innovations are a broad category, relative to the current knowledge of the analyzed unit. Any idea,

practice, or object that is perceived as new by an individual or other unit of adoption could be considered an innovation available for study (Rogers, 2003)

Adopters	Adopters are the minimal unit of analysis. In most studies, adopters are individuals, but can also be organizations (businesses, schools, hospitals, banks, etc.), clusters within social networks, or countries (Meyer, 2004).
Communication channels	Diffusion, by definition, takes place among people or organizations. Communication channels allow the transfer of information from one unit to the other (Rogers, 2003). Communication patterns or capabilities must be established between parties as a minimum for diffusion to occur.
Time	The passage of time is necessary for innovations to be adopted; they are rarely adopted instantaneously. In fact, adoption may occur over more than ten years (Rogers, 2003).

Social system	The social system is the combination of external influences (mass media, organizational or governmental mandates) and internal influences (strong and weak social relationships, distance from opinion leaders). There are many roles in a social system, and their combination represents the total influences on a potential adopter.

Source: Diffusion of Innovations (Rogers, 2003)

2.2.1.1 Innovation Adopters Categories

Figure 2.1: Categories of Innovation Adopters
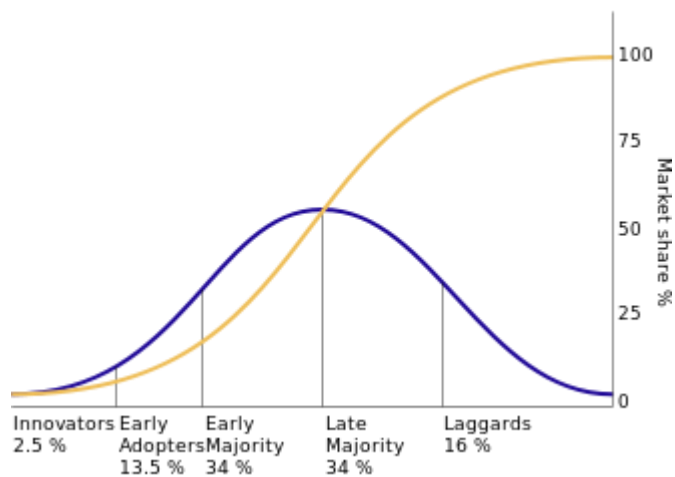
Source: Diffusion of Innovation (Rogers, 2003)

The categories of adopters as shown in Figure 2.1 are: innovators, early adopters, early majority, late majority, and laggards. Rogers (2003) defines an adopter category as a classification of individuals within a social system on the basis of innovativeness. He suggests a total of five categories of adopters in order to standardize the usage of adopter categories in diffusion research. Diffusion manifests itself in different ways in various cultures and fields and is highly subject to the type of adopters and innovation-decision process. In addition to the gatekeepers and opinion leaders who exist within a given community, change agents may come from outside the

community. Change agents bring innovations to new communities–first through the gatekeepers, then through the opinion leaders, and so on through the community.

Table 2.6: Innovation Adopter Categories

Adopter category	Definition
Innovators	Innovators are willing to take risks, have the highest social status, have financial liquidity, are social and have closest contact to scientific sources and interaction with other innovators. Their risk tolerance allows them to adopt technologies that may ultimately fail. Financial resources help absorb these failures.
Early adopters	These individuals have the highest degree of opinion leadership among the adopter categories. Early adopters have a higher social status, financial liquidity, advanced education and are more socially forward than late adopters. They are more discreet in adoption choices than innovators. They use judicious choice of adoption to help them maintain a central communication position.

Early Majority	They adopt an innovation after a varying degree of time that is significantly longer than the innovators and early adopters. Early Majority have above average social status, contact with early adopters and seldom hold positions of opinion leadership in a system.
Late Majority	They adopt an innovation after the average participant. These individuals approach an innovation with a high degree of skepticism and after the majority of society has adopted the innovation. Late Majority are typically skeptical about an innovation, have below average social status, little financial liquidity, in contact with others in late majority and early majority and little opinion leadership.
Laggards	They are the last to adopt an innovation. Unlike some of the previous categories, individuals in this category show little to no opinion leadership. These individuals typically have an aversion to change-agents. Laggards typically tend to be focused on "traditions", lowest social status, lowest financial liquidity, oldest among adopters, and in

contact with only family and close friends.

Source: Diffusion of Innovations (Rogers, 2003)

2.2.1.2 Characteristics of Innovations

Studies have explored many characteristics of innovations. Rogers (2003), Greenhalgh, Robert, Macfarlane, Bate and Kyriakidou (2004) identified several characteristics that are common among most studies.

Potential adopters evaluate an innovation on its relative advantage (the perceived efficiencies gained by the innovation relative to current tools or procedures), its compatibility with the pre-existing system, its complexity or difficulty to learn, its trialability or testability, its potential for reinvention (using the tool for initially unintended purposes), and its observed effects. These qualities interact and are judged as a whole. For example, an innovation might be extremely complex; reducing its likelihood to be adopted and diffused, but it might be very compatible with a large advantage relative to current tools. Even with this high learning curve, potential adopters might adopt the innovation anyway.

Studies also identify other characteristics of innovations, but these are not as common as the ones that Rogers lists above. The fuzziness of the boundaries of the innovation can impact its adoption. Specifically, innovations with a small core and large periphery are easier to adopt. Innovations that are less risky are easier to adopt as the potential loss from failed integration is lower. Innovations that are disruptive to routine tasks, even when they bring a large relative advantage, might not be adopted because of added instability. Likewise, innovations that make tasks easier are likely to be adopted. Closely related to relative complexity, knowledge requirements are the ability barrier to use presented by the difficulty to use the innovation. Even when there are high knowledge requirements, support from prior adopters or other sources can increase the chances for adoption.

2.2.1.3 Innovation Adoption Process

Diffusion occurs through a five–step decision-making process. It occurs through a series of communication channels over a period of time among the members of a similar social system. Rogers' five stages (steps) of innovation processes are: awareness, interest, evaluation, trial, and adoption which he later changed to: knowledge, persuasion,

decision, implementation, and confirmation. However, the descriptions of the categories have remained similar.

Figure 2.2: Stages in Decision Innovation Process

Five Stages in the Decision Innovation Process

| Knowledge | Persuasion | Decision | Implementation | Confirmation |

| Reject |

| Accept |
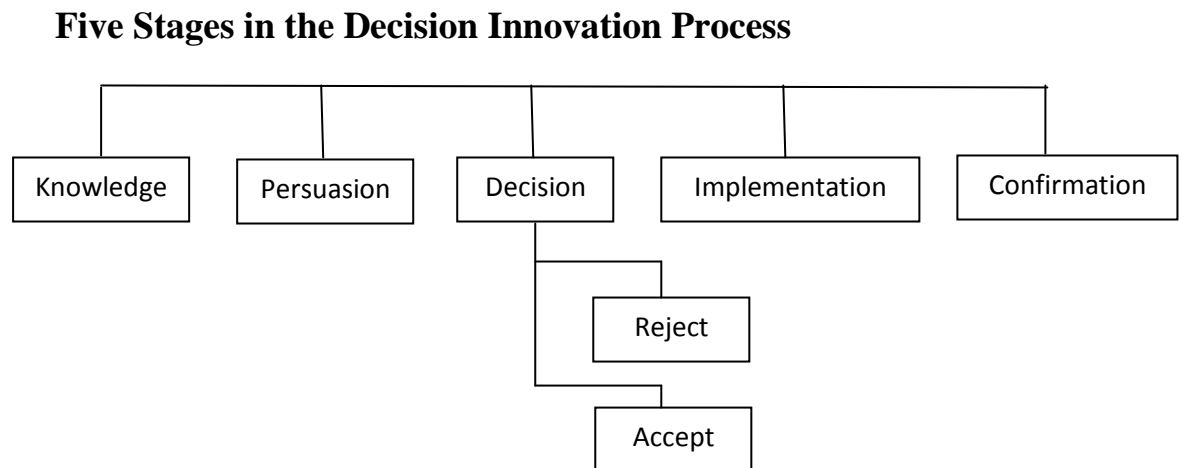
Source: Diffusion of Innovations (Rogers, 2003)

Table 2.7: Five Stages in the Decision Innovation Process

Stage	Definition
Knowledge	The individual is first exposed to an innovation, but lacks information about the innovation. During this stage the individual has not yet been inspired to find out more information about the innovation.

Persuasion	The individual is interested in the innovation and actively seeks related information/details.
Decision	The individual takes the concept of the change and weighs the advantages/disadvantages of using the innovation and decides whether to adopt or reject the innovation. Due to the individualistic nature of this stage, Rogers notes that it is the most difficult stage on which to acquire empirical evidence.
Implementation	The individual employs the innovation to a varying degree depending on the situation. During this stage the individual also determines the usefulness of the innovation and may search for further information about it.
Confirmation	The individual finalizes his/her decision to continue using the innovation. This stage is both intrapersonal (may cause cognitive dissonance) and interpersonal, confirmation that the group has made the right

decision.

Source: Diffusion of Innovations (Rogers, 2003)

2.2.1.4 Diffusion of Innovations Model

As earlier stated, DOI is a theory of how, why, and at what rate new ideas and technology spread through cultures, operating at the individual and firm level. DOI theory sees innovations as being communicated through certain channels over time and within a particular social system (Rogers 2003). Individuals are seen as possessing different degrees of willingness to adopt innovations, and thus it is generally observed that the portion of the population adopting an innovation is approximately normally distributed over time (Oliveira & Martins, 2011). Breaking this normal distribution into segments leads to the segregation of individuals into the following five categories of individual innovativeness (from earliest to latest adopters): innovators, early adopters, early majority, late majority, laggards (Rogers 2003). The innovation process in organizations is much more complex. It generally involves a number of individuals,

perhaps including both supporters and opponents of the new idea, each of whom plays a role in the innovation-decision.

Based on DOI theory at firm level (Rogers 2003), innovativeness is related to such independent variables as individual (leader) characteristics, internal organizational structural characteristics, and external characteristics of the organization. (a) *Individual characteristics* describe the leader attitude toward change. (b) *Internal characteristics of organizational structure* includes observations according to Rogers (2003) whereby: "centralization is the degree to which power and control in a system are concentrated in the hands of a relatively few individuals"; "complexity is the degree to which an organization's members possess a relatively high level of knowledge and expertise"; "formalization is the degree to which an organization emphasizes its members' following rules and procedures"; "interconnectedness is the degree to which the units in a social system are linked by interpersonal networks"; "organizational slack is the degree to which uncommitted resources are available to an organization"; "size is the number of employees of the organization". (c) *External characteristics of organizational* refer to system openness.

Figure 2.3: Diffusion of Innovations (DOI) Model
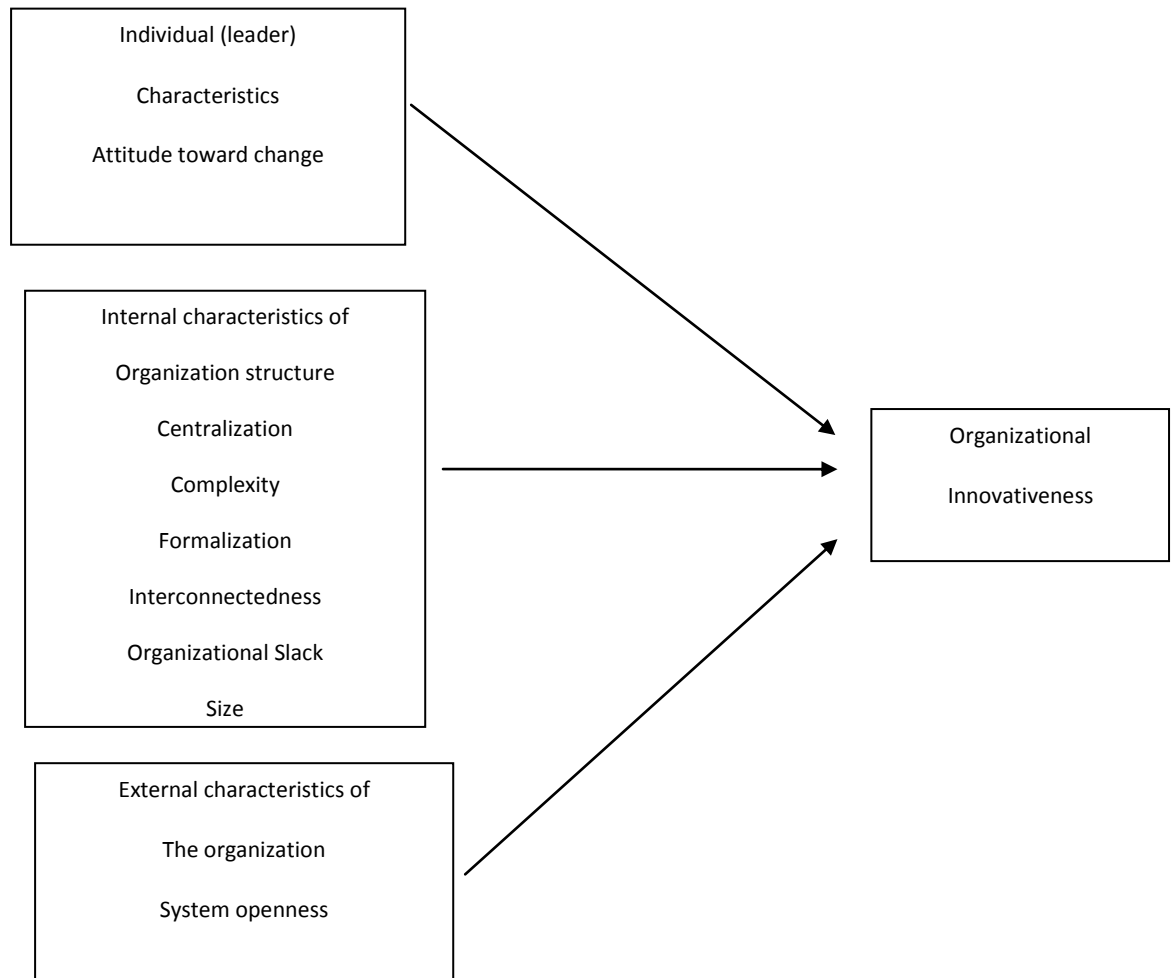
Source: Oliveira, T. and Martins, M.F. (2011)

2.2.2 Technology Acceptance Model

The Technology Acceptance Model (TAM) is an information systemstheory that models how users come to accept and use a technology. The model suggests that when users are presented with a new technology, a number of factors influence their decision about

how and when they will use it. The theory was developed by Davis, Bagozzi and Warshaw (1989). TAM replaces many of theory of reasoned action (TRA) attitude measures with the two technology acceptance measures – ease of use, and usefulness as applicable in diffusion of innovations (DOI). TRA and TAM, both of which have strong behavioural elements, assume that when someone forms an intention to act, that they will be free to act without limitation. In the real world there will be many constraints, such as limited freedom to act (Bagozzi, Davis & Warshaw 1992).

Bagozzi, Davis and Warshaw (1992) say:

> *Because new technologies such as personal computers are complex and an element of uncertainty exists in the minds of decision makers with respect to the successful adoption of them, people form attitudes and intentions toward trying to learn to use the new technology prior to initiating efforts directed at using. Attitudes towards usage and intentions to use may be ill-formed or lacking in conviction or else may occur only after preliminary strivings to learn to use the technology evolve. Thus, actual usage may not be a direct or immediate consequence of such attitudes and intentions.*

Figure 2.4: The Technology Acceptance Model (TAM)
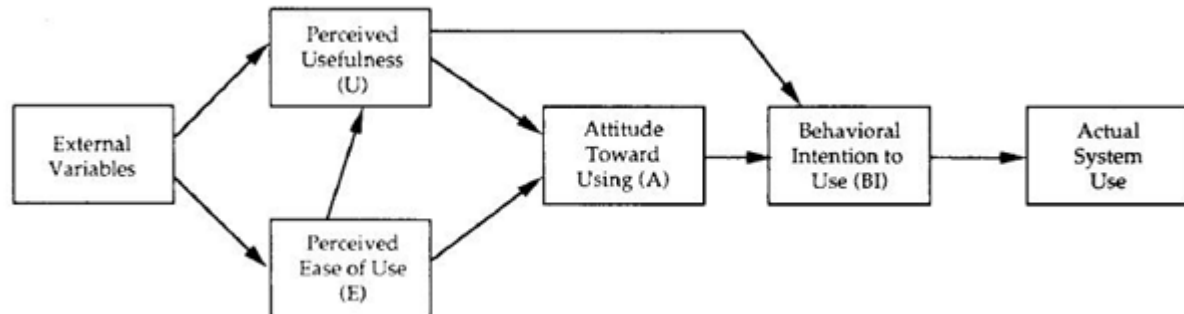
Source: Davis, Bagozzi and Warshaw (1989), FathulWahid (2007)

Perceived usefulness is defined as "a prospective user's subjective probability that using a specific application system will increase job performance within an organization context" (Davis, Bagozzi &Warshaw (1989). Furthermore, the TAM assumes that perceived usefulness will be influenced by perceived ease of use, because, other things being equal, the easier is a technology to use, the more useful it can be.

Perceived ease of use refers to "the degree to which the prospective user expects the target system to be free of effort" (Davis, Bagozzi & Warshaw (1989). By assuming that other variables are constant, the easier is a technology to be used, the higher is its possibility to be adopted by users.

The TAM also assumes that external variables such as characteristics of system design, training, documentation and

characteristics of the decision-maker may also influence technology usage (Davis, et al. 1989). In practical examination, these external variables may manifest in different ways.

Attitude refers toindividual's positive or negative feeling about performing the target behavior (e.g., using a system); while Behavioral intention deals withthe degree to which a person has formulated conscious plans to perform or not perform some specified future behavior. Actual system use is the degree to which an individual believes that using the system will help to attain gains in job performance.

2.2.3 Technology, Organization, and Environment Framework

The technology, organization, and environment (TOE) framework was developed in 1990 by Tornatzky and Fleischer (Oliveira & Martins, 2011). It identifies three aspects of an enterprise's context that influence the process by which it adopts and implements a technological innovation: technological context, organizational context, and environmental context.

(a) *Technological context* describes both the internal and external technologies relevant to the firm. This includes current practices and equipment internal to the firm, as well as the set of available technologies external to the firm.

 (b) *Organizational context* refers to descriptive measures about the organization such as scope, size, and managerial structure, and

 (c) *Environmental context* is the arena in which a firm conducts its business—its industry, competitors, and dealings with the government (Tornatzky &Fleischer 1990).

Figure 2.5:Technology, Organization, and Environment(TOE) Model

External task environment		Organization
Industry Characteristics and		Formal and Informal linking
Market structure		Structures
Technology support	**Technological**	Communication Processes
Infrastructure	**Innovation**	Size
Government regulation	**Decision making**	Slack

Technology

Availability

Characteristics
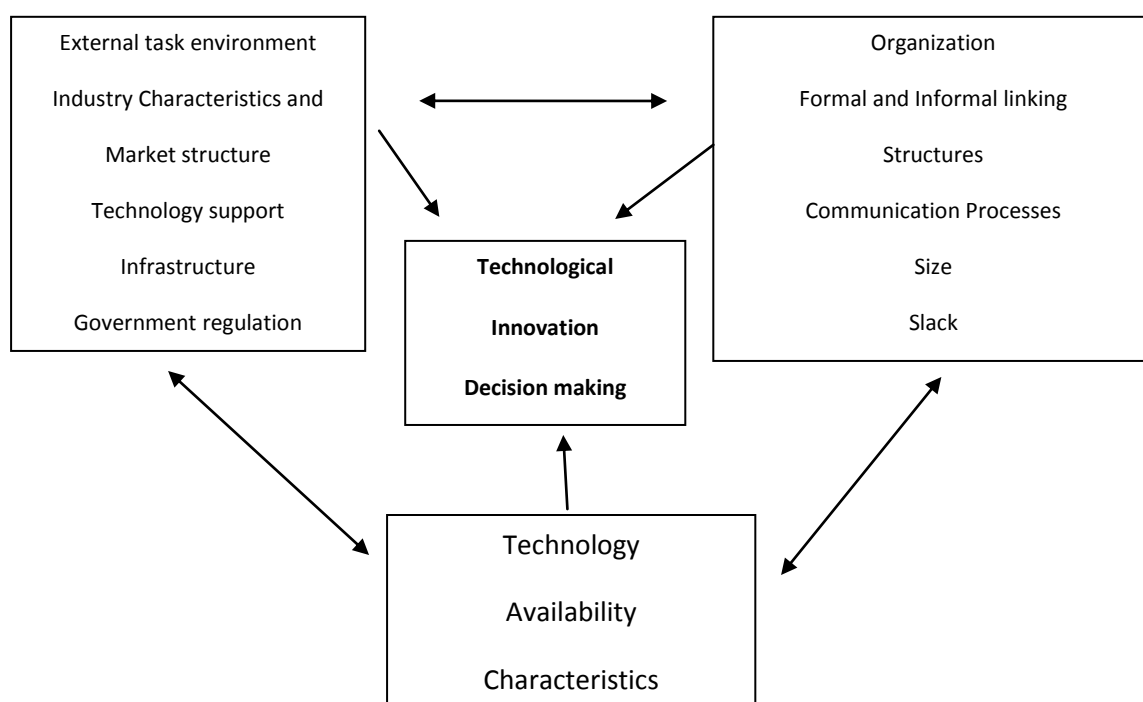
Source: Oliveira, T. and Martins, M.F. (2011)

The TOE framework as originally presented, and later adapted in IT adoption studies, provides a useful analytical framework that can be used for studying the adoption and assimilation of different types of IT innovation. This framework is consistent with the DOI theory, in which Rogers (2003) emphasized individual characteristics, and both

the internal and external characteristics of the organization, as drivers for organizational innovativeness. These are identical to the technology and organization context of the TOE framework, but the TOE framework also includes a new and important component, environment context. The environment context presents both constraints and opportunities for technological innovation.The TOE framework makes Rogers' innovation diffusion theory better able to explain intra-firm innovation diffusion (Hsu, Kreamer, & Dunkle, 2006).

From the above theories, since this study focused on investments in ICT and performance of deposit money banks in Nigeria, it adopts the investments concepts of the theories, that is, Diffusion of Innovations Theory (DOI) by Rogers (2003), Technology Acceptance Model (TAM) by Davis,et al. (1989) and Technology, Organization, and Environment (TOE) framework by Tornatzky, et al. (1990). This is so because; all the theories are interwoven with little area of divergence. Banks as service oriented organisations need to consider many factors within and outside (external) before introducing ICT oriented products in which TAM is of great relevance so as to maximize the huge amount of money being expended on ICT

development and maintenance. In taking technology innovation decision banks must take into consideration the technology to be introduced, the organization and the environment. Proper consideration of these variables will contribute in no small measure to the success of ICT and make the investments worthy. Various factors like the organisation itself, the availability and the characteristics of technology, the external environment which include government regulations/CBN guideline and directives should be seriously considered in banks' investments in ICT. In the same vein Diffusion of Innovation (DOI) theory cannot be whisked away because it is the pivot that all other theories rest. It takes into consideration individual characters which are very germane in banking business. It went further to emphasis how other factors (attitude toward change, internal characteristics of organizational structure, and external characteristics of the organisation, among others) influence the organisation innovativeness. In addition, all these theories have been used by many notable scholars in studies carried out on ICT - it adoption, usefulness, and impact on various aspect of human endeavours, more especially in businesses and commerce.

2.3   Theoretical Studies

2.3.1 Commercial Banking in Nigeria

Commercial banking started in Nigeria in 1892 with the establishment of African Banking Corporation set up by Elder Dempster and Company, a shipping company based in Liverpool. The bank was taken over in 1894 by Bank of British West African (Nwankwo, 1980; Okigbo, 1981) which later became Standard Bank and now First Bank of Nigeria Plc. In 1912, Barclays Bank Dominion, Colonial and Overseas (now Union Bank Plc.) came onboard while British and French Bank Limited (now United Bank for Africa Plc.) was established in 1949.

In the indigenous sector, the National Bank of Nigeria, established on February 11, 1933 was the first successful indigenous bank. The second indigenous bank was the African Continental Bank Limited which started as a private company in 1937 as Tinubu Properties Limited. In 1947, it changed to Tinubu Bank Ltd before it became African Continental Bank Ltd in 1948. The third indigenous bank that survived among numerous others established between 1892 and 1952 (free banking era) was Agbonmagbe Bank Ltd (now Wema

Bank Plc.) established in 1945 as a private company. In 1952, Banking Ordinance was enacted. It was the first time banking business will be regulated in Nigeria, but there was absence of a regulatory bank to give necessary impetus to the working of the law (Nwankwo, 1980).

With the establishment of Central Bank of Nigeria in 1958 and commencement of regulatory and supervision functions in 1959, template was set for regulatory framework to midwife a stable banking system in Nigeria. The period between 1959 and 1985 was referred to as era of banking regulation in Nigeria. There was a systematic growth of commercial banks apart from other specialized banks. The outcome of Financial System Review Committee under Dr. Pius Okigbo in 1976 contributed to the normalcy in the entire financial system in general and commercial banks in particular. There were 28 commercial banks in Nigeria as at 1985 without any symptom of distress and illiquidity.

The introduction of Structural Adjustment Programme (SAP) and the deregulation of the economy including the financial system in 1986 brought a lot of changes into the Nigeria banking system and licensing of more banks. As at December, 1993, there were 65 commercial banks in Nigeria apart from merchant banks, primary mortgage institutions,

community banks (now microfinance banks), finance companies, and bureau-de-change.

In 1994, government policy was changed from total deregulation to guided deregulation of the Nigerian banking system. This system set the upper and lower limits for banks' deposit and lending rates. It was an attempt to regulate the excesses in the financial system caused by unhealthy competition in foreign exchange transactions. In January 1994, license of 26 commercial and merchant banks that were terminally distressed were revoked. The aftermath of this act and the subsequent increase in the minimum capital base of commercial and merchant banks to ₦500 million led to introduction of universal banking system which was practiced for a period of 10 years (2001 to 2010). The introduction of universal banking system led to conversion of 13 merchant banks to commercial banks; hence increase in the number of commercial banks operating in Nigeria

The advent of civil rule in 1999 brought stability to the entire economy in general and the banking sector in particular. There was a steady growth with the existing banks opening new branches and licensing of foreign banks. Minimum share capital was increased to ₦1

billion from ₦500 million and subsequently to ₦2 billion in 2004. With change of headship at the apex bank (CBN) in 2004, all the 89 banks (universal) were directed to increase their minimum share capital to ₦25 billion not later than December 31, 2005. They were given the opportunity to go into merger and acquisition, apart from converting their reserves to capital.

At the end of the exercise in 2005, 25 mega banks emerged out of the 89 banks (a combination of 75 banks), while the remaining 14 banks were liquidated. The development changed the entire Nigerian banking system once and for all. In addition to the above, a thorough analysis of the portfolio of the 25 banks carried out in August 2009 revealed that some of the mega banks were in precarious situation due to insider above and inadequate corporate governance. The discovery led to the sacking of board of directors of 8 banks and setting up of interim management by the CBN and injection of over ₦600 billon as tier-two capital and setting up of Assets Management Company (AMCON) to take over the bubble loans of the affected banks. The step was a bold step to protect banking public from bank failure which would have wiped away billions of innocent depositors' funds.

In January 2011, new banking model which put an end to the era of universal banking was introduced in Nigeria. The regime reintroduced merchant banks and commercial banks with different minimum capital base and scope of operations. Commercial banks were structured into three: International Commercial banks with minimum share of ₦50 billion, National Commercial banks, minimum capital base of ₦25 billion; while Regional Commercial banks are to have ₦10 billion as minimum share capital. In addition to this was the introduction of non-interest commercial banks with minimum share capital of ₦10 billion for national and ₦5 for regional. Merchant banks were to have ₦15 billion as minimum share capital.

The banking reform of 2004/2005 and the intervention of 2009 changed Nigeria banking system significantly. The number of banks in Nigeria have continue to change since then, and as at period of this study (2013), stood at 20 commercial banks (Table 3.1).

2.3.2 ICT and Management Services in Banks

When information is relevant, adequate, accurate and timely, they aid decision-making. Decision Support System (DSS) is a computer system that assists the management decision making by

combining data, sophisticated analytical models and tools, and user friendly software into a single powerful system that can support semi structured or unstructured decision making (Laudon&Laudon, 2001).

Ibraheem (2000), Adewoye (2007) identify various areas in which the application of information technology to banking services has assisted management; these areas include corporate planning, control asset and liability management, legal service, and manpower development. All these have assisted in boosting the value of payoff on IT – investments and invariably banks performance.

2.3.3 ICT and Economic Performance

An increase in Multi-factor productivity means that for a fixed level and quality of inputs, a firm, industry or economy is achieving higher levels of output. This form of productivity improvement is of great importance because it reflects structural gains that are permanent (Adewoye, 2007).This framework also posits that there are complimentary factors that influence the payoff from IT investments.

At the firm levels, these include organization and management practices (Brenahan, Brynolfsson &Hitt, 2002), at the industry level

they include industry organization (Land, 2000), and at the national level, they might include economic structure, government policy, and investment in human capital.Acomprehensive review of the payoffs from IT investments must examine the returns to this investment at the disaggregate level of the firm as well as the aggregate level of industries and the economy.

Brynjofsson and Hitt (1995) estimate that these "firm effects" may account for as much as half of the productivity benefits attributed to IT investments in their earlier work, but stated that the elasticity of IT remains positive and significant even after firm effects are taken into account.

2.3.4 ICT and Bank Performance

The performance of banking sector is very germane to the performance of the economy because of the intermediation role banks play. In intermediation, banks mobilize savings from the surplus units of the economy and channel these funds to the deficits units, particularly private business enterprises for the purpose of expanding their productive capacity. In operating the payments mechanism, the banking system's liabilities serve as agents through which those

policies are implemented. Hence, an efficient and effective banking sector is essential not only for the production of efficient intermediation, but also for the protection of depositors, encouragement of healthy competition, maintenance of confidence in, and stability of the system, and protection against systemic risk and collapse. For banking industry of an economy to achieve these objectives, the industry must be stable, sound and enhance confidence (CBN, 2006).

To achieve these objectives, the regulatory authority (CBN) set up some performance indicators which banks must comply with from time to time.The operational performance is measured in terms of the trends in capital adequacy, banking sector liquidity, credit operations and bank asset quality (Okafor, 2011).

To ensure compliance, the CBN adopts various approaches in its supervisory and surveillance activities, including regular appraisal and review of banks' periodic returns, spot checks, monitoring, special investigations and risk-based/consolidated supervision (CBN, 2010). To further improve the efficiency of supervision, the CBN through the use of ICT embarked on the development of a supervisory framework

aimed at providing an early warning signal to supervisors about the condition of banks for prompt corrective actions.

In the same way, banks managements are able to co-ordinate, supervise and monitor the activities in various branches promptly with development in ICT, which has promoted early detection of frauds and forgeries. From the investors/public perspectives, banks performance can be measured in term of efficiency in service delivery, quality of products, returns on investments, return on assets, return on equity, and dividend payment among others. With development in ICT, there has been a great improvement in assessment process and procedures.

2.3.5 ICT and Nigeria's Payments System

The Nigeria's payments system (NPS) has been significantly influenced by financial liberalization and deregulation across international borders as well as the remarkable progress made in information and communication technology (ICT). Given the crucial role of the payments system as a channel through which financial resources flow from one segment of the country to the other, the CBN accorded the payments system due priority in the reform agenda of the financial system. Thus, the Bank in conjunction with other stakeholders channeled resources towards its transformation and

modernization to enhance the safety, efficiency and reliability of the payments system in Nigeria. This effort culminated in the introduction of institutional arrangements, operational mechanisms, interrelated information technology infrastructure and instruments that are widely gaining acceptability among service consumers in banking industry (CBN, 2007).

i. Clearing System: Concrete steps towards modernizing the payment system began with the introduction of the National Automated Clearing System (NACS) based on the magnetic ink character recognition (MICR) technology. A centralized automated clearing process was established and became operational in the Lagos clearing zone in October 2002 and was extended to Abuja in March 2005. Hitherto, the processing of cheques and computations of the net settlement position of banks were done manually. Enabled by MICR reader sorters, necessary information on cheques were captured, buildinto clearing files and electronically transmitted to the clearing house, from where the net settlement position of participating banks were automatically computed and also electronically transmitted to the CBN for final settlement. Thus, automation revolutionized the cheque

clearing system and provided the veritable platform for the development of electronic payments and settlement, such as electronic card transactions as well as paper based instruments. Furthermore, since the adoption of the new system, the clearing cycle for local and up-country instruments was reduced from 9 and 5days to 6 and 3 days, respectively.

Further enhancement of ICT led to the reduction of clearing cycles for up-country cheques from transaction day (T), T + 5 to T + 3, while the clearing cycle for local cheques remained at T + 2. To further improve the efficiency and timeliness of cheque clearing in Nigeria, the CBN introduced cheque truncation. The implementation of the initiative in 2013, harmonized the clearing cycles for up-country cheques and local cheques were to T + 2. With stability in the initiative, the clearing circle has been harmonized to T + 1; that is, transaction day plus one working day. The rationale behind the policy is to improve the efficiency of cheque clearing and ensure faster settlement of cheques by eliminating the cumbersome process of exchanging physical cheques amongst clearing banks.

Table 2.8 gives a picture of improvement in the use of cheque as medium of payment. The reduction in the volume and value of cheque clearing in 2013 may not be unconnected with improvement in the use of ICT based devices.

Table 2.8: Volume and Value of Cheques Cleared (2006 – 2013)

Year	Volume (Million)	Value (₦'Billion)
2006	14.927	16,492.1
2007	19.895	28,111.2
2008	30.172	43,357.4
2009	29.159	29,390.9
2010	33.986	19,687.9
2011	37.718	22,302.6
2012	37.236	19,802.1
2013	29.400	15,600.0

Source: CBN Annual Reports & Statement of Accounts.

2.3.6 ICT Application and the Nigeria Banking Industry

The banking industry in Nigeria has witnessed tremendous changes linked with the developments in ICT over the years. The quest for survival, global relevance, maintenance of existing market share and sustainable development has made exploitation of the many advantages of ICT through the use of automated devices imperative in the industry (Agboola, 2006).Irechukwu (2000) lists some banking

services that have been revolutionized through the use of ICT as including account opening, customer account mandate, and transaction processing and recording. Information and Communication Technology has provided self-service facilities (automated customer service machines) from where prospective customers can complete their account opening documents direct online. It assists customers to validate their account numbers and receive instruction on when and how to receive their cheque-books, credit and debit cards. Communication Technology deals with the Physical devices and software that link various computer hardware components and transfer data from one physical location to another (Laudon&Laudon, 2001).

ICT have contributed to the distribution channels and networking of Nigerian Banks. The electronic delivery channels are collectively referred to as Electronic Banking. Electronic Banking is reallynot one technology, but an attempt to merge several different technologies. Information and Communication Technology (ICT) may be viewed in different ways. The World Bank defines ICT as "the set of activities which facilitate by electronic means the processing, transmission and display of information" (Alu, 2002). ICTs "refer to

technologies people use to share, distribute, and gather information and to communicate through computers and computer networks" (Laudon&Laudon; 2001).

ICT can be described as a complex varied set of goods, applications and services used for producing,distributing, processing, transforming information- (including) telecoms, TV and radio broadcasting,hardware and software, computer services and electronic media (Laudon&Laudon; 2010). ICT represents a cluster of associated technologies defined by their functional usage in informationaccess and communication, of which one embodiment is the Internet.ICT affects financial institutions by easing enquiry, saving time, and improving service delivery. In recent decades, investment in IT by commercial banks has served to streamline operations, improvecompetitiveness, and increase the variety and quality of services provided. According to Yasuharu (2003), implementation of information technology and communication networking has brought revolution in the functioning of the banks and the financial institutions. It is argued that dramatic structural changes are in store for financial

services industry as a result of the Internet revolution; others see a continuation of trends already under way.

Many banks are making huge investments in technology to maintain and upgrade their infrastructure, in order not only to provide new electronic information-based services, but also to manage their risk positions and pricing. At the same time, new off-the-shelf electronic services such as online retail banking are making it possible for very small institutions to take advantage of new technologies at quite reasonable costs. These developments may ultimately change the competitive landscape in the financial services.ICT facilitated the networking of banks branches and to other banks within and outside the nation. Computerization and inter-connection of geographically scattered stand-along banks branches and other banks at national and global levels into one unified system in the form of a Wide Area Network (WAN) or Enterprise Network (EN); for the creating and sharing of consolidated customer information/records.

It offers quicker rate of inter-branch transactions as the consequence of distance and time are eliminated. Hence, there is more productivity per time period. Also, with the several networked

branches serving the customer populace as one system, there is simulated division of labour among bank brancheswith its associated positive impact on productivity among the branches. Furthermore, as it curtailscustomer travel distance to bank branches it offers more time for customers' productive activities.

Technological innovation such as the use of computer automation and electronic banking influences speed of bank services delivery, enhanced management decision making and saving time (Alu, 2002). Information and Communication Technology has provided self-service facilities (automated customer service machines) from where prospective bank customers can complete their account opening documents direct online. It assists customers to validate their account numbers and receive instruction on when and how to receive their cheque books, credit and debit cards (Agboola, 2001).

Thus, Technological Innovation deals with the Physical devices and software that link various computer hardware components and transfer data from one physical location to another (Laudon&Laudon; 2001, 2010). ICT products in use in the banking industry include Automated Teller Machine, Smart Cards, Telephone Banking, MICR,

Electronic Funds Transfer, Electronic Data Interchange, Electronic Home and Office Banking. Electronic Banking has tremendously improved the services of banks to their customers (Agboola, 2001).

Innovations in information processing, telecommunications, and related technologies – known collectively as "information technology" (IT) – are often credited with helping fuel strong growth inmany economies (Coombs&Walsh1987). It seems apparent then that, technological innovation affectsnot just banking and financial services, but also the direction of an economy and its capacity for continued growth. Information and communication technology (ICT) have always played a very important role in human life. However, in the mid-20th century, the role of information increased immeasurably as a result ofsocial progress and the vigorous development in science and technology. In addition, as (LaudonandLaudon; 2010) has pointed out, rapid expansion of a mass of diversified information is occurring, whichhas received the name "information explosion".

Today, a variety of ICT products are increasingly being used in the banking industry of the developing countries in response to increased sophistication of the customers and greater competition

emanating from the increased globalization of the financial services industry. These productsinclude Automated Teller Machines (ATMs), telephone banking, MICR cheques, Electronic Funds Transfer, Electronic Data Interchange, Electronic Home and Office Banking, Electronic Fund Transfer at Point of Sale, Electronic Letter of Credit, Electronic Card, Debit Card, Electronic Cash,Electronic Billing, Local Area Network, Wide Area Network, etc. (Agboola 2006).

2.3.7 ICT and Cashless Policy

Cashless policy involves carrying out transactions without necessarily using physical cash as a means of exchange for transaction but rather with the use of credit or debit card for payment of goods and services. It is a development in line with Nigeria payment systems vision 2020 and in line with implementation of the financial system strategy (FSS 2020) vision and objectives.The information and communications technology's vision was borne out of the need to use ICT as an enabler to make financial services available to everyone, every time and everywhere. Towards this, technology is being used to develop and support an accessible, secure, reliable, affordable and

collaborative financial system. ICT development is the bedrock of financial system development viz-a-viz cashless policy.

FSS 2020 Information and communication technology objectives include:

i. Create legal and regulatory framework for electronic business transactions.

ii. Develop frameworks, guidelines and standards to enable IT driven/based reporting, compliance, monitoring and risk management.

iii. Develop a future-proof technology infrastructure to make financial service available nationwide (special attention on non-bank individuals and rural communities).

iv. Design and implement a robust security framework and operational infrastructure.

v. Establish a framework for adapting internationally accepted standards to meet local needs for information sharing and interoperability.

vi. Implement e-Governance to provide public service online (e-Governance).

vii. Develop an online 'virtual data warehouse' that dynamically collates information from different systems that are within and outside the financial system industry (FSI) and presents the gathered information in a user-friendly format.

viii. Develop a robust research and development service for ICT utilizationin the economy.

ixBuild human capacity and sustained awareness for ICT utilization(FSS2020, 2013).

With robust ICT policy in place and level of embracement by banks and other financial institutions, the CBN in line with its vision to be one of the most efficient and effective world's central banks in providing and sustaining economic development came out with cashless policy. The mission is to facilitate economic activities by providing safe and efficient mechanisms for making and receiving payments with minimum risks to the Central Bank, payment service providers and end users. To extend the availability and usage to all sectors and geographies, banked and unbanked and conform to internationally accepted regulatory, technical and operational standards.The main trust of cashless policy was to reduce the amount

of Naira notes and coins (cash) used for business. But not to eliminate cash usage and enhance the use of other payments options as obtained in other progressive countries of the world where there are other payments options like debit and credit cards, bank transfers, bank direct debits, automated teller machines (ATMs), and even mobile phone money. The policy aimed at improving the effectiveness of monetary policy in managing inflation and driving economic growth.

The policy will curb some of the negative consequences associated with the high usage of physical cash in the economy, including:

i.   **High Cost of Cash:** There is a high cost of cash along the value chain – from CBN and the banks, to corporations and traders; everyone bears the high costs associated with volume cash handling.

ii. **High Risk of Using Cash:** Cash encourages robberies and other cash related crimes. It also can lead to financial loss in the case of fire and flooding incidents.

iii. **High Subsidy:** With high volume of cash transactions, CBN statistics indicated that much money is used daily on notes

and coins. The large cash transactions are carried out by very few individuals, hence banking population subsidizes the cost that the tiny minority incurred in terms of high cash usage.

iv. **Informal Economy:** High cash usage results in a lot of money outside the formal economy, thus limiting the effectiveness of monetary policy in managing inflation and encouraging economic growth.

v. **Inefficiency and Corruption:** High cash usage enables corruption, leakages and money laundering, amongst other cash-related fraudulent activities.

The benefits of cashless policy cut across all stakeholders. For consumers, it gives room for increased convenient, more service options; reduced risk of cash-related crimes; cheaper access to (out-of-branch) banking services and access to credit. For corporations, there is access to capital; reduction in revenue leakage; and reduced cash handling costs. For government, the benefits include increased tax collections; greater financial inclusion; increased economic development.

2.4   Empirical Studies

2.4.1 Study of Electronic-banking Services and Bank Performance

ATMs have extended banking services to the remote areas depositing and withdrawal of funds were carried out in rural areas in Ghana. This has enabled loading and unloading of cash in small communities or in widespread communities where people gather, however real cash ATMs for general use and deposit would require more servicing and more security (Morris-Cotterill, 2002). Cracknell (2004) reported that Malawi Central Bank established a smart card infrastructure with biometric enabled ATMs with an aim of reducing insecurity within the banking industry, with the use of such developments on the ATMs, withdrawal and depositing of cash is now done safely thus yielding positive results. According to Anguelov, Higert, and Hogarth (2004), e-funds transfer is defined as the movement of money or credits from one account to another through an electronic medium. E-funds transfer has features such as direct deposit, an ATM or debit card among the rest. In this study e-funds transfer technology means the availability, accessibility and usage of ATM

cards, debit cards, credit cardsand e-cheques with reference to cash deposit, cash withdrawal and account balance inquiry.

Several researchers indicated that the use of e-funds transfers technologies such as ATMsand e-cheques have shown positive response. For example (Wucker, 2004) explained that in Latin America, migrant workers use ATMs to send money home in which members of their families can easily withdraw funds. This therefore makes it easier for the migrant workers to send cash easily to their families at cheaper costs using banking services. In this way, customers are able to withdraw and deposit cash easily as compared to the former days when the use of such services wasnot available. Gourlay and Pentecost (2005) explained that funds are transferredelectronically using ATMs to provide retail banking services allowing 24 hours a daycash withdrawal, balance verification and bill payment at branches and remotelocations away from branches. ATMs in the United Kingdom are seen as a substitute capital forlabour particularly in routine human teller operations. Transaction costs associated withneed to withdraw cash unexpectantly are lowered, (Namirembe, 2007).

ATMs are widely used in transfer of cash. They are mainly located at shopping stationsto help customers in carrying out shopping easily (Organisation for EconomicCorporation and Development, 2003). It is worth noting that electronictransactions can be carried out using e-cheques and e-cash for large amounts of money. There are positive results noted in the use of e-funds transfer with increased use ofATMs and e-cards. According to Arch and Burmeister (2003), in Australia emphasis was placed on e-bankingtechnologies. It was also noted that Australians with visual impairment were introducedto audio-enabled ATMs, through an initiative jointly supported by the NationalAustralian Banks'ATM supplier (Diebold) and Blind Citizens Australia. The first of this was installed atthe Royal Victorian Institute for the Blind premises. This implies that use of e-fundstransfer technology in Australia has enabled the banking industry to provide services toits clients because even the blind can deposit and withdraw their money from thebanking institutions hence indicating a desirable dimension.

2.4.2 ICTAdvancement in Banking Industry

Berger (2002) studied Technological Progress andits Effects on the Banking Industry in the US. It was noted that IT-based deliverysystems like ATMs led to improvements in the banks' performances and consolidation ofthe industry during the deployment of technologies (Berger, 2002). Berger, (2002)further posited that, to establish links between technological progress and theproductivity growth of the banking industry and industry structure multivariate analysisshould be used. Namirembe (2007) carried out empirical study of the influence of ICT on the banking industry in Kampala, findings revealed that telephone banking had a high predictive potentials compared to e-funds transfer and internet banking technology, with low level of ICT integration in the banking industry in Kampala, he recommends that more awareness, implementation and monitoring are essential.

In Uganda, while ATMs are found to have some set-backs such as limited amount offunctionality, queuing and shutting down when they are empty, they have caused anaggressive competition among banks, which has been claimed to have strengthened thebanking

culture in Uganda (Batanda, 2001). The information given byBatanda(2001) was not quantified and the approach followed was not elaborate,which motivated the study carried out by Namirembe (2007) to establish the influence of ICT onthe banking industry in Kampala. Coupled to this is the fact that ATMs are not the onlytechnologies of e-funds transfer other technologies such as credit and debit cards needto be studied to establish true influence of e-funds transfer on the banking industry inKampala.

Karin, Laurie and Dave(2005) evaluated the Efficacy of Credit Card Regulation inUSA and used the elaboration likelihood model to explore how consumers mightrespond to the revised credit card disclosure requirements, focusing specifically oncollege students. Random selection approach was used and it was noted that collegestudents possessed a fairly low level of knowledge of credit cards thus are not very wellequipped to make educated choices concerning such cards. While Karin *et al* (2005) sample of interest was limited to college students; the study used aggregate secondary data in measuring impact of ICT which is more reliable than primary data.

On telephone banking, Bohm, Brown and Gladman (2000) assert that some banks have always accepted instructions bytelephone from trusted customers well known to them, as part of their ordinary branchbanking service. Telephone banking requires a customer and bank to agree at the outsetof the relationship a small category of 'security information' to be used to verify thecustomer's authority to give telephone instructions and usually include a passwordchosen by the customer. Bohm*et al* (2000) define telephonebanking as a service, which the customer can use to give instructions and getinformation by speaking to bank staff by telephone. Telephone banking technology means availability, accessibility and usage of telephones(wired or wireless telephones) to engage in cash deposit, withdrawal and accountbalance inquiry by users in the banking industry.

Al-Ashban and Burney (2001) studied Customer Adoption of Tele-bankingTechnology in Saudi Arabia and found that customers increasingly extend their use oftele-banking as their experience grows with the system and that education played a vitalrole in the adoption and usage of tele-banking technology. While Al-Ashban andBurney indicated that education played an important role in the adoption and

usage oftele-banking,Osabuohien (2008) studied ICT and Nigerian banks reforms, he identified factors such as bankers' age, educational qualification, computer literacy and type of ICT impacts significantly and speed of banking operations, productivity and profitability. Howcroft, Hamilton and Hewer(2002) indicated that educational levels ofrespondents did not affect the usage of telephone banking. Findings of these two studiesreveal conflicting results.

In Nigeria, telephone banking isstrengthened through the mobile telecommunication system and this has enhanced the growth of telephone banking in Nigeria. Agboola (2005) studied ICT in baking operations in Nigeria he discovered that technology has been discovered to be the main driving forces of competition in the banking industry during his period of study. He went further to state that the adoption of ICTin banks has improved customer services, facilitated accurate records, provides for Home and Office Banking services, ensures convenientbusiness hour, prompt and fair attention, and enhances faster services.Idowu, Alu and Adagunodo (2002), studied the effect of information technology on thegrowth of the banking industry in Nigeria. This study concentrated on the use oftechnologies

such as telephone banking technology. It was noted that the use of ICTensured a quick and improved services delivery to customers in Nigeria, thus anindicating desirable outcomes. While the above study showed positive correlation inNigeria, it was carried out prior to the CBN intervention of 2009 when eight banks were taken over which seriously affected the banking landscape in Nigeria; this study is necessary at this point to fill in the gap in ICT development and bank performance.

.   Ayadi (2003) defined Internet banking as a set of systems that enable bank customers to access accounts and general information on bank products and services through a personalcomputer among other intelligent devices or any other activity held on the Internet. He explained further that access to electronic means of payment and the high numberof customers connected to the Internet has changed the perception of banks towardmarket and increased the development of Internet Banking. Hutchinson and Warren(2003) argued that Internet banking requires a sound security procedure thatinvolves designing effective methods via which users can be authenticated in a remoteenvironment such that transactions being conducted are secured

within their respectiveenvironments. Internet banking technology has made remarkable changes in thebanking industry, which include cost reduction due to electronic processing carried outon the Internet. For example in US while the average transaction cost at a full servicebank is about $1.07, it reduces to $0.27 at an ATM and falls to about a penny if thesame transaction is conducted on the web (Nath, Schrick, &Parzinger, 2001). In the same way, Purcell and Toland (2003) opined that the use of the Internet in the banking institutions can give cost advantage by reducing financial transaction costs; middleman-ship; emerge into new products in the financial industry and the construction of expensive websites that can secure financial transactions.

In Nigeria, internet banking and the use of other ICT have greatly increased due to huge amount of money expended on IT by banks and the regulatory directive of N10 million limit on cheque transaction and the promotion of cashless policy. According to Kerem (2003) Internet banking technology has led to the incorporation of new features forsecurity transactions, international payments; viewing credit card statements, depositsand account history, customers can now send e-mails from the bank's home page. Thisimplies that banks can

use websites as means to provide services to customers.According to Buys and Brown (2004), Internetbanking accounts in South Africa recently surpassed one million and continued to riserapidly. There is no wide spread dissatisfaction about the security concern on the use ofInternet banking in South Africa, instead, Internet banking has led to increased customersupport and quickens transactions and payments of customers (Buys & Brown, 2004).

Ezeoha (2005) studied Regulating Internet Banking in Nigeria and noted that thereare security concerns in Internet banking where fraud has become a daily business tosome individuals; Internet banking has remained insignificant due to fraud and forgery,e-banking services are offered in Naira only and that in Nigeria Internet banking maytake a long time to fully become one of the economic relevance in the country bankingpractice because of fraud which has made it complex hence causing few customers totransact their businesses through the Internet. Coupled with that is the development ofbanks websites that did not go beyond information purposes. Poor government measureshave also affected the right environment for Internet banking. This study is necessary to evaluate the development in Nigeria banking

industry after the consolidation of 2005, and the intervention of 2009. The need to know how ICT investments have impacted on Nigerian commercial banks performance is of great importance to the development of banking industry in Nigeria.

2.5   Summary of Review

Chapter two vividly looked at the existing literature on conceptual meaning of information and communication technology, technology innovation and ICT development, the significance of ICT to banking industry in product creations and delivery. It discussed the various ICT based products in banks, and how it (ICT) has revolutionized banking industry in Nigeria in line with globalization. Under the theoretical framework,the study adopts the combinations of Diffusion of Innovations Theory (DOI) by Rogers (2003), Technology Acceptance Model (TAM) by Davis, et al. (1989) and Technology, Organization, and Environment (TOE) framework by Tornatzky, et al. (1990). This is so because; all the theories are interwoven with little area of divergence. DOI theory was proponded by Rogersand it is the pivot on which other theories rest.Diffusion process is the process by which an innovation is communicated through certain channels over

time among the members of a social system. It is a special type of communication, in that the messages are concerned with new ideas.Diffusion is a kind of social change,defined as the process by which alteration occurs in the structure and function of a social system. This shows how the entire society is being revolutionalised through an idea or innovation development. This study presents the various theorieswith illustrations and further makes reference to different scholars that have adopted them in their studies.

The chapter contained theoretical studies and reviewed related empirical studies conducted by other researchers in relation to information and communication technology and their impact on banks' performance.The study also cited the challenges faced by the development of information and communication technology in banking sectors through the works of other researchers and presents different views which are in support and also against the study. But some of the findings of previous empirical research works are no longer valid as a result of lastest development in the banking sector.

Because of the importance of ICT in banking industry, a lot of work had been carried out in the area. Adewoye (2007) carried out a

study on the performance impact of information technology (IT) investments on banking operations in Southwestern Nigeria. The study was to determine the effect of IT investment on productivity and profitability and the evaluation of the effect of management practice on performance of banks. The study was carried out on ten (10) insured pre-merged banks within the Southwestern geopolitical zone of Nigeriain which eight (8) of the banks were chosen from Lagos metropolis via purposeful sampling technique, while the remaining two were chosen outside Lagos. The study employed Cobb-Douglas function; while Chi-square and Kedal coefficient of concordance were used to determine the extent of use of IT devices in the banks. The scope of the study was 2000 – 2004, while data were extracted from the sampled banks financial statements apart from questionnaire and scheduled interview administered on the heads of systems units and engineers in the selected banks. The study revealed that IT investments have increased productivity but have not resulted in supernormal business profitability; rather, there were some evidence of small or negative impact on profitability.

The study scope of five years seems too short for trend analysis, while the sample of ten (10) banks out of 89 banks that were in existence then seems inadequate. In addition, the basis of the selecting 8 banks from Lagos and two others outside Lagos was not representative enough realizing that Southwestern Nigeria had six states. The selection of the samples would affect the outcome significantly. The study failed to define what supernormal profit is.

Namirembe (2007) also carried out a study on the influence of ICT on the banking industry in Kampala; the researcher used quantitative, qualitative correlational and case study research structure. The outcome of the research revealed that telephone banking has a high predictive potential compared toe-funds transfer and internet banking technologies. It was concluded that the predictive potential of ICTs on the banking industry in Kampala was low which implies that there was less integration of ICTs on the banking industry in Kampala. The study recommended that there is need for bank managers to embark on user awareness, implementation and monitoring and evaluation of what is implemented, bearing in mind that it required high financial investment and a critical plan. The study equally came

out with a model of ICT and the banking industry in Kampala that banking industry (cash deposit, cash withdrawal and account balance inquiry) depend on ICT facilities (e-fund transfer technology and telephone banking technology) as independent variables.

The shortcoming of the study was its failure to explain a causal link between ICT and the banking industry. In addition, the unit of study was individual customers leaving behind corporate customers.

Further to the above, Agboola (2006) studied information and communication (ICT) in banking operations in Nigeria – An evaluation of recent experiences. The study evaluated the response of Nigerian banks to the adoption of ICT. The study used degree of adoption of innovative technologies; degree of the identified technologies; and the impact of the adoption of ICT devices on banks operations. The study covered 36 selected banks out of 89 banks in the country as at the end of 2005. The study revealed that the period between 1990 and 2005 was characterized by fundamental changes in the content and quality of banking business in the country. Technology was discovered to be the main driving force of competition in banking industry during the period of study. The study used primary data collected through

questionnaire administered on employees, customers and head of system units of the 36 selected banks respectively. The study was comprehensive enough, but responses to questionnaire may be subjective which may affect the outcome of the study.

This study leveraged on the outcome of the previous research works on the subject matter. Itupdated the development of ICT on banks performance in Nigeria in a post consolidation era (2006 – 2013). It employed secondary data extracted from the audited financial statements of 13 out of 20 commercial banks that were operating in the country within the period of study. The study brought out the level and the significance of the impact of banks' investments on ICT on selected banks performance indices. The use of secondary data makes it more robust and more reliable than earlier studies that were majorly based on primary data collected through questionnaire administered on selected individuals among banks staffs and customers.

CHAPTER THREE

RESEARCH METHODOLOGY

This chapter discussed the design and area of the study, the population studied, the sample and sampling technique adopted for data collection, method of data collection and method of data analysis.

3.1   Research Design

In this study, secondary data were used and non-probability (purposeful) sampling techniquewas adopted. The data have been collected from the CBN,and NDIC annual reports and accounts,and thesampled deposit money banks' annual financial reports, covering the period 2006 – 2013. The data comprised of ICT development cost, ICT maintenance cost, earnings per share (EPS), return on assets (ROA), profit before tax (PBT), profit after tax (PAT) and total deposit(DEP) of the sampled banks.

The study examined investments in ICT and performance ofdeposit money banks in Nigeria. In order to analyze the impact, this study applied multiple regression on the data collected from 2006 to 2013 on each bank's technology expenditures, broken into development cost and maintenance cost. These are the amount spent by

the sampled deposit money banks on acquisition of new systems and maintaining the existing ones, in line with the model specification.

3.2   Area of the Study

This study was carried out in Nigeria. Nigeria is located in the south western part of West Africa. The Country is sandwiched by Latitudes 5^0 $45^{'}$ and 8^0 $15^{'}$ North and Longitudes 4^0 $45^{'}$ and 6^0 $00^{''}$ East. It is bordered in the north-west by Republic of Benin, north by Niger, north-east by Chad and Cameroun, and Atlantic Ocean in the south. It has an estimated land area of about 15,000 sq. km. In the 2006 census of the National Population Commission (NPC), reported that the Country had a population of about 140 million people.   The administrative headquarters of the Country is Abuja and there are thirty-six States in Nigeria (Aworemi, 2006).

The study was focused on commercial banks (deposit money banks) in Nigeria which were 20 in numberwith 5,218 branches as at December, 2013.

3.3   Population of the Study

For the purpose of this study, the study population was twenty (20) deposit money banks(commercial banks) with a total of 5,218

branchesthat were in existence in 2013 as contained in the NDIC annual accounts and report, seeTable 3.1 for details. It is believed that the outcome of this study could be a reliable generalization for the banking industry in Nigeria.

Table3.1: Commercial Banks in Nigeria as at 31st December 2013.

S/N	Name of Banks	No of Branches	Banking License
1	Access Bank Plc	312	International
2	Citibank Nigeria Limited	12	National
3	Diamond Bank Plc	252	International
4	Ecobank Nigeria Plc	506	National
5	Enterprise Bank	152	International
6	Fidelity Bank Plc	196	International
7	First Bank of Nigeria Plc	622	International
8	First City Monument Bank Plc	257	International
9	Guaranty Trust Bank Plc	226	International
10	Key Stone Bank	200	National
11	MainStreet Bank	221	National
12	Skye Bank Plc	244	International
13	Stanbic-IBTC Bank Ltd.	180	National
14	Standard Chartered Bank Nig. Ltd.	39	National
15	Sterling Bank Plc	160	National
16	Union Bank of Nigeria Plc	338	International
17	United Bank For Africa Plc	602	International

18	Unity Bank Plc	238	National
19	Wema Bank Plc	125	Regional
20	Zenith Bank Plc	336	International
TOTAL		**5,218**	

Source: NDIC Annual Report and Statement of Account 2013

3.4   Sample size and sampling techniques

According to Asika (1991), sometimes, it is practically impossible to take a complete and comprehensive study of the entire population because of the nature and pattern of distribution of the elements in the population. Consequently, we sample because it is the only way to estimate the population characteristics in the circumstance. For the purpose of this research work, non-probability (purposeful) sample technique was used to select 13deposit money banks with 3,750 branches out of a total population of 20deposit money banks (commercial banks) with 5,218 branches that were operating in Nigeria as at December 31, 2013. Thus, the sample size is sixty-five percent (65%) in term of number of commercial banks, and seventy-two per cent (72%) in term of the entire population. This could be considered adequate for the purpose of drawing inferences with respect to the entire population under study.

A non-probability sampling method could be adopted in some circumstances where it was not feasible or practical to conduct random sampling. In the course of this research study, a non-probability sampling method in the form of purposive sampling techniques has been used. The use of availability sampling techniques was relied upon in order to solicit information that was available on the variables of interest in this study which were purposefully incorporated in the model. Detailed breakdown of some of the variables being studied such asICT development cost, ICT maintenance cost, earnings per share (EPS), return on assets (ROA), profit before tax (PBT), profit after tax (PAT) and total deposit(DEP) were not comprehensively provided by all the banks. As a result the researcher had to rely on banks where all necessary data could be sourced. The selected deposit money banks (commercial banks) with their branches are listed below in Table 3.2.

Table3.2: Selected Commercial Banks.

S/N	Name of Banks	No of Branches	Banking License
1	Access Bank Plc	312	International
2	Diamond Bank Plc	252	International
3	Fidelity Bank Plc	196	International
4	First Bank of Nigeria Plc	622	International
5	First City Monument Bank Plc	257	International
6	Guaranty Trust Bank Plc	226	International
7	Skye Bank Plc	244	International
8	Stanbic IBTC Bank Ltd.	180	National
9	Sterling Bank Plc	160	National
10	United Bank For Africa Plc	602	International
11	Unity Bank Plc	238	National
12	Wema Bank Plc	125	Regional
13	Zenith Bank Plc	336	International
		3,750	

Source: Field Survey 2014

3.5   Method of Data Collection

Secondary data were collected for the purpose of this study. Secondary data were extracted from annual accounts and reports of the selected commercial banks in Nigeria, CBN and NDIC

annual reports. Relevant data on banks expenditure on ICT development cost and ICT maintenance cost were extracted from commercial banks annual accounts and reports for the period of study which were regressed against earnings per share (EPS), return on asset

(ROA), Profit before Tax (PBT),Profit after Tax (PAT) and Deposit (DEP) as dependent variables to measure the impact of investments in ICT on the performance of deposit money banks. See Appendix 1 for more details.

3.6   Method of Data Analysis

The researcher used Ordinary Least Square with Multiple Regression Analysis with the aid of E-view 7.1 package to determine F-statistic test, t-statistics with associated probabilities to test the level of the variables. Also, Granger causality test was used to test the causal link between the dependent and independent variables. All these were usedto analyze the secondary data that were extracted from the annual accounts and reports of the sampled deposit money banks (commercial banks) used for study.

Decision Rule:

A null hypothesis isaccepted if the calculated P-(F-statistic) is greater than or equal to ($\geq$) the critical P-value and rejectedif calculated P-(F-statistic) is less than ($<$) critical P-value at 0.05 (5%) level of significant.

3.7　Model Specification

For the purpose of this study, a multiple regression model was employed to express banks performance as a function of investments in ICT or technology expenditure. ICT expenditure consists of ICT development cost and ICT maintenance cost. Performance is represented by earnings per share (EPS), return on asset (ROA), profit before tax (PBT), Profit after tax (PAT) and deposit (DEP). The model for the study is expressed as follows:

ICT $= f$(PER)

ICT$= f$(ICT Inv/ICTExp.)

ICT Inv/ICT Exp = ICTdvc + ICTmtc

EPS$= \alpha +$ICTdvc$_1 \beta_1 +$ ICTmtc$_2\beta_2 + \mathcal{E}_t$ i

ROA$= \alpha +$ICTdvc$_1 \beta_1 +$ICTmtc$_2\beta_2 + \mathcal{E}_t$ ii

PBT $= \alpha +$ ICTdvc$_1 \beta_1 +$ICTmtc$_2\beta_2 + \mathcal{E}_t$ iii

PAT$=\alpha+$ICTdvc$_1 \beta_1 +$ICTmtc$_2\beta_2 + \mathcal{E}_t$ iv

DEP$= \alpha +$ICTdvc$_1 \beta_1 +$ICTmtc$_2\beta_2 + \mathcal{E}_t$ v

Functional and Linear Equation

Econometric transformation of the model can be done by log-linearizing and adding error term in order to confirm whether the

relationship between the dependent and independent variables is linear. Also, it will enhance the fitness of the model for convenience and better interpretation of data. Log transforms are particularly appropriate if the variance increases with mean. Therefore, from the original model for this study as expressed in equation (i-v), an explicit estimable econometric model can be obtained as follows:

$$\text{Ln (EPS)} = \alpha + \beta_1 \text{Ln (ICT dvc}_1) + \beta_2 \text{Ln (ICT mtc}_2) + \mathcal{E}_t \text{ ----------- vi}$$

$$\text{Ln (ROA)} = \alpha + \beta_1 \text{Ln (ICT dvc}_1) + \beta_2 \text{Ln (ICT mtc}_2) + \mathcal{E}_t \text{ ----------- vii}$$

$$\text{Ln (PBT)} = \alpha + \beta_1 \text{Ln (ICT dvc}_1) + \beta_2 \text{Ln (ICT mtc}_2) + \mathcal{E}_t \text{ ----------- viii}$$

$$\text{Ln (PAT)} = \alpha + \beta_1 \text{Ln (ICT dvc}_1) + \beta_2 \text{Ln (ICT mtc}_2) + \mathcal{E}_t \text{ ----------- ix}$$

$$\text{Ln (DEP)} = \alpha + \beta_1 \text{Ln (ICT dvc}_1) + \beta_2 \text{Ln (ICT mtc}_2) + \mathcal{E}_t \text{ ----------- x}$$

Where:

Perf. = Bank Performance

ICT INV/ ICT Exp=ICT Investment Cost/ ICT expenses which comprises ICT Development cost (ICT dvc) and ICT Maintenance cost (ICT mtc)

Dvc=Development Cost on ICT by Banks

Mtc=Maintenance Cost on ICT by Banks

EPS = Earnings per Share

DEP = Deposit and current account

PAT = Profit after Tax

PBT = Profit before Tax

ROA = Return on Assets

EPS, DEP, PBT, PAT, DEP, and ROA are dependent variables used to measure banks performance.

Ln = Log of each performance variables used for the study

α = intercept term (Constant)

dvc and mtc represent independent variables for measuring banks performance

β = Standardized beta co-efficient of explanatory variables

ε_t = Error term

Where:**Perf.**stands for performance and is the dependent variable (i.e. deposit (**DEP**), return on equity**(ROE),** profit before tax (**PBT**), and profit after tax (**PAT**)); $\beta_1$andβ_2 are regression coefficients with unknown values to be estimated; **ICT Inv.** or **ICT Exp.** is the expenditure or investment inInformation and Communication Technology which is broken down into Development cost (**dvc**) and Maintenance cost (**mtc**) in Information Technology facilities; they are

the independent or explanatory variables. These are accounting numbers or data that are measured at the end of the year through the annual audited financial statements and are based on their book value.

The error term (ε_t) is used as a surrogate for other variables not included in the model. **ROA, DEP, EPS, PAT** and **PBT** are the parameters for measuring performance of banks within one fiscal year. These are perhaps some of the most important factors for measuring performance of any bank. Return on Assets (**ROA)** is a measure of a company's profitability, equal to a fiscal year earning divided by its total assets. It is expressed to measure how efficient the assets of a bank have been utilized. Deposit (**DEP**) is the total amount mobilized by banks which include current accounts balance.

A well performed bank stands the opportunity of attracting more customers which will positively affect the deposit liability. Profit before Tax (**PBT**) is the operation earnings/returns before tax is deducted; it represents the profit on the total funds employed by the banks. Profit after tax (PAT) is the residual profit after company income tax has been deducted. This represents the amount to be appropriated accordingly. An earnings per share (EPS) isthe amount of

profit attributable to a unit of the bank's share. It shows the profitability of the company on per share basis. It is a good yardstick for measuring the profitability of common shareholders' investment.The study period was from 2006 to 2013.

CHAPTER FOUR

PRESENTATION AND ANALYSIS OF DATA

4.1 Introduction

This chapter presentsthe analyses of data generated in response to the hypotheses. The analyses are presented sequentially using tables. A summary of the major findings of the study is equally presented in this chapter.

4.2   Data Presentation

Data used for this study are presented in this section in various forms to explain investments in information and communication technology (ICT) on performance of deposit money banks in Nigeria within the period of study (2006 – 2013).

Table 4.1:   Presentation of Original Value Data

Year	PBT (N'M)	PAT (N'M)	DEP (N'M)	ROA (N'M)	ICT DEV. (N'M)	ICT MAIN (N'M)	EPS (K)
2006	5451.615	5341.154	192510.1	2723.154	4808.846	23.07692	59.15385
2007	10753.31	7949.308	268318.7	4186.417	6875.692	60.84615	78.69231
2008	18052.54	15309.62	435373.8	5791.923	8114.538	83.07692	102.2308
2009	8648.154	6052.077	481167.3	5947.077	10156.31	61	24.69231
2010	16033.46	13455.62	514913	6419.769	11077.23	149.3846	65.61538
2011	9411.231	11692.15	631123.8	6523.077	10629.85	64.92308	39.69231
2012	34565.54	30809.31	856017	10277.54	12084.69	290.0769	103.5385
2013	31850.38	27591.54	1015573	13897.38	12208.54	85.92308	109.5385

Source: Compiled with E-View 7.1 Package by the author (2016)

Table 4.2:   Presentation of Data (Log Transformation)

Year	LOG PBT	LOG PAT	LOG DEP	LOG ROA	LOG ICT	LOG ICT MAIN	LOG EPS
2006	3.736525	3.727635	5.284454	3.435072	3.682041	1.363178	1.771983
2007	4.031542	3.900329	5.428651	3.621842	3.837316	1.784233	1.895932
2008	4.256538	4.184964	5.638862	3.762823	3.909264	1.91948	2.009582
2009	3.936923	3.781904	5.682296	3.774304	4.006736	1.78533	1.392562
2010	4.205027	4.128904	5.711734	3.807519	4.044431	2.174306	1.817006
2011	3.973646	4.067894	5.800115	3.814453	4.026527	1.812399	1.598706
2012	4.538643	4.488682	5.932482	4.011889	4.082236	2.462513	2.015102
2013	4.503115	4.440776	6.006711	4.142933	4.086664	1.93411	2.039567

Source: Computed with E-View 7.1 package by the author (2016)

Figure 4.1: Graphic Presentation of Data
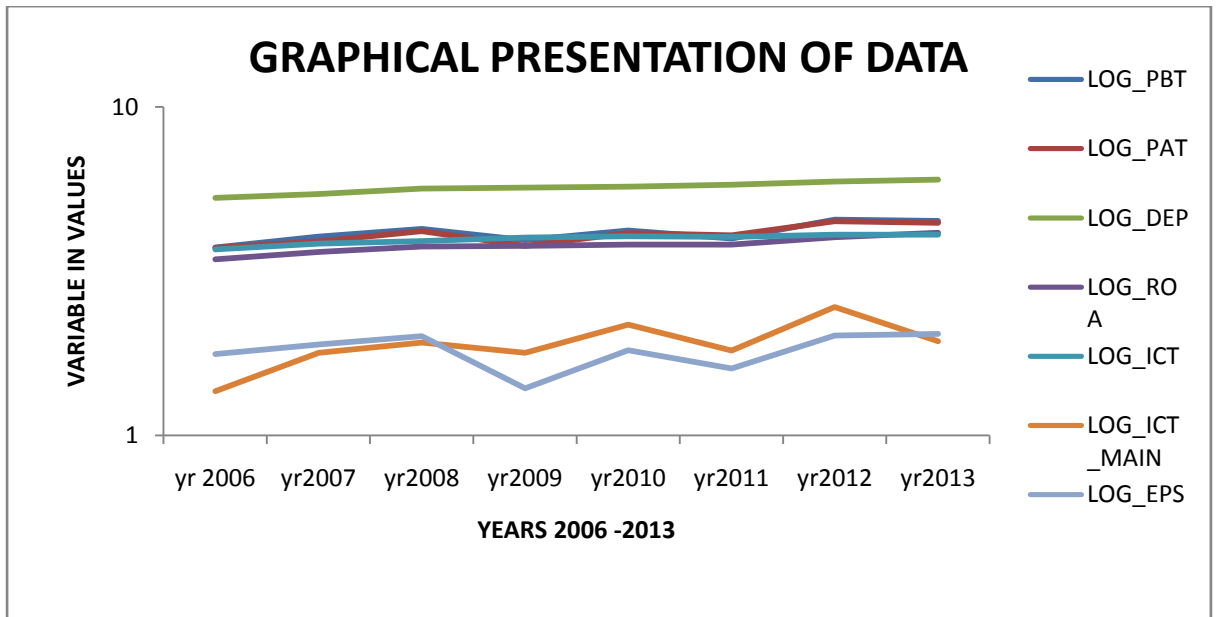
Source: Drawn with E-View 7.1 package by the author (2016)

Figure 4.2: Bar Chart Presentation of Data
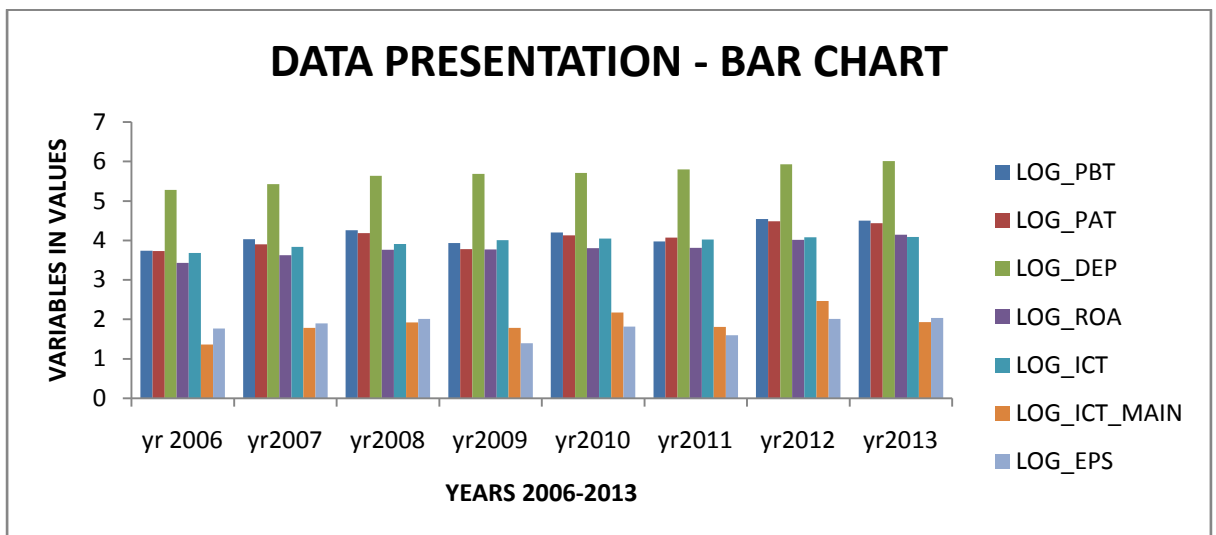
Source: Drawn with E-View 7.1 package by the author (2016)

Figure 4.3: Histogram Presentation of Data
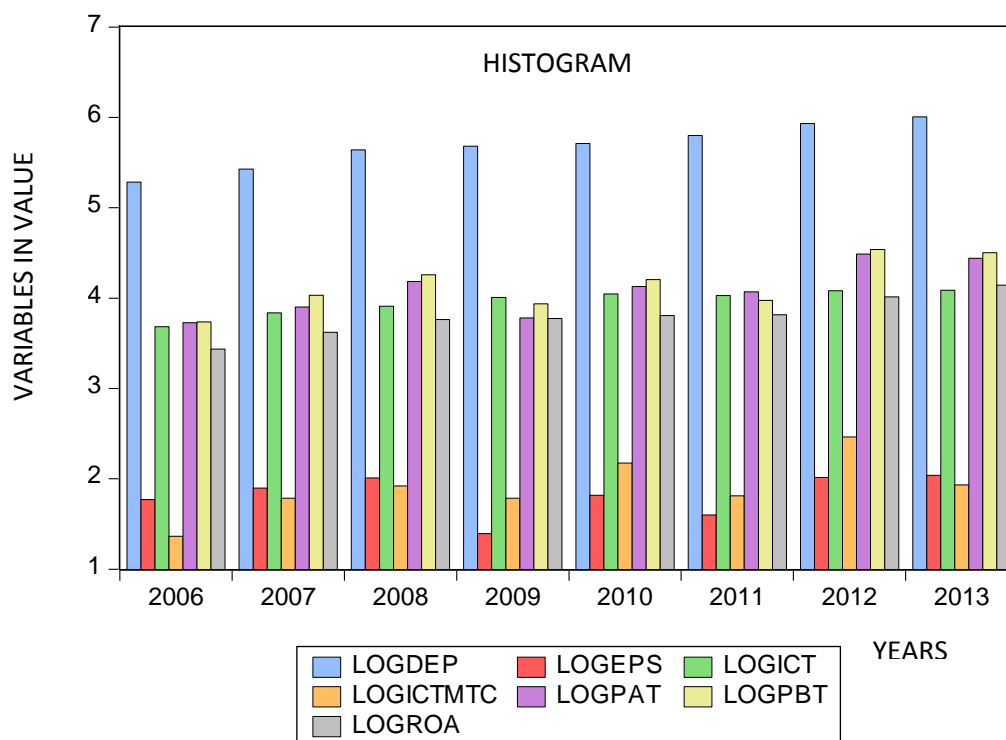
Source: Drawn with E-View 7.1 package by the author (2016)

4.3   Data Testing According to Hypotheses

Test of Hypothesis-1:
The impact of investments in ICT on earning per share (EPS) among the deposit money banks in Nigeria is not statistically significant.

Table 4.3: Ordinary Least Square Multiple Regression Test Dependent Variable: EPS

Dependent Variable: LOGEPS
Method: Least Squares
Date: 06/20/16   Time: 22:15
Sample: 2006 2013
Included observations: 8

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOGICTMTC	0.671876	0.413166	1.626164	0.1648
LOGICTDVC	-1.111558	0.935319	-1.188426	0.2880
C	4.939109	3.126579	1.579717	0.1750

R-squared	0.347525	Mean dependent var	1.817555
Adjusted R-squared	0.086535	S.D. dependent var	0.227383
S.E. of regression	0.217323	Akaike info criterion	0.065128
Sum squared resid	0.236145	Schwarz criterion	0.094919
Log likelihood	2.739487	Hannan-Quinn criter.	-0.135797
F-statistic	1.331564	Durbin-Watson stat	1.598448
Prob(F-statistic)	0.343882		

SOURCE: Computed with E-View 7.1 by the author (2016)

From Table 4.3the multiple regression model results show the following: Estimated model EPS = 4.939109 − 1.111558ICTdvc + 0.671876ICTmtc + ε_t.

F. statistics = 1.331564, R^2 = 0.347525, Adj. R^2 = 0.086535, R = 0.59, P-(F-statistic) = 0.343882.

From the above results, the coefficient of determination R^2 = 0.347525or 35% showed that ICT development cost and ICT maintenance cost variables jointly explained variation by 35% of deposit money banks performance proxied by earnings per share (EPS), while the remaining 65% variance is not explained by the independent variables, might be explained for by other factors outside

the model, like extraneous variables captured by the error term (ε_t). The adjusted R^2 of 0.086535 (9%) which showed a more conservative way of looking at the coefficient of determination; this confirmed that only9% change of EPS are explained by ICTdvc and ICTmtc. Since the adjusted $R^2$is less than 50%, this implies that the estimated model is not good fit and reliable to determine the relationship between the dependent variable and independent variables. With P-(F-statistic) of 0.343882 which is greater than 0.05 level of significance, null hypothesis (H_o) which states that the impact of investments in ICT on earning per share (EPS) among the deposit money banks in Nigeria is not statistically significant is accepted.

Test of Hypothesis-2:
The impact of investments in ICT on return on assets (ROA) of deposit moneybanks in Nigeria is not statistically significant.

To test the above hypothesis, Multiple Regression analysis was conducted

andthe results were extracted from E-view 7.1 package as shown in Table 4.4:

Table 4.4: Ordinary Least Square Multiple Regression Test Dependent Variable: ROA

Dependent Variable: LOGROA

Method: Least Squares
Date: 06/20/16   Time: 22:53
Sample: 2006 2013
Included observations: 8

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ICTMTC	0.018238	0.203785	0.089494	0.9322
LOGICTDVC	1.363677	0.461326	2.955994	0.0317
C	-1.637725	1.542118	-1.061997	0.3368

R-squared	0.825711	Mean dependent var		3.796354
Adjusted R-squared	0.755995	S.D. dependent var		0.216997
S.E. of regression	0.107190	Akaike info criterion		-1.348437
Sum squared resid	0.057448	Schwarz criterion		-1.318647
Log likelihood	8.393749	Hannan-Quinn criter.		-1.549363
F-statistic	11.84399	Durbin-Watson stat		0.854339
Prob(F-statistic)	0.012682			

SOURCE: Computed with E-View 7.1 by the author (2016)

From Table 4.4, the multiple regression model result shows the following:

Estimated model ROA = -1.637725 + 1.363677ICTdvc − 0.018238ICTmtc + $\mathcal{E}_t$

F-statistic = 11.84399, P-(F statistic) = 0.012682, R^2 = 0.825711, Adj.R^2= 0.755995, R = 0.90868.

From this result, the coefficient of determination R^2 = 0.825 or 83% showed that ICT surrogates jointly explained 83% variation in banks performance proxied by return on asset (ROA), while the remaining 17% variance not explained by the regression might be accounted for by other factors outside the model, that is, extraneous

variables captured by error term. Also,the adjusted R^2 of 0.825 or 83%

is a more conservative way of looking for coefficient of determination.

This indicates that 83% changes or variations in dependent variable

(ROA) is accounted for by independent variables (ICTdvc and

ICTmtc). Since adjusted R^2 is above 50%, it shows that the estimated

model is of good fit and reliable for policy making. With F-statistics of

11.84399 and P-(F-statistic) of 0.012682 which is less than 0.05 level

of significance, the null hypothesis (H_o) which states thatthe impact of

investments in ICT on return on assets (ROA) of deposit money banks

in Nigeria is not statistically significant is rejected, while the alternate

hypothesis (H_1)is accepted; that is, the impact of investments in ICT on

returns on assets (ROA) of deposit money banks in Nigeria is

statistically significant.

Test of Hypothesis-3:
***There is no statistical significant impact of investments in ICT on
profit before tax (PBT) of deposit money banks in Nigeria.***

To test the above hypothesis, Multiple Regression analysis was

conducted and the results were extracted from E-view 7.1 package as

shown in Table 4.5:

**Table 4.5: Ordinary Least Square Multiple Regression Test
Dependent Variable: PBT**

Dependent Variable: LOGPBT
Method: Least Squares
Date: 06/21/16   Time: 12:56
Sample: 2006 2013
Included observations: 8

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ICTMTC	0.615387	0.342701	1.795695	0.1325
LOGICTDVC	0.336114	0.775802	0.433248	0.6829
C	1.644963	2.593346	0.634301	0.5538

R-squared	0.705447	Mean dependent var		4.147745
Adjusted R-squared	0.587626	S.D. dependent var		0.280705
S.E. of regression	0.180259	Akaike info criterion		-0.308853
Sum squared resid	0.162466	Schwarz criterion		-0.279062
Log likelihood	4.235411	Hannan-Quinn criter.		-0.509778
F-statistic	5.987447	Durbin-Watson stat		1.179135
Prob(F-statistic)	0.047088			

SOURCE: Computed with E-View 7.1 by the author (2016)

Table 4.5 showed the multiple regression model results where:

$PBT = 1.644963 + 0.336114 ICTdvc + 0.615387 ICTmtc + \varepsilon_t$. F-statistic = 5.987447, P-(F- statistic)= 0.047088, R^2 = 0.705447, Adj. R^2 = 0.587626, R = 0.8399.

From this result, the coefficient of determination R^2 of 0.705447 or 71% shows that 71% of variation or changes in profit before tax (PBT) is explained by ICT surrogates (ICTdvc and ICTmtc), while the remaining 29% variance not explained by the independent variables might be accounted for as a result of the impact of other factors outside the model otherwise known as extraneous variables. Furthermore, the Adj.R^2 of 0.5876 or 59% shows a more conservative way of looking at

coefficient of determination which indicates that the estimated model is of good fit and reliable to determine the impact of investments in ICT on profit before tax (PBT) of deposit money banks in Nigeria. The results also showed F-statistic of 4.568635 and P-(F-statistic) of 0.047088 which is less than 0.05 level of significance; hence the alternate hypothesis (H_1) which states that the impact of investments in ICT on profit before tax (PBT) is statistically significant is accepted; while the null hypothesis (H_o)is rejected.

Test of Hypothesis-4:

There is no statistical significant impact of investments in ICT on profit after tax (PAT) among the deposit money banks in Nigeria.

**Table 4.6: Ordinary Least Square Multiple Regression Test
Dependent Variable: PAT**

Dependent Variable: LOGPAT
Method: Least Squares
Date: 06/20/16   Time: 22:18
Sample: 2006 2013
Included observations: 8

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOGICTMTC	0.536246	0.370457	1.447527	0.2074
LOGICTDVC	0.480138	0.838635	0.572523	0.5917
C	1.167825	2.803383	0.416577	0.6943
R-squared	0.658066	Mean dependent var		4.090136
Adjusted R-squared	0.521293	S.D. dependent var		0.281632
S.E. of regression	0.194858	Akaike info criterion		-0.153097
Sum squared resid	0.189848	Schwarz criterion		-0.123306
Log likelihood	3.612388	Hannan-Quinn criter.		-0.354022
F-statistic	4.811356	Durbin-Watson stat		1.483784
Prob(F-statistic)	0.068368			

SOURCE: Computed with E-View 7.1 by the author (2016)

To test the above hypothesis, Multiple Regression analysis was conducted and the results were extracted from the E-view 7.1 package as shown in Table 4.6:

From Table 4.6,multiple regression results show the following:

$$PAT = 1.67825 + 0.480138ICTdvc + 0.536246ICTmtc + \varepsilon_t.$$

F-statistic = 4.811356, P-(F-statistic) = 0.068368, R^2 = 0.658066, Adj.R^2 = 0.521293, R = 0.8112.

From the result, the coefficient of determination R^2 of 0.658066 or 66% indicates that 66% changes or variations of dependent variable (PAT) is explained by independent variables (ICT investment surrogates) while the remaining 34% variance not explained by the

independent variables could be accounted for by the impact of other factors outside the model, which can be attributed to extraneous variables. Also, a more conservative way of looking at the coefficient of determination Adj.R^2 = 0.521 (52%); which is above 50%, implies that the estimated model for the study is of good fit and reliable for the determination of relationship between PAT and ICT investments surrogates.

With F-statistic of 4.811356 and P-(F-statistic) of 0.068368 which is greater than 0.05 (P > 0.05) level of significance, the null hypothesis (H_o) which states that there is no statistical significant impact of investments in ICT on profit after tax (PAT) among the deposit money banks in Nigeria is hereby accepted; while the alternate hypothesis (H_1) is rejected.

Test of Hypothesis-5:
The impact of investments in ICT on total deposit mobilized (DEP) by deposit money banks in Nigeria is not statistically significant.

To test the above hypothesis, Multiple Regression analysis was carried out and results were extracted from E-view 7.1 package for proper interpretation as shown in Table 4.7.

Table 4.7: Ordinary Least Square Multiple Regression Test
Dependent Variable: DEP

Dependent Variable: LOGDEP
Method: Least Squares
Date: 06/20/16   Time: 22:23
Sample: 2006 2013
Included observations: 8

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOGICTMTC	-0.032521	0.172395	-0.188643	0.8578
LOGICTDVC	1.675892	0.390265	4.294236	0.0078
C	-0.887932	1.304577	-0.680629	0.5263
R-squared	0.898984	Mean dependent var		5.685663
Adjusted R-squared	0.858578	S.D. dependent var		0.241127
S.E. of regression	0.090679	Akaike info criterion		-1.682994
Sum squared resid	0.041113	Schwarz criterion		-1.653203
Log likelihood	9.731975	Hannan-Quinn criter.		-1.883919
F-statistic	22.24857	Durbin-Watson stat		1.280664
Prob(F-statistic)	0.003243			

SOURCE: Computed with E-View 7.1 by the author (2016)

Table 4.7 showed the multiple regression result as follows:

$$DEP = -0.887932 + 1.675892 ICTdvc - 0.032521 ICTmtc + \varepsilon_{t.;}$$

$$R^2 = 0.898984,\ Adj.R^2 = 0.858578,\ R = 0.86,\ F\text{-statistic} = 22.24857,$$

P-(F- statistic)= 0.003243.

From the result, the coefficient of determination R^2 of 0.898 or

90% implies that 90% of variation or changes in dependent variable

(DEP) is explained by independent variables (ICTdvc and ICTmtc)

while the remaining 10% variance is not explained by the independent

variables could be accounted for by the impact of other factors outside

this model (i.e. extraneous variables). Also, the Adjusted R^2 of 0.858

or 86% is more than 50% which indicates that the estimated model for this study is of good fit and reliable for the determination of the impact of ICT investment on deposit mobilized by commercial banks in Nigeria. With F-statistic of 22.24857 and P-(F-statistic) of 0.003243 which is less than 0.05 level of significance, the null hypothesis (H_o) which states that the impact of investments in ICT on total deposit mobilized (DEP) by deposit money banks in Nigeria is not statistically significant is rejected and the alternate hypothesis (H_1) is accepted, that is, the impact of investments in ICT on total deposit mobilized (DEP) by deposit money banks in Nigeria is statistically significant.

Test of Hypothesis.6:

That causality link between investments in ICT and banks' performance proxy variables of deposit money banks in Nigeria is not statistically significant.

Since the multiple regression analysis does not suggest causal association or relationship, the Granger Causality test is employed to determine the causal link between the dependent variables (EPS, ROA, PBT, PAT and DEP) i.e. banks performance variables and independent variables (ICTdvc and ICTmtc) on deposit money banks in Nigeria. Therefore, analyses are shown in the Table 4.8.

Table 4.8: Pairwise Granger Causality Tests between the Dependent and Independent Variables:

Pairwise Granger Causality Tests
Date: 06/21/16   Time: 13:04
Sample: 2006 2013
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
ICTMTC does not Granger Cause LOGEPS	6	0.04696	0.9561
LOGEPS does not Granger Cause ICTMTC		0.07130	0.9355
LOGICTDVC does not Granger Cause LOGEPS	6	0.02628	0.9747
LOGEPS does not Granger Cause LOGICTDVC		368.168	0.0368
LOGDEP does not Granger Cause LOGEPS	6	0.02122	0.9794
LOGEPS does not Granger Cause LOGDEP		0.40086	0.7450
LOGPAT does not Granger Cause LOGEPS	6	0.49660	0.7083
LOGEPS does not Granger Cause LOGPAT		0.30243	0.7894
LOGPBT does not Granger Cause LOGEPS	6	0.14832	0.8782
LOGEPS does not Granger Cause LOGPBT		0.04253	0.9600
LOGROA does not Granger Cause LOGEPS	6	0.68416	0.6498
LOGEPS does not Granger Cause LOGROA		0.06396	0.9416
LOGICTDVC does not Granger Cause ICTMTC	6	0.08589	0.9238
ICTMTC does not Granger Cause LOGICTDVC		11.2304	0.2065
LOGDEP does not Granger Cause ICTMTC	6	1.20137	0.5421
ICTMTC does not Granger Cause LOGDEP		0.07857	0.9296
LOGPAT does not Granger Cause ICTMTC	6	0.11941	0.8985
ICTMTC does not Granger Cause LOGPAT		0.01084	0.9893
LOGPBT does not Granger Cause ICTMTC	6	0.12947	0.8912
ICTMTC does not Granger Cause LOGPBT		0.07570	0.9319
LOGROA does not Granger Cause ICTMTC	6	0.15858	0.8713
ICTMTC does not Granger Cause LOGROA		0.15172	0.8759
LOGDEP does not Granger Cause LOGICTDVC	6	0.74743	0.6331
LOGICTDVC does not Granger Cause LOGDEP		0.11487	0.9018
LOGPAT does not Granger Cause LOGICTDVC	6	9.05271	0.2288
LOGICTDVC does not Granger Cause LOGPAT		0.02944	0.9718
LOGPBT does not Granger Cause LOGICTDVC	6	3.07831	0.3738
LOGICTDVC does not Granger Cause LOGPBT		0.05485	0.9493
LOGROA does not Granger Cause LOGICTDVC	6	4.37970	0.3201
LOGICTDVC does not Granger Cause LOGROA		0.12490	0.8945

LOGPAT does not Granger Cause LOGDEP	6	0.06997	0.9366
LOGDEP does not Granger Cause LOGPAT		0.14427	0.8809
LOGPBT does not Granger Cause LOGDEP	6	71.6104	0.0833
LOGDEP does not Granger Cause LOGPBT		1.28855	0.5287
LOGROA does not Granger Cause LOGDEP	6	7.81457	0.2452
LOGDEP does not Granger Cause LOGROA		14.0777	0.1852
LOGPBT does not Granger Cause LOGPAT	6	1.63368	0.4841
LOGPAT does not Granger Cause LOGPBT		27.3489	0.1340
LOGROA does not Granger Cause LOGPAT	6	0.02266	0.9781
LOGPAT does not Granger Cause LOGROA		0.11008	0.9053
LOGROA does not Granger Cause LOGPBT	6	5.35013	0.2923
LOGPBT does not Granger Cause LOGROA		1.13654	0.5527

SOURCE: Computed with E-View 7.1 by the author (2016)

The results from Table 4.8 revealed that P-(F-statistics) are greater than $0.05 (P > 0.05)$ between the variables hence, the null hypotheses (H_o) are accepted except between EPS and ICTdvc where the P-(F-statistic) = 0.0368 which is less than 0.05 ($P < 0.05$). With the P-(F-statistic) of 0.0368, null hypothesis (Ho) is rejected; while the alternate (H_1) is accepted hence, ICTdvc granger causes EPS.

4.4   Discussion of Findings

The outcome of the analysis from Table 4.3indicates that the model is not good fit and not statistically significant at 0.05 level of significance. Further analysis revealed that the coefficient of relationship 'R' = 0.59 (59%) which indicated that there is a strong relationship between the dependent variable (EPS) and the independent

variables (ICTdvc and ICTmtc); an indication that investments in ICT has the tendency of contributing/impacting strongly on EPS of deposit money banks in Nigeria. In addition, the estimated constant (α) of 4.939109 − 1.111558ICTdvc + 0.671876ICTmtc indicates that if the value of independent variables is zero, the dependent variable (EPS) is 4.939109 times. The coefficient of ICT development is -1.111558 which shows that there is negative relationship with EPS; while on the contrary, ICT maintenance with coefficient 0.67187 showed a positive relationship with EPS but not statistically significant at 0.05 level of significance.

The outcome indicates that amount spent by banks on ICT development will negatively impacted on EPS while ICT maintenance has the tendency of improving it through enhanced confidence of the banking public.

The outcome of analysis from Table 4.4 with R^2 = 0.825711, Adj.R^2 of 0.755995 with P-(F-statistic) of 0.012682 indicates that the model is of good fit and reliable for the study and statistically significant at 0.05 level of significance. With coefficient 'R' of 0.86947 or 87% shows a strong relationship between the dependent

variable (ROA) and independent variable i.e. ICT investments (ICT development and maintenance costs). With ROA constant (α) = -1.637725 + 1.363677ICTdvc + 0.018238ICTmtc indicates that if the value of independent variables is zero, the dependent variable (ROA) is -1.637725 times negatively affected and it is statistically significant at 0.05 level of significance. In addition, both ICT development cost and ICT maintenance cost have positive relationship with ROA as shown in their coefficient (1.363677ICTdvc + 0.018238ICTmtc). While ICTdvc with P-(F-statistic) of 0.0317 (P < 0.05) is statistically significant at 0.05 level of significance; ICTmtc with P-(F-statistic) of 0.9322 (P > 0.05) is not statistically significant at 0.05 level of significance. This indicates that amount spent on ICT development and ICT maintenance by deposit money banks in Nigeria impacted significantly on ROA; but statistically significant on ICT development. ICT development cost deals with acquisition of more assets with the tendency of increasing the assets value in the balance sheet viz-a-viz returns on assets, while ICT maintenance cost makes the assets (ICT) life to be prolonged and efficient, but increases the overhead cost and reduces the operating profit.

Findings from Table 4.5revealed that R^2 = 0.705447 (71%), Adj.R^2 = 0.587626 (59%), and P-(F-statistic) of 0.047088 (P < 0.05) an indication that the model is of good fit for the study and statistically significant at 0.05 level of significance. The correlation coefficient 'R' of 0.83991 (84%) indicates a strong relationship between the dependent variable (PBT) and independent variables (ICT investments). PBT (α) = 1.644963 + 0.336114ICTdvc + 0.615387ICTmtc indicates that if the value of independent variables is zero, the dependent variable (PBT) is 1.644963 times, but not statistically significant; the coefficient of ICT development and maintenance costs are positive, but not statistically significant at 0.05 level of significance since their P-(F-statistic) are greater than 0.05.

What we can infer from the above is that investments in ICT has positive impact and strong relationship on deposit money banks performance proxied by profit before tax (PBT) and it is statistically significant at 0.05 level of significance. The more a bank invests in ICT development and maintenance, the more likelihood such bank increases its gross earning. It should be noted that banks with robust ICT will have competitive edge over otherbanks,this is in line with

Agboola (2005), who discovered that technology has been the main driving force of competition in the banking industry.

Findings from Table 4.6 which centred on PAT showes that R^2 = 0.658066 (66%), Adj.R^2 = 0.521293 (52%), and P-(F-statistic) of 0.068368 (P > 0.05) an indication that the model is of good fit for the study, but not statistically significant at 0.05 level of significance. The correlation coefficient 'R' of 0.8112 (81%) indicates a strong relationship between the dependent variable (PAT) and independent variables (ICT investments). PAT (α) = 1.167825 + 0.480138ICTdvc + 0.536246ICTmtc indicates that if the value of independent variables is zero, the dependent variable (PAT) is 1.167825 times but not statistically significant; the coefficient of ICT development and maintenance costs are both positive, but not statistically significant at 0.05 level of significance their P-(F-statistic) are greater than 0.05.

Though company income tax is an expense which reduces the gross profit of banks as corporate citizen/entity, but investments in ICT development attract capital allowance from tax authority, which serves as additional earning after company income tax has been deducted, thereby improve the amount due for appropriation. The more a bank

invest in ICT development, the more capital allowance it stands to gain which could impact positively on its performance. In addition, money spent on ICT maintenance would equally aid efficiency and improve performance.

From Table 4.7, R^2 = 0.898984 (90%), Adj.R^2 = 0.858578 (86%) with P-(F-statistic) of 0.003243. This indicted that the model is of good fit for the study and statistically significant at 0.05 level of significance because P-(F-statistic) of 0.003243 is less than 0.05 ($P < 0.05$). In addition, correlation coefficient 'R' of 0.9481 (95%) indicates a strong relationship between the dependent variable (DEP) and independent variables (investments in ICT) and it is statistically significant at 0.05 level of significance. DEP (α) = -0.887932 + 1.675892ICTdvc − 0.0325321ICTmtc; indicates that if the value of independent variables is zero, the dependent variable (DEP) is negatively affected by - 0.887932 times but not statistically significant; the coefficient of ICT development cost is 1.675892 and is statistically significant; while ICT maintenance cost has a negative impact of 0.0325321, but not statistically significant at 0.05 level of significance.The interpretation of the above is that more investments in ICT could lead to increase in

deposit mobilization by deposit money banks. A zero investment in ICT could cause a negative trend in deposit mobilization; while more investments in ICT development through the introduction of new ICT related products and services could positively impacted on deposit mobilization.

With respect to Granger Causality test carried out in Table 4.8, it was discovered that ICT development cost (ICTdvc) with P-(F-statistic) of 0.0368 which is less than 0.05 level of significance Granger-causes EPS; none of the other variables Granger-causes the other. It could be inferred that other factors apart from investments in ICT could be responsible for the performance of deposit money banks in Nigeria despite the strong relationship that existed between the performance variables and ICT investments variables.

In summary, the outcome of the analysis shows that there aresignificant impactsof investments in ICT on deposit money banks performance in Nigeria. The result is consistent with the findings of Dauda and Akingbade (2011) that discovered that technological innovation influenced banks employee's performance, customer's satisfaction and improvement in banks profitability.

In the same way, finding from this study also agreed with the findings of Abubakar, Nasir, and Haruna (2013), whichassessed the Impact of Information and Communication Technology on the Nigerian banking industry using eleven selected Commercial Banks in Nigeria. The study used bank annual data over the period 2001 to 2011.The findings of the study indicated that the use of ICT in the banking industry in Nigeria increases banks' performance.

On the adoption and utilization of ICT equipment, which was discovered to have impacted positively on banks profitability and deposit mobilization, this study agreed with Agboola (2006), and Salawu and Salawu (2007) who discovered that ICT investments surrogates have positive impact on deposit mobilization of deposit money banks in Nigeria during the period of study. The earlier studies found that technology has been discovered to be the main driving force of competition in thebanking industry during the period of study.

The outcome of this study revealed the nature of relationship that exists between investments in ICT and deposit money banks performance. The data analysis showed that a positive correlation exists between investments in ICT andperformance of deposit

moneybanks in Nigeria. This implies that a marginal change in the level of investments in ICT and its adoption could result to a proportionate increase in the performance level. These findings were in line with Obasan (2011) notwithstanding the fact that the earlier study made use of primary data.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1   Summary of Findings

This study investigated and examined investments inICT andperformance of deposit money banks in Nigeria. It groupedICT investments into ICT development cost and ICT maintenance cost; which represented the total sum of ICT investments or the total expenditure banks incurred in financing their ICT equipment.

The study made use of secondary data collected from various audited financial statements of the sampled deposit money (commercial) banks in Nigeria. The study employed purposeful sampling technique to select thirteen (13) out of the twenty (20) deposit money banks that were in operation as at 2013. The sampled banks were those that met the criterion set by the researcher. The studycovered a period of eight years (2006-2013) while multiple regression analysis and Granger Causality tests werecarried out on the data collected with E-view 7.1 statistical package to the determine the impact and relationship that existed between the dependent variables

(performance indices - EPS, ROA, PBT, PAT and DEP) and independent variables (ICT investments - ICT development cost and ICT maintenance cost).

The result of the regression analyses for the determination of the impact investments in ICT on deposit money banks' performance was measured by EPS covering the period 2006-2013. The result of the correlation coefficient showed that there is a strong relationship between EPS and ICT investments though not statistically significant at 0.05 level of significance; an indication that EPS as a performance index may improve as ICT investments is improved upon.

Looking at the impact of ICT investments on deposit money banks' performance measured in terms of returns on assets (ROA) within the period under study; linear regression results showed thatthere is a strong relationship between ROA and investments in ICT of deposit money banks within the period of study and this is statistically significant at 0.05 level of significance since P < 0.05. In addition, ICT development cost has positive impact and it is statistically significant on the ROA of deposit money banks in Nigeria. From the outcome, it can therefore be concluded that investments in

ICT contribute to ROA of deposit money bans in Nigeria, more especially, as more fund is being commuted on ICT development, the value of assets will increase and this has the tendency to improve on the return of assets. In the same way, investments on ICT maintenance will equally improve the assets (ICT) and make it more productive.

Profit before tax (PBT) as a performance index against investments in ICT of deposit money banks as shown in the Multiple Regression Analysis indicated that there is a strong relationship between the dependent variable (PBT), and independent variables (investments in ICT) and it is statistically significant at 0.05 level of significance. In addition, there is positive coefficient between the variables used for the study; an indication that more investments in ICT will lead to increase in profit before tax of deposit money banks in Nigeria. Though Granger Causality test conducted showed that neither ICT variables nor PBT causes each other, which means that investments in ICT is not the only factors that caused increase in profit of deposit money banks.

The result of the multiple linear regression analysis to determine the impact of investments in ICT on profit after tax (PAT) as

performance index of the deposit money banks in Nigeria showed that there is a strong relationship between PAT as a performance index on investments in ICT of deposit money banks in Nigeria. However, the impact is positive, but not statistically significant at 0.05 level of significance. Also, the Granger Causality test showed that there is no causal link between ICT investment proxies and banks performance proxied by PAT. It can therefore be concluded PAT does not granger cause investments in ICT; neither does ICT granger causes PAT since it was earlier stated that investments in ICT is not the only factors responsible for deposit money banks' performance in Nigeria, but the positive coefficient between the dependent and independent variables confirms the relevance of ICT in the profitability of banks.

The outcome of the Multiple Regression analysis carried out on deposit (DEP) as a performance index against ICT development cost and ICT maintenance cost showed that there is a strong relationship between investments in ICT and total deposit mobilized by banks. It further revealed that ICT development has greater influence on deposit mobilization of deposit money banks in Nigeria within the period under study. The result of Granger Causality test showed that neither

of the two variables (deposit and investments in ICT) causes the other, which means that other factors other than investments in ICT causes increase in deposit mobilized by deposit money banks in Nigeria

Finally, the outcome of the study showed that there are strong correlation among the performance variables used in this study (EPS, ROA, PBT, PAT and DEP) against the independent variables (ICT development cost and ICT maintenance cost). An indication that investments in ICT have great impact on the performance of deposit money banks within the period under study. As regard being statistically significant at 0.05 level of significance, both EPS and PAT were not statistically significant; other performance variables (ROA, PBT and DEP) were statistically significant. It can therefore be concluded that there is positive and significant impact of investments in ICT on the performance of deposit money banks in Nigeria; while the result of Granger Causality test revealed that investments in ICT did not cause performance variables of deposit money banks, other extraneous variables not captured by the model represented by error term (ε_t) could be responsible for performance of deposit money banks in Nigeria.

5.2   Implications of Findings

From the empirical study we can infer that investments in ICT or ICT proxy variables (i.e. ICT development cost and ICT maintenance cost) have positive and strong relationship on deposit money banks performance proxied by earnings per share (EPS), return on asset (ROA), profit before tax (PBT), profit after tax (PAT) and total deposit (DEP), but earnings per share (EPS) and profit after tax (PAT) are not statistically significant at 0.05 level of significance because their P-(F-statistic) are greater than 0.05 ($P > 0.05$).All other factors remaining constant, a marginal increase in investments inICT (ICT development cost and ICT maintenance cost) will lead to increase in earnings per share (EPS), return on assets (ROA), profit before tax (PBT), profit after tax (PAT), and total deposit (DEP). These are indicators that deposit money banks stand the chance of attracting new customers and retain the existing ones as a result of additional investment or expenditure in ICT facilities. The banks equally stand the chance of witnessing increase on thereturns on assets, since the value of ICT development will add to the existing value of assets. In addition, availability of various ICT facilities could lead to increase in deposits

mobilization as more ICT related products/services would attract more customers.In addition, capital allowance on ICT development could improve deposit money banks' profit after tax (PAT) and possibly earnings per share (EPS).

In view of the fact that ICT maintenance cost was not statistically significant at 0.05 level of significance when compared with the performance variables (EPS, ROA, PBT, PAT, and DEP) revealed that amount spent on ICT maintenance by deposit money banks over the period of study was not good enough (inadequate) to impact significantly on performance proxies. This is practically reflected on the malfunctions of many ICT facilities, more especially automated teller machine (ATM); the resultant effect makes majority of deposit money banks ATM access points congested. The more banks spend on ICT maintenance, all things being equal, the better it will impact on performance and enhance quality and efficient service delivery and customer satisfaction.

Realising that neither the dependent variables nor the independent variables granger causes the other except ICT development and EPS, shows that other factors other than investments

in ICT played significant role in deposit money banks performance in Nigeria within the period under study; hence the need for regulatory authority(CBN) to ensure that deposit money banks improve on their ICT investments, while more awareness should be embarked upon to educate the banking public.

Finally, the need for deposit money banks to improve their investments in ICT (development and ICT maintenance) and sensitize the banking public to embrace ICT related services/products would go a long way towards revolutionized the Nigerian banking industry in line with international best practice.

5.3   Conclusion

Information and Communication Technology (ICT) is one of the main forcesdriving the present day business environment. Today, ICT is dramaticallyinforming business practices as well as the outcome of businessengagements. This influence is most manifest in the banking sector given therole that banks play in individual and national economic lives. Consequently,the issues of how and why ICT is transmitted and put to use in banks haveattracted the attention of information and management researchers in recenttimes.

In line with this trend, this research focused on investments in ICT onperformance of deposit money banks in Nigeria. It delves into ICT development cost and ICT maintenance cost on some performance variables – EPS, ROA, PBT, PAT and DEP. The research assessed relevant data from thirteen deposit money banks (commercial banks) in Nigeria within the periods of study (2006 – 2013). Data collected were analyzed with E- View 7.1 version statistical package to determine the impact of the independent variables on each of the dependent variable; while Pairwise Granger Causality test was carried out to determine the relationship among the variables.

The study concludes that ICT development should be embraced because of its impact on the performance variables. ICT equally has the potentials of enhancing value-added services to the public and put Nigerian banks in proper position to face global challenges. Deposit money banks need to increase the tempo on ICT maintenance to enhance efficient services delivery which would impact positively on ICT usage and profitability. Banks' investments in ICT will enhance performance, effective and efficient service creation and delivery and

allow Nigerian banks to compete favourably globally in this era of electronic banking (e-banking).

5.4   Recommendations

From the empirical findings of the study, the following recommendations were put forward:

In line with the findings and towards further improving the state of the Nigeria banking industry, it is imperative that deposit money banksshould raise the level of investment and integration in ICTinto their operations beyond the basic level of interaction. The study recommends effective management of technological innovation for improved employees performance, customers' satisfaction, sustainable profit, increased return on investment, returns on equity, and to promote competitiveness in the Nigerian banking industry.

Efforts must bemade to improve on ICT maintenance in order to improve efficient service delivery which will enhance public confidence and increase in ICT based services/products. This ispossible given the improved state of ICT infrastructure that is now availablein the country and higher clientele awareness about ICT. As Agboola (2006)puts it, 'increased investment in ICT should form an

important component ofthe overall strategy of banking operators to ensure effective performance'.

Given the outcome of Granger Causality test that revealed that neither variable granger-causes the other, or that each of the two variables granger-causes the other, the need for public enlightenment on ICT services/products, their usages and associated merits will go a long way in enhancing more clientele from the publicto embrace ICT and allow banks to be judged/rated and patronized based on ICT innovations and efficiency.

In addition, as ICT applications become more universally available in the banking industry, they lose their appeal as a competition tool for attracting andretaining customers if the gadgets are not functioning well. This has the implication that those banks that willgarner competitive advantage must take the additional step of furthercustomizing their ICT applications thereby increasing their ICT expenditure and not only to make them unique and moreappealing to customers but also to make them more easily accessible andoperationally more effective than those of their competitors.

Conclusively, apart from purchase of latest equipmentdesigned and manufactured in the advanced countries of Europe, America, Japan and China, human resource should be well managed and motivated for better productivity (Dauda, 2010).

5.5 Contribution to Knowledge

This study investigated and determines the impact of investments inICT proxy variables (ICT development cost and ICT maintenance cost) on performance of deposit money banks in Nigeria post-consolidated era (2006 – 2013). The uniqueness of this study is that:

1. The study revealed that ICT as a mechanism cannot be explained without a theory; rather it is the theory that can assist in explaining the concept of acceptance of ICT in an organizational system. The study adopted Diffusion of Innovation (DOI) Theory by Rogers (2003), Technology Acceptance Model (TAM) by Bagozzi, Davis and Warshaw (1989) and Technology, Organization and Environment (TOE) Framework by Tornatzky and Feischer (1990) because of their relevance to the study, more especially, the aforementioned theories in the area of investments in ICT. In addition, the study employed

relevant ICT variables (development cost and maintenance cost) as independent variables which was regressed against some performance variables (earning per share, return on assets, profit before tax, profit after tax and total deposit) to determine the impact and the level of relationship between the dependent and independent variables.

2. The study has developedcommercial banks' performance models which are proxied by earnings per share, profit before tax, profit after tax, return on asset,and deposit, in order to establish the validity of the estimated model through F-statistic, t-statistic with associated probabilities to test the level of the variables; while Granger Causality test was carried out to determine the relationship between the dependent variables and the independent variables.

3. The additional uniqueness of this study, to the best of theresearcher's knowledge, is that it is one of the few research worksin recent time, that attempts to synthesize andintegrate the increasing empirical research output on investments in ICT (ICT development cost and ICT maintenance cost)onperformance of deposit money banks in Nigeria, post-consolidation era (2006 − 2013). It used secondary data that cut across all the categories of commercial banks in the

country; sampled used was robust enough (65% in term of banks numbers and 72% in term of branches); most prior researches of this type, whereavailable at all, had tended to be intuitive in nature relying on theoreticalrather than empirical facts with samples not representative enough.

4.Furthermore, this study provides a broadoutlook on the issue of investments in ICT performance of deposit money banks in post-consolidation era. It should be born in mind that with banks consolidation of 2005 and the CBN intervention of 2009, Nigeria banking models, more importantly deposit money banks (commercial banking), had changed significantly and this study updated knowledge on the subject matter.

5.6   Suggestions for Further Study

The following suggestions are made for further studies:

i.   Path Investigation of ICT Impact on Deposit Money Banks' Share-value.
ii. Co-movement between ICT investment and Deposit Money Banks' Profitability.
iii. ICT maintenance cost and service delivery by deposit moneybanks in Nigeria.

REFERENCES

Abubakar, M., Nasir, M. G., &Haruna S. B. K. (2013).Impact of information and communication technology on bank performance: A study of selected commercial banks in Nigeria (2001 – 2011). *European Scientific Journal.9*(7), 1857 – 1881

Abubakar, A. &Rosmaini, B.T. (2012). The impact of information and Communicationtechnology on bank's performance and customer service delivery in the banking industry.*International Journal Latest Trends in Finance Economic and Science2*(1) March, 44-52

Adam, (1998). Financial intermediation and economic growth: Evidence from Nigeria, *Journalof Economic Management*, *5(2)*, 25-48.

Adegbite, S.A. (2010). A study of technological innovations in the IndigenousTextileweavingindustry in South-Western Nigeria. *UnpublishedPh.D Thesis*ObafemiAwolowo University, Ile-Ife

Adeniyi, S.A. (2011). Effect of audit tenure and non-audit services on auditors'negligence. *Unpublished Master Thesis*. Department of Accountancy, Faculty of Management Sciences, Nnamdi Azikiwe University, Awka.

Adeoti, J.O. (2005). Information technology investment in Nigerian manufacturing industry: The progress so far, *selected papers for the 2004 annual conference, Nigerian Economic society*, Ibadan, 213 - 244

Adesina, A.A. & Ayo, C.K. (2010). An empirical investigation of the level ofusers' acceptance of e-banking in Nigeria,*Journal of internet banking and   commerce,15*(1), 35-41

Adewoye, J.O. (2007). Performance impacts of information technology (IT)Investmentsonbanking operations in South-Western Nigeria. *UnpublishedPh.D Thesis*LadokeAkintola University of Technology, Ogbomoso,

Adewoyin, A.O. (2013). Corporate governance and banking sector PerformanceInNigeria. *Unpublished Ph.D seminar paper*. Department of Bankingand Finance, Faculty of Management Sciences, NnamdiAzikiweUniversity, Awka.

Afolabi, Y.A. (1990). *Law and practice of banking*. Lagos: Top golden Nigeria Ltd; 32-36

Agboola, A. A. (2001) Impact of electronic banking on customer services in Lagos, Nigeria, *IfeJournal of Economics and Finance*, *5*(1 & 2)

Agboola, A. A. (2006). Information and communication technology (ICT) inbanking operations in Nigeria – An evaluation of recent experiences, *Journal of Electronic Commerce in Organizations*, 12(4)

Agboola, A. (2006). Information and communication technology (ICT) inBankingoperationsinNigeria: an evaluation of recent experiences, *Retrieved from internet on Feb., 12, 2013*.

Akuezuilo, E. O., &Agu, N. N. (2003).*Research and statistics in Educationandsocial sciences:Methods and applications.*Awka: NuelCentiPublishers and Academic Press Limited : 27-32

Akerele, W.O. (2000). Techno-managerial capability acquisition in small scaleenterprises in Nigeria: The case study of Metal Fabrication Enterprises in Oyo State. Ibadan: *NISER Monograph series7*.

Akinbami, A.F. (2001). Industrial clusters and innovations networks: A study offirms in South-Western and Northern Nigeria. *A final report submitted tothe African Technology Policy Studies (ATPS)*

Akintonde, O.G. (2013). Assessment of the performance of secretaries in information communication technology in Ondo State Civil Service.*Unpublished Master Thesis*.Department of Vocational Education, Faculty of Education, NnamdiAzikiwe University, Awka.

Al Ashban, A. & Burney, M.A. (2001). Customer adoption of tele-bankingtechnology: the caseof Saudi Arabia. *International Journal of Bank Marketing*, *19*(5): 191-201.

Aliyu, A.A. & Tasmin, R.B. (2012). The impact of information and communication technology on banks' performance and customer servicedelivery in the banking industry, *International journal of latest trends in Finance & Economic Sciences,2*(1), 80 - 90

Alu, A.D. (2002). Effect of information technology on customer services in theBankingindustryin Nigeria.*Journal of ICT 7*(4) 25-32

Anguelov, C. E., Higert, M.A., & Hogarth, J. M. (2004).*US consumers andelectronic bank*, *1995-2003*. USA: Federal Reserve Bulletin.

Arch, A. M. J., &Burmeister, O. K. (2003).E-banking technologies.*ITD Journal,9*(2): 7-8.

Asika, N. (1991). *Research methodology in the behavioural sciences.* Lagos:Longman Nigeria Plc. p40

Aubert, J. (2004). Promoting innovations in developing countries: A conceptualframework, *World Bank Institute*, July.

Aworemi, J.R. (2006). Comparative analysis of the performance of public andPrivatetransportcompanies in South-Western Nigeria.*Unpublished Ph.D Thesis,* LadokeAkintola University of Technology, Ogbomoso,

Ayadi, A. (2003). Technological and organizational preconditions to InternetBankingimplementation: case of Tunisia Bank.*Journal of Internet banking and Commerce*, *11*(11): 1-15.

Ayantoye, A.O. (2010). *Management accounting and economics dictionary*. Lagos: Greater concept media.

Bagozzi, R.P., Davis, F.D., & Warshw, P.R. (1992).Development and test of atheory of technology learning and usage. *Human Relations45*(7), 660-686

Barrow, C. (1997). *The business growth handbook*, Kogan page

Batanda, B.J. (2001). To love, hate the bank ATM. *Daily Monitor*, 11. April 11

Bechard, R. (1969). *Organization development strategies and models reading,* Addison-Wesley

Bell, M. (1982). Technology change in infant industries: A review of empiricalevidence. (Mimeo)*Science Policy Research Unit* (SPRU), University of Sussex, Brighton, UK.

Bell, M. (1993). Integrating R & D with industrial production and technicalchanges: Strengthening linkages and changing structures.*Science PolicyResearch Unit* (SPRU), University of Sussex, Brighton, UK.

Bell, M. &Pavit, K. (1993).Accumulating technology capability in developingcountries. Industrial and corporate change, *2*(2), 35–44

Bennis, W. (1969). Organization development: it's Nature, origin and prospects,Reading, Addition Wesley.

Berger, A.N. (2002). Economic effects of technological progress: evidence fromthe banking industry. *Journal of Money, Credit and Banking*, *35*(2),141-176.

Biggs, T., Shah, M., &Strivasteva, P. (1995). Technological capabilities andlearning in African enterprises. *World Bank Technical Paper* 288. Washington D.C.: The World Bank

Bill, G. (1996). *Banking on a High-Tech future*,Canterbury: Chartered Institute of Bankers Books, Emmanuel House; *2*(4)

Binuyo, A.O., & Aregbeshola, R.A. (2014). The impact of information andcommunication technology (ICT) on commercial bank performance: Evidence from South Africa; *Journal of Problems and Perspectives in Management,12*(3), 59-68

Bohm, N., Brown, I. &Gladman, B. (2000). Electronic Commerce: who carriesthe risk of fraud? *Journal of Information, Law and Technology*, *3*(1), 1

Bolle De Bal, M. (1992). *Organization development in Szell, G* (ed.) Conciseencyclopedia of participation and co-management, Berlin: Walter deGruyter

Bresnahan, K.W., Brynolfsson, E.&Hitt, L.M. (2002). Information technology,Workplaceorganization and the demand of skilled labour, firm levelevidence. *Quarter Journal of Economics117* (1), 338 − 376, February.

Brynjolfsson, E. &Hitt, L.M. (2000). Beyond computation: informationtechnology,organizational transformation and business performance. *Journal of Economic Perspectives*, *14*(4), 23-48.

Brynojolfsson, E. &Hitt, I. (1995). Is information system spending productive?New evidenceand new results.*Proceeding of the 14th internationalconference information systems, Orlando, Florida.*

Buys, M. & Brown, I. (2004).Customer satisfaction with Internet bankingwebsites: Anempirical test and validation of a measuring instrument.*Proceedings of the 2004 annual research*

conference of the South AfricanInstitute of Computer Scientists and Information Technologists on IT research in developing countries. Hosted by of the South African Institute of Computer Scientists and Information Technologists and held October 4-6, 2004 at Stellenbosch, Western Cape, South Africa.

Castells, M. (2001).*The Internet Galaxy: Reflections on the Internet, BusinessAndSociety*,Oxford; New York: Oxford University Press.

Central Bank of Nigeria, (2006).*Annual report and accounts*. Abuja: CentralBankof Nigeria

Central Bank of Nigeria, (2007).*CBN briefs 2006 – 2007*. Abuja: CBN researchandstatisticsdepartment.

Central Bank of Nigeria, (2007).*Annual report and accounts*. Abuja: CentralBank of Nigeria.

Central Bank of Nigeria, (2009).*Annual report and accounts*. Abuja: CentralBank of Nigeria.

Central Bank of Nigeria, (2010).*Annual report and accounts*. Abuja: CentralBank of Nigeria

Central Bank of Nigeria, (2010).*Statistical bulletin*. Abuja: Central bank of Nigeria. Vol. 21

Central Bank of Nigeria, (2011).*Statistical bulletin*. Abuja: Central bank of Nigeria. Vol. 22

Central Bank of Nigeria, (2011).*Annual report and accounts*. Abuja: CentralBank of Nigeria

Central Bank of Nigeria, (2012).*Annual report and accounts*. Abuja: CentralBank of Nigeria

Chorafas, D.N. (1998). *Electronic fund transfer*, London: ButterWorths.

Coombs, R.S.P. &Waish, V. (1987).*Economics and technological change*,London: Macmillan

Dauda, Y. A. (1997). Analysis of engineers and technicians performance in theachievement of company objectives in Ogun territory of the Nigerian telecommunications Limited, *Unpublishedseminar paper*, Faculty of Education, University of Ibadan.

Dauda, Y. A. (1998). Human resource management for performanceimprovement.*Nigerian telecommunications Journal, 21,* March.

Dauda, Y. A. (2000). Poverty alleviation process and employees' wellbeing ina democratized Nigeria. *Conference proceedings of the 3rd regionalcongress of The international Industrial Relations Association (IIRA)*University of Stellenbosch, South Africa

Dauda, Y. A. (2000). Investment in technological innovation and improvedproductivity of theNigerian telecommunication, *Unpublished PhD Thesis,* Faculty of Education, University of Ibadan, Nigeria.

Dauda, Y. A. (2003). Customer care in the Nigerian Telecommunicationssector,*The Guardian*, December 31st.

Dauda, Y. A. (2009). Privatization challenges and the globaltelecommunications industry:Implication for industrial relations inNigeria.*Nigerian Journal of Labour Law and Industrial Relations, 3(1)*March.

Dauda, Y. A. (2010). Technological innovation and organizational performance:employee relation strategies. *Nigerian Journal of Industrial Relations,11*,96-110

Dauda, Y.A. &Akingbade, W.A. (2011). Technology innovation and NigeriaBanksperformance: The assessment of employees and customersresponses. *American Journal of Social and Management Sciences2*(3)329 – 340.

Davilla, T., Epstein, M.J., & Shelton, R. (2006).*Making innovation work: Howto manage it, measure it, and profit from it.* Upper Saddle River: Wharton School Publishing.

Davis, F.D., Bagozzi, R.P., & Warshaw, P.R. (1989). User acceptance ofcomputer technology: A concept of two theoretical models.*Management Science,35*: 982-1003.

Delgado, J. & Nieto, M.J. (2004). Internet banking in Spain some stylized facts.

Moneytary integration, market and regulation, in Binuyo, A.O. and Aregbeshola, R.A. (2014). *Problems and Perspectives in Management,12*(3), 59-68

DeYoung, R. (2005). The performance of internet-based business models:Evidence from the banking industry, *Journal of Business*, *78*(3), 893-947

Drucker (1985). *Innovation and entrepreneurship: Practice and principle*, NewYork: Harper and Row publisher

Ehikhamenor,F. (2003). Information technology in Nigerian banks: The limitsof expectations, *Information Technology for Development*, *10*:13-24

Emmanuel, O.S. & Adebayo, A.A. (2011). ICT's service delivery andOperationalperformance in Nigeria banks: a survey of empiricalresearch. *African Research Review,AnInternational Multidisciplinary Journal, Ethiopia 5*(4), Serial 21, July, 44-59

European Central Bank (2010). Beyond ROE – How to measure bankperformance. *Accessed from internet on March 10,* 2015.

European Union States (2005). Official journal of the European Union*(http://gmo-crl.jrc.it/doc/2005-317-ec.pdf*) accessed from internet on Feb10, 2015

Ezeoha, A. E. (2005). Regulating internet banking in Nigeria: Problems andchallenges.*Journal of Internet Banking and Commerce*, *10*(3): 1-5.

Freeman, C. (1982). *The economics of industrial innovation*, (2nded.) London:Pinter Ltd.

Grainger–Smith, N. & Oppenheim, C. (1994). The role of information systemsandTechnology (IS/IT) in investment banks, *Journal of InformationScience*, *20*(5), 323 -333.

Greenhalgh, T., Robert, G., Macfarlane, F., Bate, P. & Kyriakidou, O. (2004).

Diffusion of innovations in service organisations: Systematic Reviewand Recommendations; *The Milbank Quarterly*, *82*: 581-629.

Gourlay, A.R. & Pentecost, E. J. (2002). Impact of network effects ontechnology adoption: evidence from the adoption of automated tellermachine, *Journal of Manchester school*, *70*(2): 185-203.

Hernando, I & Neito, M.J. (2007). Is the internet delivery channel changingbanks' performance? The case of Spanish banks, *Journal of Banking and Finance,31*(4), 1083-1099.

Hutchinson, D. & Warren, M. (2003).Security for Internet banking: Aframework.*JournalofLogistics Information Management*, *16*(1), 64-73.

Ibenta, S.N.O. (2008). *Research monograph: Guidelines for seminar papers,theses and project reports*, Lagos: African basic economy Limited.

Ibraheem, M.B. (2000). Effect of environment on information technologyindustry.*Unpublished Seminar paper,* Department of TPDU, ObafemiAwolowoUniversity, Ile-Ife.

Idowu, P.A.M., Alu, A.O. &Adagunodo, E.R. (2002). Effect of informationtechnology on thegrowth of the banking industry in Nigeria. *Electronic Journal on Information Systems in Developing Countries*, *10*(2), 1-8.available on: http://www-ejisdc.org

Ilori, M.O. (2002). Promoting technological innovation for the industrialdevelopment of Africa. *NISER Monograph Series*, *6*: 47-63

Ilori, M.O., Adeniyi, A.A., Sanni, S.A., Oyewale, A.A. &Irefin, I.A. (2002).Developing a manufacturing based economy in Nigeria through science and technology. *Technovation*, *22*: 51-60

Ilori, M.O. (2006).From innovation to technology management.*InauguralLecture series 191*. Ile-Ife: ObafemiAwolowo University Press ltd.

Irechukwu, G. (2000).*Enhancing the performance of banking operationsthrough appropriate information technology*. Ibadan: Spectrum Books,63-78.

Kajogbola, A. (1999). Technology business incubator: An assessment ofoperations for small scale enterprises development in Nigeria. *NISER Monograph series*, *23*

Karem, K. (2003). *Internet banking in Estonia*. Tallinn: TTU Press.

Karin, B., Laurie, L. A. & Dave, R. (2005).Evaluating the efficacy of creditcardregulation.*International Journal of Bank Marketing*, *23*(3): 237-254.

Kast, F.E. &Rosenzweig, J.E. (1979).*Organization and management: A systemand contingency approach*, New York: McGraw Hill Book co Inc.

Khalifa, C.A. (2000). *The impact of computers management*. Cambridge: Mass,MIT press

Khalil, T. (2000). Management of technology: The key to competitiveness andwealth creation, McGraw Hill.

Kothari, C.R. &Garg, G. (2014).*Research methodology* 3rded. New Delhi:New Age International (P) Ltd.

Kotler, P. (2003). *Marketing management, 12th edition*. Singapore: PearsonEducationPtc Ltd.

Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for researchactivities.*Educational and Psychological Measurement, 30:*607-610.

Land, F. (2000). Evolution in a social-technical context. IFIP WA52, Aalborg115 – 126

Laudon, D.P. &Laudon, J.P. (2001): *Management information systems:Organizationand technology in the network enterprises*, *4th ed.* U.S.:Prentice Hall International Inc.

Laudon, D.P. &Laudon, J. P. (2010). *Management information system:Managing the digital firm*, *11th ed.*, London: Pearson Education Ltd.

Loonam, M. &O'Loughlin, D. (2008).An observation analysis of e-servicequality in online banking.*Journal of Financial Services Marketing,13*(2): 164-178.

Luecke, R. & Katz, R. (2003).*Managing creativity innovation*. Boston, MA:Harvard Business School Press.

Lundvall, B.A. (1992). *National systems of innovation: Towards a theory ofinnovation and interactive learning*. London: Printer Publishers

Meyer, G. (2004). Diffusion methodology: Time to innovate? *Journal of Health Communication: International Perspectives9*(81) 61

Morris-Cotterill, N. (2004). Which e-banking initiatives have been successfulAndwhy.*Virtual conference on electronic banking for the poor.* Hostedby MicroSave and held February 16-27, at Nairobi, Kenya.

Namirembe, E. (2007). Influence of ICT on the banking industry: The case of Kampala.*M.Sc. computer science dissertation* Makerere University.

Nath, R., Schrick, P. &Parzinger, M. (2001).Bankers' perspectives on internetbanking.*E-Service Journal*, *1*(1): 21-36.

Nelson, R.R. (1993). *National innovation systems: A comparative analysis*. New York: Oxford University Press

Nigeria Deposit Insurance Corporation (2010). *Annual report and statement ofaccounts*. Abuja: Research, policy and international relations department.

Nnabuife, E. (2009). *Organizational behaviour and management theory*.Nimo,Anambra State, Nigeria: Rex Charles and Patrick Ltd. 253.

Nwankwo, G.O. (1980). *The Nigerian financial system*. London: Macmillanpublishers Ltd; 45-82

Nwude, C. (2005). Bank recapitalization: The imperatives, implications, optionsand strategies for banks. *The Nigerian Banker*, Jan – March: 6 - 17

Nwude, E.C. (2012). Benefits, challenges, and prospects of a cashless economy.*The Nigerian banker*. Jan – March: 5 – 13.

Obasan, K.A. (2011). Information and communication technology and banksprofitability in Nigeria.*Australian Journal of Business and ManagementResearch1*(4) 101 – 107, July

OECD (2003). *IT and economic growth – Evidence from OECD Countries*,Paris:Factories and Firms

OECD (2004).Information and communications technology – OECDInformation technology outlook 2004.*http://www.oecd.org/dataoecd/20/47/33951035.pdf*. Retrieved 28/9/2015.

Ojo, J.A.T. (2007). Financial Sector Maladaptation, Resource Curse andNigeria's DevelopmentDilemma*, Public Lecture*, Covenant University,Ota, OgunState, January 25.

Okafor, F.O. (2011). *50 years of banking sector reforms in Nigeria (1960-2010)Past lessons: Future imperatives*. Enugu: Ezu book Ltd: 11-26, 83-85

Okigbo, P.N.C. (1981). *Nigeria's financial system: Structure and growth*.United Kingdom: Longman group 75-116.

Oliveira, T. & Martins, M.F. (2011). Literature review of informationtechnology adoption models at firm level; *The Electronic Journal Information Systems Evaluation,14*(1), 110-121.

Organization for Economic Cooperation and Development. (2003). *Banking Competition inLatin America*. First meeting of Latin

American Forum.Hosted by Latin American Forum, April 7-8, in Paris.

Osabuohien, E. S. (2008). ICT and Nigerian banks reforms: analysis ofanticipated impacts in selected banks, *Global Journal of Business Research*,*2*(2): 67 – 76.

Ovia, J. (2002). Payment systems and financial innovation.*TheCentralBank ofNigeriaannual monetary policy conference,*November, 25th – 26th, Abuja.

Ovia, J. (2005). Enhancing the efficiency of the payment system in Nigeria.*CBN Bullion*, *29*(1), 8-18. January – March

Ovia, J. (2005). From banking hall to e-platform', *Financial Standard*, January15.

Oyebisi, T.O. &Agboola, A.A. (2003). The impact of environment on thegrowth of the Nigerian IT industry, *accessed from internet* on 12th February, 2014

Oyelaran-Oyeyinka, B. (1994). The management of technical change: The coalin Nigeria. *IDRC Report*

Oyelaran-Oyeyinka, B. (1996). The nature, dimension and determinants ofindustrial innovation. *NACETEM training course lecture on R&D andinnovation management,* OAU Ile-Ife

Oyelaran-Oyeyinka, B. &Lall, K. (2006).SMEs and new technologies.*Occasionalpapers*,Maastricht, United Nations University, The Netherlands

Pandey, I.M. (2010). *Financial Management* (10[th]ed.) New Delhi, India: VIIKAS Publishing House PVT Ltd. 108-167.

Rogers, E. M. (2003). *Diffusion of innovations 3rd ed.*. New York: Free Press.Retrieved from internet on 12/2/2015

Ryan, B.,& Gross, N. (1943). The diffusion of hybrid seed corn in two Iowacommunities; *Rural Sociology*, *8*(1)

Salawu, R. O. &Salawu, M. K. (2007). The emergence of internet banking inNigeria: Anappraisal.*Information Technology Journal*, *6*(4): 490-496.

Salkind, N.J. (2010). *Theencyclopedia of research design*. USA: Sage PublicationsIncorporated.Available online at:http://www.sagepub.com/view/researchdesign /n145.xml.

San-Jose, L., Ituralde, T., & Maseda, A. (2009). The influence of informationcommunications technology (ICT) on cash management and financial department performance: An explanatory model, *Canadian Journal ofAdministrative Sciences,26*(2), 150-169.

Santoro, M.D. &Chakrabarti, A.K. (2002).Firm size and technology centrality in industry – University interactions.*Research policy,* 31:163-118.

Schumpeter, J. (1934). *The theory of economic development.* Cambridge: Harvard University Press.

Singh, S., Chhatwal, S. S., Yahyabhay, T.M. &Heng, Y. C. (2001).DynamicsOfinnovationine-banking. *10th European conference on information systems,*organized by school of computing, University of Singapore,June 6-8, Gdansk, Poland.

Smith, K. (2005).*Measuring innovation*, the Oxford handbook of innovation.Oxford: Oxford University Press

Stanton, W.J., Etzel, M.J. & Walker, B.J. (2004).*Fundamentals of marketing*, *12thed.* New York: McGraw Hill, Inc.

Surry, D.W. & Farquhar, J.D. (1997).Diffusion theory and instructionaltechnology. *Journal ofinstructional science and technology*, *2*(1):1-14

Szymanski, K. &Ropetto, S.E. (2000). Does negative mood increase creativity?*convention for the American Psychological Association*

Takeda, Y. (1993). Managing technology for the 21st century, *ResearchTechnology management, 36*(6):8 -11 Nov/DecTaylor, O.W. (1993). Variables related to creativity and productivity amongmen in two related laboratories, *University of Utah creativity Research Report*

Woherem, E. W. (2000): *Information technology in the Nigerian bankingindustry*, Ibadan: Spectrum books.

Wucker, M. (2004). Remittances: The perpetual migration machine. *World Policy Journal*, *21*(2): 2.

Yasuharu, U. (2003). The effect of information system investments in bankingindustry, *accessed from internet* on 12th February, 2014

APPENDIX I

Financial Accounting Variables of Selected Commercial Banks in Nigeria from 2006-2013.

ACCESS BANK PLC

YR	PBT	PAT	DEP	ROA	ICT DEV	ICTMAIN	ASSETS	EPS
	₦'M	₦'M	₦'M	₦'M	₦'M	₦'M	₦'M	K
2006	1,119	737	110,879	5,237	1,277	27	174,553	7
2007	8,043	6,083	205,235	3,272	1,549	4	328,615	87
2008	19,042	16,056	351,789	6,457	2,542	4	1,031,842	99
2009	42	-2,088	405,836	11,349	3,616	5	647,575	-12
2010	17,669	7,727	440,542	3,577	6,264	2	726,961	44
2011	12,141	5,249	522,922	8,944	5,763	16	949,382	102
2012	36,259	35,816	1,093,979	12,588	10,264	2,922	1,515,754	157
2013	31,365	26,212	1,217,176	23,601	11,532	35	1,704,094	115

DIAMOND BANK PLC

YR	PBT	PAT	DEP	ROA	ICT DEV.	ICT MAIN	ASSETS	EPS
	₦'M	₦'M	₦'M	₦'M	₦'M	₦'M	₦'M	K
2006	5,292	3,849	144,569	2,136	4,871	12	223,048	57
2007	8,793	6,931	211,634	4,182	6,334	29	312,249	89
2008	15,059	11,822	403,710	3,563	9,042	42	603,326	110
2009	-9,056	-4,883	444,815	4,236	3,934	87	650,669	48
2010	9,468	6,522	375,733	96	2,881	8	548,402	45
2011	-27,132	22,868	545,161	51	2,214	163	714,063	-153
2012	28,365	23,073	823,091	281	2,881	6	1,059,137	159
2013	26,934	21,451	1,093,784	11,126	3,515	126	1,364,830	206

FIDELITY BANK PLC

YR	PBT	PAT	DEP	ROA	ICT DEV.	ICT MAIN	ASSETS	EPS
	₦'M	₦'M	₦'M	₦'M	₦'M	₦'M	₦'M	K
2006	3,587	3,162	78	1,811	3,198	1	120	19
2007	4,403	4,160	177	1.811	2,744	15	217	25
2008	15,796	12,987	379	2,634	6,607	38	533	45
2009	4,569	2,297	356	1,448	7,726	56	504	8
2010	8,324	5,827	327	724	5,812	13	478	20

YR	PBT	PAT	DEP	ROA	ICT DEV.	ICT MAIN	ASSETS	EPS
2011	8,222	5,960	561	4,055	6,596	38	739	21
2012	21,625	18,200	716	4,055	6,590	10	914	69
2013	9,028	7,721	806	6,084	8,252	7	1,081	27

FIRST BANK PLC

YR	PBT	PAT	DEP	ROA	ICT DEV.	ICT MAIN	ASSETS	EPS
	N'M	N'M	N'M	N'M	N'M	N'M	N'M	K
2006	16,128	12,350	390,846	5,238	12,842	35	538,145	269
2007	22,097	18,355	581,827	10,477	24,715	400	762,881	156
2008	38,020	30,473	661,624	19,890	9,074	1	1,165,461	223
2009	46,110	35,074	1,071,836	28,059	10,332	135	1,667,422	141
2010	33,537	32,123	1,328,218	26,105	12,735	1,717	2,037,209	98
2011	39,672	23,052	1,784,490	19,579	13,170	93	2,471,438	145
2012	93,921	76,801	2,171,807	27,105	16,438	80	2,770,674	238
2013	91,337	70,631	2,933,821	35,895	13,246	128	3,800,874	216

FIRST CITY MONUMENT BANK   PLC

YR	PBT	PAT	DEP	ROA	ICT DEV.	ICT MAIN	ASSETS	EPS
	N'M	N'M	N'M	N'M	N'M	N'M	N'M	K
2006	3,640	2,841	70,297	1,236	1,009	2	106,611	36
2007	7,390	5,806	187,991	3,326	2,478	42	262,806	61
2008	18,437	13,720	251,580	7,236	3,184	9	465,211	123
2009	3,979	3,467	322,419	107	5,636	2	460,081	21
2010	7,565	7,322	334,898	1,361	4,161	2	530,073	45
2011	-13,837	-11,688	410,679	4,216	5,094	13	683,273	-71
2012	-10,682	-9,244	644,268	5,423	7,983	92	890,314	-66
2013	6,088	6,028	646,217	7,345	8,807		1,031,482	30

GUARANTY TRUST BANK PLC

YR	PBT	PAT	DEP	ROA	ICT DEV.	ICT MAIN	ASSETS	EPS
	N'M	N'M	N'M	N'M	N'M	N'M	N'M	K
2006	10,025	7,905	212,834	5,700	2,367	23	304,580	95
2007	15,350	13,013	290,792	6,200	4,493	34	478,363	104
2008	27,199	21,490	357,006	7,420	8,239	18	714,345	173
2009	36,103	30,777	651,146	2,332	10,266	10	1,019,911	165
2010	45,511	38,412	711,039	2,915	11,528	70	1,083,304	165
2011	64,745	51,653	962,486	2,137	4,499	14	1,520,027	177

YR	PBT	PAT	DEP	ROA	ICT DEV.	ICT MAIN	ASSETS	EPS
2012	100,142	85,264	1,054,122	1,195	5,609	3	1,620,317	290
2013	100,462	85,545	1,261,927	1,362	6,640	5	1,904,366	291

SKYE BANK PLC

YR	PBT	PAT	DEP	ROA	ICT DEV.	ICT MAIN	ASSETS	EPS
	₦'M	₦'M	₦'M	₦'M	₦'M	₦'M	₦'M	K
2006	2,089	2,465	125,471	2,147	2,273	12	174,197	33
2007	7,519	5,517	269,316	4,211	3,805	1	446,114	74
2008	20,425	15,126	501,594	5,731	6,460	489	784,878	73
2009	2,148	1,130	452,918	4,241	9,204	21	622,164	10
2010	11,445	9,308	471,011	8,537	10,328	2	674,064	70
2011	2,977	2,627	645,747	9,421	11,190	6	876,527	90
2012	15,775	12,697	786,960	6,341	9,338	156	1,071,311	87
2013	17,058	15,865	819,736	5,319	10,052	106	1,114,009	75

STANBIC-IBTC BANK PLC

YR	PBT	PAT	DEP	ROA	ICT DEV.	ICT MAIN	ASSETS	EPS
	₦'M	₦'M	₦'M	₦'M	₦'M	₦'M	₦'M	K
2006	5,418	4,124	57,073	2,411	319	26	110,782	4
2007	8,796	6,942	72,455	3,218	1,056	104	304,519	6
2008	10,542	9,214	98,891	4,687	1,554	88	345,731	52
2009	7,141	6,258	170,411	7,500	3,408	176	331,796	-53
2010	10,187	7,811	187,595	7,313	4,990	27	372,612	33
2011	5,994	4,048	295,905	1,875	5,024	388	542,272	35
2012	9,976	6,643	382,051	4,245	6,572	287	387,218	44
2013	8,216	8,332	468,038	8,778	6,647	254	362,619	52

STERLING BANK PLC

YR	PBT	PAT	DEP	ROA	ICT DEV.	ICT MAIN	ASSETS	EPS
	₦'M	₦'M	₦'M	₦'M	₦'M	₦'M	₦'M	K
2006	728	1,073	75,026	15	2,142	18	109,664	2
2007	2,226	1,938	106,933	21	2,566	15	145,974	6
2008	7,789	6,523	184,730	21	2,856	20	236,502	52
2009	-9,073	-6,660	160,470	750	3,337	50	205,640	-53
2010	3,688	4,178	199,274	1,206	3,548	2	259,580	33
2011	3,460	4,644	409,794	1,570	6,118	3	504,048	35
2012	7,500	6,953	463,726	3,140	6,619	3	580,226	44
2013	9,310	8,275	570,511	3,785	7,838	32	707,797	52

UNITED BANK FOR AFRICA PLC

YR	PBT	PAT	DEP	ROA	ICT DEV.	ICT MAIN	ASSETS	EPS
	₦'M	₦'M	₦'M	₦'M	₦'M	₦'M	₦'M	K
2006	12,514	11,468	757,407	1,836	18,808	20	884,137	186
2007	28,615	19,831	897,651	7,060	24,590	28	1,102,348	261
2008	54,637	40,002	1,258,035	2,874	34,667	330	1,520,093	311
2009	22,989	12,889	1,151,086	1,325	42,310	51	1,400,879	10
2010	-8,194	-6,295	1,120,566	1,293	46,829	50	1,440,724	3
2011	-26,468	7,966	1,216,511	1,335	41,338	46	1,666,053	-20
2012	50,909	47,375	1,461,131	16,491	46,707	47	1,933,065	106
2013	51,841	46,483	1,797,376	16,500	41,064	295	2,217,417	115

UNITY BANK PLC

YR	PBT	PAT	DEP	R0A	ICT DEV.	ICT MAIN	ASSETS	EPS
	₦'M	₦'M	₦'M	₦'M	₦'M	₦'M	₦'M	K
2006	2,377	1,370	79,683	2,317	6,897	24	131,032	3
2007	1,464	721	145,794	3375	8,083	12	203,234	5
2008	-21,767	-13,245	320,140	5,472	8,920	2	364,081	-1
2009	-20,970	-15,855	214,820	4,536	11,535	168	256,798	-1
2010	13,314	12,415	222,145	3,217	12,696	36	305,221	37
2011	3,077	2,434	266,877	1,664	13,776	20	373,859	7
2012	6,456	6,180	270,060	2,132	14,319	125	395,720	18
2013	-33,639	-22,582	303,270	4,456	16,117	23	403,629	-56

WEMA BANK PLC

YR	PBT	PAT	DEP	ROA	ICT DEV.	ICT MAIN	ASSETS	EPS
	₦'M	₦'M	₦'M	₦'M	₦'M	₦'M	₦'M	K
2006	-7,200	-6,601	85,605	1,117	2,617	16	120,109	-66
2007	1,878	2,554	125,475	2,102	3,076	23	165,081	25
2008	-19,436	-11,668	108,907	45	3,816	12	110,981	-116
2009	-3,309	-2,094	94,791	126	3,912	9	142,785	-21
2010	12,964	16,238	12,507	926	4,177	8	203,144	154
2011	-7,649	-8,116	147,387	126	4,394	28	222,238	-63
2012	-4,942	-5,040	174,302	478	3,844	8	245,704	-26
2013	1,947	1,596	217,734	1,638	4,638	48	330,872	25

ZENITH BANK PLC

YR	PBT	PAT	DEP	ROA	ICT DEV.	ICT MAIN	ASSETS	EPS
	₦'M	₦'M	₦'M	₦'M	₦'M	₦'M	₦'M	K
2006	15,154	11,490	392,863	4,200	3,895	84	610,769	124
2007	23,289	17,509	568,012	6,600	5,508	56	883,941	105
2008	48,940	46,525	1,161,475	9,265	8,528	27	1,680,032	185
2009	31,753	18,365	1,114,271	11,303	16,816	23	1,573,196	58
2010	42,957	33,335	1,290,014	26,687	18,055	5	1,798,679	106
2011	57,144	41,301	1,577,290	29,827	19,012	16	2,169,073	211
2012	94,048	95,803	1,802,008	50,234	19,937	32	2,436,886	226
2013	94,108	83,414	2,079,862	54,944	21,394	18	2,878,693	257

Appendix II
Performance Variables of Sampled Money Deposit Banks for 2006 - 2013

Bank	Year	PBT (N'M)	PAT (N'M)	DEP (N'M)	ROA (N'M)	ICT DEV. (N'M)	ICT MAIN (N'M)	ICT INVST (N'M)
Access	2006	1119	737	110879	5237	1277	27	7.0000
Diamond	2006	5292	3849	144569	2136	4871	12	57.0000
Fidelity	2006	3587	3162	78	1811	3198	1	19.0000
Firstbank plc	2006	16128	12350	390846	5238	12842	35	269.0000
FCMB	2006	3640	2841	70297	1236	1009	2	36.0000
GTB	2006	10025	7905	212834	5700	2367	23	95.0000
Skye bank	2006	2,089	2465	125471	2147	2273	12	33.0000
Stanbic-IBTC bank	2006	5,418	4124	57073	2411	319	26	4.0000
Sterling bank plc	2006	728	1073	75026	15	2142	18	2.0000
UBA	2006	12,514	11468	757407	1836	18808	20	186.0000
Unity bank	2006	2,377	1370	79683	2317	6897	24	3.0000
wema bank	2006	-7,200	6601	85605	1117	2617	16	-66.0000
Zenith	2006	15,154	11490	392863	4200	3895	84	124.0000
Mean	**2006**	**5,452**	**5,341**	**192,510**	**2,723**	**4,809**	**23**	**59**
Access	2007	8043	6083	205,235	3272	1549	4	87
Diamond	2007	8793	6931	211634	4182	6334	29	89.0000
Fidelity	2007	4403	4160	177	1811	2744	15	25.0000
Firstbank plc	2007	22097	18355	581827	10477	24715	400	156.0000
FCMB	2007	7320	5806	187991	3326	2478	42	61.0000
GTB	2007	15350	13013	290792	6200	4493	34	104.0000
Skye bank	2007	7,519	5517	269316	4211	3805	1	74.0000
Stanbic-IBTC bank	2007	8,796	6942	72455		1056	104	6.0000
Sterling bank plc	2007	2,226	1938	106933	21	2566	15	6.0000
UBA	2007	28,615	19831	897651	7060	24590	28	261.0000
Unity bank	2007	1,464	721	145794	3375	8083	12	5.0000
wema bank	2007	1,878	2554	125475	2102	3076	23	25.0000
Zenith	2007	23,289	11490	392863	4200	3895	84	124.0000
Mean	**2007**	**10,753**	**7,949**	**268,319**	**4,186**	**6,876**	**61**	**79**
Access	2008	19,042	16056	351789	6457	2542	4	99.0000
Diamond	2008	15059	11822	403710	3563	9042	42	110.0000
Fidelity	2008	15796	12987	379	2634	6607	38	45.0000
Firstbank plc	2008	38020	30473	661624	19890	9074	1	223.0000
FCMB	2008	18437	13720	251580	7236	3184	9	123.0000
GTB	2008	27199	21490	357006	7420	8239	18	173.0000
Skye bank	2008	20,425	15126	501594	5731	6460	489	73.0000
Stanbic-IBTC bank	2008	10,542	9214	98891	4687	1554	88	52.0000
Sterling bank plc	2008	7,789	6523	184730	21	2856	20	52.0000

Bank	Year							
UBA	2008	54,637	40002	1258035	2874	34667	330	311.0000
Unity bank	2008	-21,767	-13245	320140	5472	8920	2	-1.0000
wema bank	2008	-19,436	-11668	108907	45	3816	12	-116.000
Zenith	2008	48,940	46525	1161475	9265	8528	27	185.0000
Mean	2008	18,053	15,310	435,374	5,792	8,115	83	102
Access	2009	42	-2088	405836	11349	3616	5	-12.0000
Diamond	2009	-9056	-4883	444815	4236	3934	87	48.0000
Fidelity	2009	4569	2297	356	1448	7726	56	8.0000
Firstbank plc	2009	46110	35074	1071836	28059	10332	135	141.0000
FCMB	2009	3979	3467	322419	107	5636	2	21.0000
GTB	2009	36103	30777	651146	2332	10266	10	165.0000
Skye bank	2009	2,148	1130	452918	4241	9204	21	10.0000
Stanbic-IBTC	2009	7,141	6258	170411	7500	3408	176	-53.0000
Sterling bank plc	2009	-9,073	-6660	160470	750	3337	50	-53.0000
UBA	2009	22,989	12889	1151086	1325	42310	51	10.0000
Unity bank	2009	-20,970	-15855	214820	4536	11535	168	-1.0000
wema bank	2009	-3,309	-2094	94791	126	3912	9	-21.0000
Zenith	2009	31,753	18365	1114271	11303	16816	23	58.0000
Mean	2009	8,648	6,052	481,167	5,947	10,156	61	25
Access	2010	17,669	7727	440542	3577	6264	2	44.0000
Diamond	2010	9468	6522	375733	96	2881	8	45.0000
Fidelity	2010	8324	5827	327	724	5812	13	20.0000
Firstbank plc	2010	33537	32123	1328218	26105	12735	1717	98.0000
FCMB	2010	7565	7322	334898	1361	4161	2	45.0000
GTB	2010	45511	38412	711039	2915	11528	70	165.0000
Skye bank	2010	11,445	9308	471011	8537	10328	2	70.0000
Stanbic-IBTC bank	2010	10,187	7811	187595	7313	4990	27	33.0000
Sterling bank plc	2010	3,688	4178	199274	1206	3548	2	33.0000
UBA	2010	-8,194	-6295	1120566	1293	46829	50	3.0000
Unity bank	2010	13,314	12415	222145	3217	12696	36	37.0000
wema bank	2010	12,964	16238	12507	426	4177	8	154.0000
Zenith	2010	42,957	33335	1290014	26687	18055	5	106.0000
Mean	2010	16,033	13,456	514,913	6,420	11,077	149	66
Access	2011	12,141	5249	522922	8944	5763	16	102.0000
Diamond	2011	-27132	22868	545161	51	2214	163	-153.000
Fidelity	2011	8222	5960	561	4055	6596	38	21.0000
Firstbank plc	2011	39672	23052	1784490	19579	13170	93	145.0000
FCMB	2011	-13837	-11688	410679	4216	5094	13	-71.0000
GTB	2011	64745	51653	962486	2137	4499	14	177.0000
Skye bank	2011	2,977	2627	64547	9421	11190	6	90.0000
Stanbic-IBTC bank	2011	5,994	4048	295905	1875	5024	388	35.0000

Sterling bank plc	2011	3,460	4644	409794	1570	6118	3	35.0000
UBA	2011	-26,468	7966	1216511	1335	41338	46	-20.0000
Unity bank	2011	3,077	2434	266877	1664	13776	20	7.0000
wema bank	2011	-7,649	-8116	147387	126	4394	28	-63.0000
Zenith	2011	57,144	41301	1577290	29827	19012	16	211.0000
Mean	2011	9,411	11,692	631,124	6,523	10,630	65	40
Access	2012	36259	35816	1093979	12588	10264	2922	157
Diamond	2012	28365	23073	823091	281	2881	6	159.0000
Fidelity	2012	21625	18200	716	4055	6590	10	69.0000
Firstbank plc	2012	93921	76801	2171807	27105	16438	80	238.0000
FCMB	2012	-10682	-9244	644268	5423	7983	92	-66.0000
GTB	2012	100142	85264	1054122	1195	5609	3	290.0000
Skye bank	2012	15,775	12697	786960	6241	9338	156	87.0000
Stanbic-IBTC bank	2012	9,976	6643	382051	4245	6572	287	44.0000
Sterling bank plc	2012	7,500	6953	463726	3140	6619	3	44.0000
UBA	2012	50,909	47375	1461131	16491	46707	47	106.0000
Unity bank	2012	6,456	6180	270060	2132	14319	125	18.0000
wema bank	2012	-4,942	-5040	174302	478	3844	8	-26.0000
Zenith	2012	94,048	95803	1802008	50234	19937	32	226.0000
Mean	2012	34,566	30,809	856,017	10,278	12,085	290	104
Access	2013	31365	26212	1217176	23601	11532	35	115
Diamond	2013	26934	21451	1093784	11126	3515	126	206.0000
Fidelity	2013	9028	7721	806	6084	8252	7	27.0000
Firstbank plc	2013	91337	70631	2933821	35895	13246	128	216.0000
FCMB	2013	6088	6028	646217	7345	8807	42	30.0000
GTB	2013	100462	85264	1054122	1195	5609	3	290.0000
Skye bank	2013	17,058	15865	819736	5319	10052	106	95.0000
Stanbic-IBTC bank	2013	8,216	8332	468038	8778	6647	254	52.0000
Sterling bank plc	2013	9,310	8275	570511	3785	7838	32	52.0000
UBA	2013	51,841	46483	1797376	16500	41064	295	115.0000
Unity bank	2013	-33,639	-22582	303270	4456	16117	23	-56.0000
wema bank	2013	1,947	1596	217734	1638	4638	48	25.0000
Zenith	2013	94,108	83414	2079862	54944	21394	18	257.0000
Mean	2013	31850.38	27591.54	1015573	13897.38	12208.54	85.92308	109.5385

Source: Audited Annual Report and Accounts of Selected Commercial Banks in
      Nigeria from 2006-2013

APPENDIX III

Mean of the Performance of 13 selected deposit money banks in Nigeria (2006-2013)

Year	PBT (N'M)	PAT (N'M)	DEP (N'M)	ROA (N'M)	ICT DEV. (N'M)	ICT MAIN (N'M)	EPS (K)
2006	5451.615	5341.154	192510.1	2723.154	4808.846	23.07692	59.15385
2007	10753.31	7949.308	268318.7	4186.417	6875.692	60.84615	78.69231
2008	18052.54	15309.62	435373.8	5791.923	8114.538	83.07692	102.2308
2009	8648.154	6052.077	481167.3	5947.077	10156.31	61	24.69231
2010	16033.46	13455.62	514913	6419.769	11077.23	149.3846	65.61538
2011	9411.231	11692.15	631123.8	6523.077	10629.85	64.92308	39.69231
2012	34565.54	30809.31	856017	10277.54	12084.69	290.0769	103.5385
2013	31850.38	27591.54	1015573	13897.38	12208.54	85.92308	109.5385

Source: Excel computation of Input Data.